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

December 17, 1997

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlman:

Subject: Perchlorate Consent Agreement

Kerr-McGee Chemical Corporation (KMCC) received a request from Lew Dodgion to work towards development of a Consent Agreement to cover activities associated with investigation of perchlorate impact at KMCC's Henderson, Nevada, facility

Mr. Dodgion provided a template Consent Agreement which he requested that KMCC review and return to NDEP with comments. Attached is a redline version of that original template with modification noted. New text is underlined; removed text is struck out.

In addition, there are two sections which will need consideration and probable modification. KMCC was reluctant to modify these without prior discussion with NDEP. These sections are:

- Section V, Paragraph 2 - Public Participation.
  Section V, Paragraph 2 discusses the method of ensuring the public is informed and that they have opportunity for comment. NDEP will need to consider how this is done. Current text explains that the information exchange will occur in conjunction with the Public Involvement Plan, a part of the BMI Common Areas Phase 2 Consent Agreement. This may be the most effective process, but this determination should be made.

- Section XVII - Reimbursement of Division Oversight Costs.
  Section XVII discusses the method for reimbursement of NDEP costs associated with assessment of perchlorate impact at Henderson, Nevada. KMCC does not believe that inclusion of these costs in the HISSC Phase II reimbursement invoices is appropriate. A determination will be required to develop an appropriate means for Division reimbursement.

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,

Susan M. Crowley
Staff Environmental Specialist

By certified mail
cc: PSCorbett
PBDizikes
ALDooley
RHJones
Robert Kelso (NDEP)
J. Reichenberger
Doug Zimmerman (NDEP)

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CONSENT AGREEMENT

This Consent Agreement (the "Consent Agreement") is made and entered into this ~~1st~~ ____ day of ~~August~~ _____, 199~~6~~__, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection (the "Division") and Kerr-McGee Chemical Corporation (the "Company"). The Company and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Division is designated as the state water pollution control agency for Nevada and is empowered to administer and enforce the Nevada Water Pollution Control Law, Nevada Revised Statutes ("NRS") §§ 445.131 to 445.354, inclusive; and

WHEREAS, the Division is designated as the state agency for the regulation of hazardous waste and is empowered to administer and enforce the Nevada Hazardous Waste Disposal Law, NRS §§ 459.400 to 459.600, inclusive; and

WHEREAS, in March 1997, the State of California developed a method of analysis of drinking water supplies for the presence of "perchlorate" at levels much lower than historically had been the norm (parts per billion in contrast to parts per million) and

application of this new method has indicated the presence of perchlorate at the parts-per-billion level in Lake Mead and the Colorado River Basin;

WHEREAS, perchlorate has not heretofore been included on lists of hazardous substances or of hazardous constituents developed by the federal Environmental Protection Agency ("EPA"), and its human health effects are not understood, and accordingly, concerned parties including EPA , the State of Nevada and present and historical manufacturers of ammonium perchlorate, a rocket fuel, are seeking to improve toxicological information regarding perchlorate, improve analytical protocols, and find technological and regulatory solutions to the potential problem of perchlorate in public drinking water supplies;

WHEREAS, the Company has since 1968 owned and operated a plant at Henderson, Nevada used to produce ammonium perchlorate, which same facility was previously operated by the United States Navy and others to manufacture perchlorate products, including sodium perchlorate and potassium perchlorate;

WHEREAS, in Henderson, to the northwest of the Company's facility, ammonium perchlorate was manufactured for approximately 30 years by Pacific Engineering and Production Co. of Nevada (PEPCON);

WHEREAS, sampling of groundwater at the Company's and PEPCON's sites and in areas to the north and east of these

facilities approaching the Las Vegas Wash indicates elevated levels of perchlorate in groundwater which are presumptively associated with historical operations at the Company's and PEPCON's facilities;

~~**WHEREAS**, the Division has communicated to the Company its intention to require the investigation, characterization and, if necessary, remediation of Releases at or associated with the Site which may pose a threat to human health, welfare, or the Environment resulting from industrial operations and Environmental Contaminant management activities at or associated with the Company's Site, and~~

WHEREAS, the Division has communicated to the Company and PEPCON its intention to require the investigation, characterization and, if necessary and feasible, remediation of Releases of perchlorate at or associated with these two sites which may pose a threat to human health, welfare or the environment;

~~**WHEREAS**, the Company desires to cooperate fully with the Division to investigate, characterize and, if necessary, remediate in a prompt and satisfactory manner Releases at or associated with the Site which may pose a threat to human health, welfare, or the Environment, and~~

WHEREAS, the Company desires to cooperate fully with the Division to investigate, characterize and, if necessary and

feasible, remediate in a prompt and satisfactory manner releases of perchlorate at or associated with the Site which may pose a threat to human health, welfare or the environment and agrees that these steps should take place pursuant to this agreement, while taking due account of, and where necessary and appropriate coordinating with, other environmental response activities ongoing at Henderson, including: (1) the Company's Phase II consent agreement of August 1, 1996, with the Division governing investigation and remedial planning with regard to other releases of "Environmental Contaminants" at or associated with the Company's site; (2) the Phase II consent agreement of February 23, 1996, between the Division, Montrose Chemical Corporation of California, Inc., Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, Titanium Metals Corporation, Basic Management, Inc. and the Company, regarding releases of "Environmental Contaminants" at or associated with the Basic Management, Inc. Industrial Complex; and (3) any consent agreement addressing release of perchlorate that the Division may achieve with PEPCON.

~~**WHEREAS**, on April 25, 1991, the Division and Chemstar, Inc., Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Inc., Pioneer Chlor Alkali Company, Inc., Stauffer Management Company and Titanium Metals Corporation entered into a consent agreement ("Phase 1 Consent Agreement") regarding the first phase of a contemplated phased approach to the assessment~~

and remediation, if necessary, of Environmental conditions at or associated with the BMI Complex, consisting of the following three phases: Phase 1 -- the development of Phase 1 environmental conditions assessment reports detailing information regarding the BMI Complex, Phase 2 -- if determined by the Division to be necessary to protect human health, welfare, or the Environment, the performance of environmental investigations to fill in any data gaps identified by the Phase 1 reports, Phase 3 -- if determined by the Division to be necessary to protect human health, welfare, or the Environment, identification and implementation of appropriate remedial measures to address environmental conditions identified in Phases 1 and 2, and

WHEREAS, pursuant to the Phase 1 Consent Agreement, the Company which signed the Phase I Consent Agreement submitted to the Division on April 14, 1993. Phase I Environmental Conditions Assessment for the Kerr-McGee Chemical Corporation Henderson, Nevada Facility ("Phase 1 Report"), and

WHEREAS, the Division has determined, based upon its review of the Phase 1 Report, that additional work is necessary to gather additional information and data concerning the Site. Those areas or issues for which the Division requires the Company to evaluate and characterize the nature and extent of Releases within or associated with the Site were finalized in a Letter of Understanding dated August 15, 1994, which is attached hereto as Attachment A. Through this Consent Agreement the

~~Company, if required by the Division, shall commence the process of developing and evaluating appropriate remedial alternatives, and~~

WHEREAS, the Division and the Company have agreed to enter into this Consent Agreement regarding such ~~additional~~ work.

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

I. DEFINITIONS

The following terms shall have the meanings specified for purposes of this Consent Agreement:

1. Administrator means the Administrator of the Nevada Division of Environmental Protection.

~~2. BMI means Basic Management, Inc.~~

~~3. BMI Company or BMI Companies means BMI, Kerr-McGee Chemical Corporation, Pioneer Chlor-Alkali Company, Inc.[1/], and Titanium Metals Corporation, individually or collectively, respectively, or their respective successors or assigns with respect to ownership or~~

[1/] In 1988, Pioneer Chlor-Alkali Company, Inc. became the owner and operator of certain real property and improvements located at the BMI Complex which, during an earlier time period, had been owned and operated by Stauffer Chemical Company. Stauffer Management Company neither owns nor operates any real property or improvements located at the BMI Complex.

~~operation of any portion of the Site or the BMI Complex.~~

2.~~4.~~ BMI Common Areas Phase 2 Consent Agreement means the Consent Agreement made and entered into on February 23, 1996, by and among the Division and Kerr-McGee Chemical Corporation, Montrose Chemical Corporation of California, Inc., Pioneer Chlor Alkali Company, Inc., Stauffer Management Company, Titanium Metals Corporation and Basic Management, Inc.

3.~~5~~. BMI Complex means the Basic Management, Inc. Industrial Complex located in Clark County, Nevada, and includes all land, structures, other appurtenances, and improvements on the land owned or operated as of April 15, 1993 by the BMI Companies or any of them, or Montrose Chemical Corporation of California, Inc., except those properties identified in letters from BMI to the Division dated November 1, 1991 (acknowledged January 23, 1992), and April 9, 1992 (acknowledged June 19, 1992), respectively, attached hereto as Attachment B.

4.~~6.~~ Company means Kerr-McGee Chemical Corporation.

5.~~7.~~ Consent Agreement means this Consent Agreement and includes all attachments, Division-approved ~~w~~Workplans (including schedules and attachments), Division-approved Deliverables, amendments, modifications and

items incorporated by reference as provided in Section XXVIII.

6.~~8.~~ Contractor means any entity or person, including any contractor, subcontractor, consultant, firm or laboratory, retained by the Company or the Division to conduct or monitor any portion of the work performed pursuant to this Consent Agreement.

7.~~9.~~ Deliverable means, without limitation, any ~~w~~Workplan, report, progress report, plan, data, document, information, submittal, obligation or work which the Company is required to submit to the Division under the terms of this Consent Agreement.

8.~~10.~~ Division means the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection, or its successor department or agency of the State of Nevada.

9.~~11.~~ Effective Date means the date on which this Consent Agreement becomes effective, as specified in Section XXIX. The effective period of this Consent Agreement means the period of time between the Effective Date and the date upon which this Consent Agreement terminates as specified in Section XXX.

10.~~12.~~ Environment means air, land (including subsurface strata), and water (including groundwater) or any combination or part thereof.

13. Environmental Contaminant means any element, compound, mixture, solution or substance, the Release of which may present a substantial endangerment to human health, welfare, or the Environment regulated by the Division under any applicable Environmental Law including, without limitation, any "solid waste," "hazardous waste," "hazardous constituent," "hazardous substance," "regulated substance," "pollutant," "contaminant," "radioactive material," "air contaminant," "imminently hazardous chemical substance or mixture," "hazardous material," or other substance so defined by any applicable Environmental Law.

14. Environmental Law means each federal and state law and regulation relating in any way to Environmental pollution or the protection of the Environment or the Release of any Environmental Contaminant into the Environment including, without limitation, the Nevada Water Pollution Control Law, NRS §§ 445.131 to 445.354, the Nevada Solid Waste Disposal Law, NRS §§ 444.440 to 444.650, the Nevada Hazardous Waste Disposal Law, NRS §§ 459.400 to 459.600, the Nevada Air Pollution Control Law, NRS §§ 445.401 to 445.710, the Nevada Underground Storage Tank Law, NRS §§ 459.800 to 459.856, the Nevada Radiation Control Law, NRS §§ 459.010 to 459.290, the Clean Air Act, 42 U.S.C. §§ 7401 7671q, the Federal

~~Water Pollution Control Act, 33 U.S.C. §§ 1251-1387, the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k, the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675, and the Toxic Substances Control Act, 15 U.S.C. §§ 2601-2692, each as may be amended from time to time, and including the implementing regulations promulgated respectively thereunder.~~

11.~~15.~~ EPA means the United States Environmental Protection Agency or its successor department or agency.

12.~~16.~~ NAC means the Nevada Administrative Code or its successor codification of rules and regulations.

13.~~17.~~ NRS means the Nevada Revised Statutes or its successor codification.

14.~~18.~~ Receptor means any appropriate and representative population, community or habitat of any biological organism (including humans, animals and plants) which is or may be affected by Releases of ~~Environmental Contaminants~~ perchlorate at or associated with the Site.

15.~~19.~~ Release means any past or present spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, migrating,

dumping, or disposing of ~~any Environmental Contaminant~~ perchlorate into the Environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any perchlorate~~Environmental Contaminant~~).

16.~~20.~~ Site means all land, structures, other appurtenances, and improvements on the land located at that portion of the BMI Complex, as more particularly described in Attachment ~~C~~A.

17.~~21.~~ State means the State of Nevada, including, as appropriate, its agencies, departments, political subdivisions, agents and employees.

~~22. Study Item means the location of each Release, waste management unit or facility, Environmental Contaminant source, or issue of concern at or associated with the Site which is either identified in Attachment A as a Study Item or an area of additional work under Section IV(D) (Additional, Alternative or Accelerated Work).~~

II. STATEMENT OF PURPOSE

In entering into this Consent Agreement, the mutual objectives of the Division and the Company are: (1) to perform ~~an Environmental~~a Perchlorate Conditions Investigation of perchlorate contamination as described in Section IV.A; ~~(2) to address the post-closure permitting requirements of the federal~~

~~Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (42 U.S.C. §§ 6901-6992k) and the Nevada Hazardous Waste Disposal Law (NRS §§ 459.400 to 459.600), and the regulations promulgated respectively thereunder, as required for a RCRA regulated site,~~ and (2~~3~~) to perform such Remedial Alternative Study(ies), or Interim Remedial Measures ~~or Additional Work~~ as provided in Section IV. The Parties intend that the work to be performed in accordance with Section IV (including all approved ~~w~~Workplans), and accepted by the Division, will be consistent with the National Contingency Plan, 40 C.F.R. § 300.1 et seq.

III. PARTIES BOUND

1. The provisions of this Consent Agreement shall apply to and be binding upon the Division, including the Department of Conservation and Natural Resources (the "Department"), and upon the Company, its successors and assigns.

2. In 1998 Kerr-McGee Chemical Corporation will be merged into Kerr-McGee Chemical LLC. This merger and change of name will in no way alter the Company's responsibilities under this Consent Agreement. The Company has signed an agreement for sale of its ammonium perchlorate business to PEPCON. No conveyance of real property interest in the Site will result should this sale become effective. Any change in ownership or corporate or partnership status of the Company and any conveyance of title,

easement, or other real property interest in the Site, or a portion of the Site, shall in no way alter the Company's responsibilities under this Consent Agreement. In the event that the Company proposes to sell or transfer all or a portion of the Site, or any real property subject to this Consent Agreement, such Company shall, prior to such sale or transfer, provide written notice to such purchaser or transferee of the existence and terms of this Consent Agreement and any ~~Environmental~~ Perchlorate Conditions Investigation, and shall provide written notice to the Division concerning the sale or transfer not later than fifteen (15) days after such sale or transfer. Such Company shall also obtain, and provide to the Division a copy of, a written undertaking from any purchaser in connection with such sale or transfer that said purchaser will comply with the foregoing notice requirements in connection with any subsequent transfer of such real property.

3. The Company shall provide a copy of this Consent Agreement to all Contractors retained by it to conduct or monitor any portion of the work performed under this Consent Agreement not more than fourteen (14) days after either the Effective Date of this Consent Agreement or the date on which such Contractor is retained, whichever is later. The Company shall use best efforts to cause such persons or entities to comply with the terms of this Consent Agreement.

4. The Company agrees to undertake all actions required by

the terms and conditions of this Consent Agreement, including any portions of this Consent Agreement that are incorporated by reference and made enforceable hereunder as specified in Section XXVIII.

5. The undersigned representative of each Party to this Consent Agreement certifies that he or she is fully authorized by the Party whom he or she represents to enter into the terms and conditions of this Consent Agreement and to execute and legally bind that Party to it.

~~6. Within thirty (30) days after the Effective Date, the Company shall cause to be recorded at the Clark County Recorder's Office notices of obligation, as necessary, to provide access under Section X and related covenants.~~

IV. WORK TO BE PERFORMED

The Company agrees to perform the work specified in this Consent Agreement in the manner and by the dates specified herein. ~~(including the attached Letter of Understanding).~~ All work undertaken pursuant to this Consent Agreement by the Company and/or its Contractor(s) shall be performed pursuant to the Division-approved ~~w~~Workplans required hereunder, and in a manner consistent with all applicable federal and Nevada statutes and their implementing regulations, including all applicable Environmental Laws. The Parties shall also consider applicable or relevant EPA or Division guidance documents identified by the

Division, including the October 1995 guidance for an Environmental Conditions Investigation and the February 1996 guidance for a Remedial Alternatives Study, and provided to the Company by the Division.

A. ~~ENVIRONMENTAL~~ PERCHLORATE CONDITIONS INVESTIGATION.

1. Within sixty (60) days after the effective date of this Consent Agreement, the Company shall submit to the Division for its review and approval ~~an Environmental~~ Perchlorate Conditions Investigation Workplan. The ~~Environmental~~ Perchlorate Conditions Investigation Workplan is subject to approval by the Division in accordance with Section VII (Deliverables Requiring Division Approval).

2. The ~~Environmental~~ Perchlorate Conditions Investigation Workplan shall detail the activities, procedures and methodologies the Company shall undertake and use to perform the ~~Study Item~~ characterization, evaluation or information-gathering needed under this agreement. ~~requirements set forth in the Letter of Understanding attached hereto as Attachment A.~~ A specific schedule for the implementation of all ~~Environmental~~ Perchlorate Conditions Investigation activities shall be included in the ~~Environmental~~ Perchlorate Conditions Investigation Workplan. Such schedule shall provide for the appropriate phasing of ~~Environmental~~ Perchlorate Conditions Investigation activities and the submission of deliverables to the Division

~~(including the submission of discrete portions of the Environmental Conditions Investigation Report as investigatory work concerning specific Study Items is completed)~~ so as to achieve the efficient and timely completion of the ~~Environmental~~Perchlorate Conditions Investigation in a manner consistent with appropriate Division oversight. ~~and with appropriate consideration of the complexity and scope of, and interrelationships among, specific Study Items.~~ The ~~Environmental~~ Perchlorate Conditions Investigation shall result in data of adequate technical quality to support the development and evaluation of remedial alternatives during a subsequent study (including, without limitation, any Remedial Alternatives Study).

3. Concurrent with the submission of the ~~Environmental~~ Perchlorate Conditions Investigation Workplan, the Company shall submit solely for the Division's information purposes a Health and Safety Plan. The Company may submit a single Health and Safety Plan that addresses all investigations and activities required pursuant to this Consent Agreement. Notwithstanding any other provision of this Consent Agreement, no Division approval, disapproval, decision or determination (or the absence thereof) rendered pursuant to this Consent Agreement on the matters addressed herein shall constitute, or be deemed by any entity or person to constitute, an express or implied approval, endorsement, opinion or determination of or by the Division with respect to any health or safety practice, standard or procedure

proposed, implemented or complied with by any person or entity whatsoever in conjunction with any activities conducted pursuant or in any way relating to this Consent Agreement.

B. REMEDIAL ALTERNATIVES STUDY.

1. Following Division approval of ~~any portion of, or the entirety of,~~ the ~~Environmental~~ Perchlorate Conditions Investigation Report, ~~pertaining to one or more Study Items,~~ the Company shall, submit to the Division for its review and approval a Remedial Alternatives Study Workplan within 60 days following receipt of a written notice from the Division specifying the reasons it believes a Remedial Alternatives Study is necessary. ~~, submit to the Division for its review and approval a Remedial Alternatives Study Workplan addressing each Study Item identified in the Division's notice. Each~~ The Remedial Alternatives Study ~~w~~Workplan so submitted is subject to approval by the Division in accordance with Section VI (Deliverables Requiring Division Approval).

2. A specific schedule for the implementation of all Remedial Alternatives Study activities shall be included in the ~~each~~ Remedial Alternatives Study ~~w~~Workplan. Such schedule shall provide for the appropriate phasing of Remedial Alternatives Study activities and Deliverable submissions so as to achieve the efficient and timely completion of the Remedial Alternatives Study in a manner consistent with appropriate Division oversight, ~~and with appropriate consideration of the complexity and scope~~

~~of, and interrelationships among, specific Study Items.~~

3. Any determination made by the Division pursuant to this Section IV.B and any work undertaken pursuant to an approved Remedial Alternatives Study Workplan shall be subject to the other provisions of this Consent Agreement, including without limitation, the provisions of Section XV (Dispute Resolution). However, judgments, conclusions or recommendations included in any Deliverable submitted by the Company pursuant to a Division-approved Remedial Alternatives Study Workplan shall not be subject to Division approval pursuant to Section VI herein.

~~C. INTERIM REMEDIAL MEASURES.~~

~~1. If, at any time during the effective period of this Consent Agreement, the Division determines, based upon consideration of any of the factors specified in paragraph 2 below, that any Release or threatened Release at or associated with the Site may pose an imminent and substantial hazard to human health, welfare, or the Environment, the Division may notify the Company in writing of the measure(s) the Division has determined need to be developed and implemented by the Company to mitigate the imminent and substantial hazard ("Interim Measure(s)"). If deemed appropriate by the Division, the identification of such Interim Measure(s) may be deferred pending the collection by the Company of additional data or information requested by the Division. Upon receiving such written notice, the Division and the Company shall negotiate in good faith~~

whether and to what extent such Interim Measures are required.

2. The following factors may be considered by the Division, *inter alia*, in determining whether any Interim Measure(s) should be required.

a. the time required to develop and implement a final remedial measure;

b. actual or potential exposure of nearby Receptors to Environmental Contaminants;

c. actual or potential contamination of drinking water supplies or sensitive ecosystems;

d. further degradation of the Environmental medium which may occur if an Interim Measure is not implemented expeditiously;

e. the presence of Environmental Contaminants in drums, barrels, tanks, or other bulk storage or disposal containers or facilities that may pose a threat of Release;

f. weather conditions that may cause Environmental Contaminants to be Released;

g. risks of fire or explosion, or potential for exposure to Environmental Contaminants as a result of an accident or failure of a container, facility, or handling system, or

h. any other factor that may indicate the existence of a threat to human health, welfare, or the Environment.

3. If, at any time during the effective period of this Consent Agreement, the Company determines that information or data has been identified or developed indicating that any Release or threatened Release at or associated with the Site poses a potential threat to human health, welfare, or the Environment of a degree as reasonably requires the prompt development and

~~implementation of an Interim Measure(s), the Company shall so notify the Division (1) orally within twenty-four (24) hours, and (2) in writing within three (3) days following the making of such determination, summarizing the immediacy and magnitude of the potential threat.~~

~~4. Within sixty (60) days following any agreement by the Division and the Company regarding the proposed Interim Measures that are the subject of a Division notification pursuant to paragraph 1, the Company shall submit to the Division a workplan for the development and implementation of Interim Measure(s) ("Interim Measure(s) Workplan") as identified in such notification. Each Interim Measure(s) Workplan is subject to approval by the Division. Each Interim Measure(s) Workplan shall address, as appropriate and without limitation.~~

~~a. objectives of the Interim Measure(s),~~

~~b. technical approach,~~

~~c. engineering design and planning (including Division approval of all design plans and specifications),~~

~~d. schedule for development and implementation of the Interim Measure(s),~~

~~e. qualifications of personnel performing the development or implementation of the Interim Measure(s), including Contractor personnel,~~

~~f. health and safety planning,~~

~~g. data collection quality assurance, strategy, management, and analysis,~~

~~h. construction quality assurance, including inspection activities, sampling requirements, documentation and certification of construction consistent with Division approved designs,~~

~~i. operation and maintenance of the Interim Measure(s),~~

~~j. document/data submittals for Division approval, and~~

k. regular progress reporting during the development and implementation of the Interim Measure(s).

5. Interim Measure(s) shall, to the extent practicable, be consistent with the objectives of, and contribute to the performance of, any long term solution at the Site.

6. In the event that the Company and the Division reach agreement with respect to an Interim Measure(s) Workplan, any work undertaken by the Company pursuant thereto shall be governed by the other provisions of this Consent Agreement, including without limitation, the provisions of Section XV (Dispute Resolution). In the event that the Company and the Division are unable to reach agreement with respect to the need for or contents of an Interim Measure(s) Study Workplan, the Division and the Company shall be entitled to exercise their rights pursuant to Section XIX (Reservation of Rights).

D. ADDITIONAL, ALTERNATIVE OR ACCELERATED WORK.

1. The Company may propose that certain response actions, including, without limitation, investigatory or characterization work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to, in lieu of, or on an accelerated schedule relative to the tasks, schedules and Deliverables required pursuant to this Consent Agreement in order to address appropriately the investigation, characterization, evaluation, abatement, minimization, stabilization, mitigation,

~~or elimination of Environmental Contaminants at or associated with the Site or any particular Study Item. If the Division agrees with the Company's additional, alternative or accelerated work proposal, the Division will notify the Company in writing. Thereafter, the Company shall perform the additional work according to a workplan prepared by the Company and approved by the Division (or a modification to an existing Division approved workplan). All additional work performed by any Company under this paragraph shall be performed in a manner consistent with this Consent Agreement. Nothing in this Section shall affect the Parties' reserved rights under Section XIX of this Consent Agreement.~~

~~2. If the Division determines that additional work, including, without limitation, investigatory or characterization work, engineering evaluation, or procedure/methodology modifications, is necessary in order to address appropriately the investigation, characterization, evaluation, abatement, minimization, stabilization, mitigation, or elimination of Environmental Contaminants at or associated with the Site or any particular Study Item the Division shall notify the Company in writing of such work required to be performed by the Company, and shall provide an accompanying statement of the reasons and determinations therefor. The Company shall negotiate in good faith with the Division regarding whether and to what extent such additional work shall be undertaken.~~

~~3. In the event that the Company and the Division reach agreement with respect to any additional, alternative or accelerated workplan, the work undertaken by the Company pursuant thereto shall be governed by the other relevant provisions of this Consent Agreement, including without limitation, the provisions of Section XV (Dispute Resolution). In the event that the Company and the Division are unable to reach agreement with respect to the need for or contents of any additional, alternative or accelerated workplan, the Division and the Company shall be entitled to exercise their rights pursuant to Section XIX (Reservation of Rights).~~

C~~E~~. NO FURTHER ACTION.

1. If at any time the Company believes that sampling results, the performance of other work or other circumstances demonstrate that, with respect to any affected area at or associated with the Site, ~~portion of the Site,~~ no further response actions are required or necessary to protect public health and the environment, the Company may propose that such area ~~portion of the Site~~ no longer be subject to the requirements of this Consent Agreement. If the Division agrees, the Division shall issue a written notice that the affected area is no longer subject to the requirements of this Consent Agreement and may be improved, sold, or otherwise conveyed without further adherence to the requirements of this Consent Agreement. The Division's disapproval of or failure to act upon (within a reasonable time) a proposal made under this Section shall be subject to dispute resolution under Section XV.

2. In making any determination hereunder, the Division may consider within its statutory discretion any and all relevant factors including, without limitation:

a. existing and potential or planned land uses for such portion of the Site and environmental and human exposure threats associated therewith;

b. whether the issuance of such written notice would preclude or significantly and adversely affect the

investigation or remediation of perchlorate ~~Environmental Contaminants~~ at or associated with the BMI Complex, including the Site;

c. the sampling data or other information and circumstances relied upon by the Company; and

d. applicable or relevant and appropriate environmental cleanup standards (including, without limitation, any Division policies regarding contaminated soil and groundwater remediation).

The issuance by the Division of a written exclusion notice hereunder shall not constitute or be construed as either: (1) a release, covenant not to sue, or any other limitation whatsoever on the authority of the Division to respond to existing or subsequently-identified ~~environmental~~perchlorate conditions at or associated with the Site; or (2) a determination, decision or opinion regarding the suitability of any particular land use for the Site.

~~F. NEVADA HAZARDOUS WASTE DISPOSAL LAW COMPLIANCE~~

~~1. For purposes of this Section IV.F, the terms "hazardous constituent," "hazardous waste," "landfill," "land treatment unit," "pile" and "surface impoundment" shall have the meanings specified in 40 C.F.R. § 260.10, each as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632. The term "Subject Unit" means each landfill,~~

~~land treatment unit, surface impoundment, or waste pile unit located at the Site which received hazardous waste after July 26, 1982, or with respect to which closure was certified pursuant to 40 C.F.R. § 265.115, as adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632, after January 26, 1983.~~

~~2. With respect to each Study Item which also is a Subject Unit that was closed by removal or decontamination, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1, such tasks as are necessary to demonstrate that the closure met the standards for closure by removal or decontamination in 40 C.F.R. §§ 264.228, 264.280(e), or 264.258, as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.~~

~~3. With respect to each Study Item which also is a Subject Unit that was not closed by removal or decontamination in accordance with the standard specified in the preceding Paragraph 2, the Company shall include in the Environmental Conditions Workplan required by Section IV.A.1 such tasks as are necessary to develop the groundwater monitoring and hazardous constituent release characterization information specified in Subpart F of 40 C.F.R. Part 264 and 40 C.F.R. § 270.14(c), as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.~~

V. PUBLIC PARTICIPATION

1. Subject to the provisions of Section XI (Confidential Business Information), all Deliverables received by the Division may be made available to the public in accordance with applicable law. The Division may, at its discretion, conduct a public notice or comment procedure with respect to any ~~Environmental~~ Perchlorate Conditions Investigation Report or Remedial Alternatives Study delivered pursuant to this Consent Agreement. The Division shall notify the Company in writing of its determination to provide for, or legal requirement governing, public notice or comment with respect to such document as well as the corresponding adjustment that shall be made to any affected work or Deliverable submittal or approval schedule. Following any such notice and comment period, the Division may require the Company to revise the Deliverable and/or perform reasonable additional work necessary to address appropriately any issue regarding such document identified by the public during such comment period.

2. The Company shall comply with, and participate as required in the implementation of, the Public Involvement Plan as submitted to and approved by the Division pursuant to Section V.2 (Public Participation) of the BMI Common Areas Phase 2 Consent Agreement.

VI. DELIVERABLES REQUIRING DIVISION APPROVAL

1. After review of any Deliverable which is required to be submitted for approval pursuant to this Consent Agreement, the Division shall: (1) approve, in whole or in part the Deliverable; (2) approve the Deliverable upon specified conditions; (3) modify the Deliverable to cure deficiencies and approve the Deliverable as so modified; (4) disapprove, in whole or in part, the Deliverable, directing that the Company modify the Deliverable; or (5) any combination of the above. The Division will provide a written statement of reasons for any approval with conditions, approval with modifications, or disapproval. Notwithstanding any other provision of this Consent Agreement and with respect solely to the first submission to the Division by the Company of a particular Deliverable, if the Division either approves the Deliverable upon conditions or modifies the Deliverable to cure deficiencies and approves the Deliverable as so modified, then the Company shall be deemed to have submitted such Deliverable timely and adequately and no stipulated penalties shall accrue.

2. In the event of approval, approval upon conditions, or modification and approval by the Division pursuant to the preceding paragraph, the Company shall proceed to take any action required by the Deliverable, as approved or modified and approved by the Division, subject only to its right to invoke the Dispute Resolution procedures set forth in Section XV (Dispute Resolution) with respect to the modifications or conditions made

by the Division.

3. a. Upon receipt of a notice of disapproval pursuant to paragraph 1 of this Section, the Company shall, within thirty (30) days, or such later time as may be specified in such notice, correct the deficiencies in all material respects and resubmit the Deliverable for approval. Any stipulated penalties applicable to the Deliverable, as provided in Section XIV, shall accrue during such thirty (30) day or otherwise specified period, but shall not be payable unless the resubmitted Deliverable is disapproved or modified and approved due to a material defect.

b. Notwithstanding the receipt of a notice of disapproval pursuant to paragraph 1 of this Section, the Company shall proceed, at the written direction of the Division, to take any action required by any nondeficient portion of the Deliverable. Implementation of any nondeficient portion of a Deliverable shall not negate the Division's right to seek penalties for the deficient portion under Section XIV (Stipulated Penalties).

4. In the event that a resubmitted Deliverable, or portion thereof, is disapproved by the Division, the Division may again require the Company to correct the deficiencies in all material respects, in accordance with the preceding paragraphs. The Division also retains the right to amend or develop the Deliverable. In the event that the Division modifies and approves a resubmitted Deliverable to cure deficiencies pursuant

to the preceding paragraph such modification and approval shall not negate the Division's right to seek penalties for the deficiencies of the Deliverable as originally submitted as provided in Section XIV (Stipulated Penalties). The Company shall implement any such Deliverable as amended or developed by the Division, subject only to its right to invoke the procedures set forth in Section XV (Dispute Resolution).

5. If upon resubmission, a Deliverable is disapproved or modified and approved by the Division due to a material defect, the Company shall be deemed to have failed to submit such Deliverable timely and adequately unless the Company invokes the dispute resolution procedures set forth in Section XV (Dispute Resolution) and the Division's disapproval or modification is overturned pursuant to that Section. The provisions of Section XV (Dispute Resolution) and Section XIV (Stipulated Penalties) shall govern the implementation of the required work and the accrual and payment of any stipulated penalties during dispute resolution. If the Division's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on which such Deliverable was required.

6. Notwithstanding any provision of this Consent Agreement to the contrary, the Division may not assess any stipulated penalty hereunder for any period of time associated with Division review of any Deliverable (including resubmitted Deliverables) in excess of thirty (30) days from the date such Deliverable was

submitted to the Division. Nothing in this paragraph shall affect the Division's ability to assess stipulated penalties hereunder for and to the extent any Deliverable (including resubmitted Deliverables) is not timely submitted.

7. All Deliverables or portions thereof and other items required to be submitted to the Division under this Consent Agreement shall, upon approval or modification and approval by the Division, be deemed incorporated into, and enforceable under, this Consent Agreement as specified in Section XXVIII. In the event that the Division approves or modifies and approves a portion of a Deliverable required to be submitted to the Division under this Consent Agreement, the approved or modified and approved portion shall be enforceable under this Consent Agreement as specified in Section XXVIII. Oral advice, suggestions, or comments given by Division representatives will not constitute an official approval, nor shall any oral approval or oral assurance of approval be considered binding.

VII. DIVISION APPROVAL OF CONTRACTORS AND CONSULTANTS

1. Except for work performed by employees of the Company, all work performed pursuant to the Consent Agreement shall be under the direction and supervision of a professional engineer, hydrologist, geologist or environmental scientist, ~~with expertise in the investigation and remediation of Environmental~~

~~Contaminants~~ who shall either be or work under the responsible control of an environmental manager certified under Nevada law. Work performed by employees of the Company must be reviewed by a third party consultant acceptable to the Division. Each of the Company's Contractors shall have the technical expertise sufficient to adequately perform all aspects of the work for which it is responsible. Within thirty (30) days following the Effective Date of this Consent Agreement, and before the required work begins, the Company shall notify the Division's Project Coordinator in writing of the names, titles and qualifications of the engineer, hydrologist, geologist or environmental scientist and of any Contractors and their personnel proposed to be used in carrying out the terms of this Consent Agreement. The Company shall identify whether any Contractor is on the List of Parties Excluded from Federal Procurement or Non-Procurement Programs compiled and maintained by the U.S. General Services Administration or on any analogous list compiled and maintained by the State.

2. The qualifications of Key Project Personnel, including the principal project manager and, if different, any Certified Environmental Manager (CEM) undertaking the work for the Company shall be subject to the Division's review and approval, for verification that such persons meet minimum technical background and experience requirements. The Division reserves the right to disapprove the Company's Key Project Personnel for good cause

shown at any time during the effective period of this Consent Agreement. If the Division disapproves any Key Project Personnel proposed by the Company to perform work pursuant to this Consent Agreement, then the Company shall, within thirty (30) days after receipt from the Division of written notice of such disapproval, notify the Division in writing of the name, title and qualifications of any replacement. The Division's disapproval under this Section shall be subject to review in accordance with Section XV of this Consent Agreement.

3. During the effective period of this Consent Agreement, the Company shall notify the Division in writing of any changes or additions in the Key Project Personnel used to carry out the work required by the Consent Agreement, providing their names, titles and qualifications. The Division shall have the same right to approve changes and additions to such persons as it has hereunder regarding the initial notification.

4. For the purposes of this Section, the term "Key Project Personnel" shall mean those individuals who have primary responsibility for the direction of employees or subcontract personnel for major project tasks, outputs or Deliverables including, but not limited to, data collection, data interpretation and report writing.

VIII. QUALITY ASSURANCE

1. The Company shall follow EPA and Division guidance for

sampling and analysis. Workplans shall contain quality assurance/quality control (QA/QC) and chain of custody procedures for all sampling, monitoring, and analytical activities. Any deviations from the QA/QC and chain of custody procedures in approved ~~w~~Workplans must be approved by the Division; must be documented, including reasons for the deviations; and must be reported in the applicable Deliverable.

2. The name(s), addresses, and telephone numbers of the analytical laboratories the Company proposes to use must be submitted to the Division for review and approval prior to work being performed.

3. The Company shall use best efforts to ensure that high quality data is obtained by their Contractor or contract laboratories. The Company shall require that laboratories used by the Company for analysis perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) or other methods deemed satisfactory by the Division. The Company shall submit any deviations from the protocols proposed in any ~~w~~Workplan to the Division for its approval thirty (30) days prior to the commencement of analyses, except in extraordinary circumstances. The Division may reject any data that does not meet the requirements of the approved ~~w~~Workplan or EPA analytical methods and may require resampling and additional analysis.

4. The Company shall ensure that laboratories it or its

Contractor(s) use for analyses participate in a QA/QC program equivalent to that required by EPA under the Contract Laboratory Program (CLP), unless another program is deemed acceptable to the Division. As part of such a program, and upon request by the Division, such laboratories shall perform analyses of samples provided by the Division to demonstrate laboratory performance and the quality of analytical data. If the audit reveals deficiencies in a laboratory's performance or QA/QC, resampling and additional analysis may be required by the Division.

IX. SAMPLING AND DATA AVAILABILITY

1. All final results of sampling, tests, modeling and other data (but not including raw data that has not been subject to QA/QC procedures) generated by the Company, or on the Company's behalf, pursuant to this Consent Agreement shall be submitted to the Division in any progress report required by this Consent Agreement. The Company shall make all raw data available to the Division for review on request, and shall submit such data to the Division on written request. The Division will provide to the Company validated data generated by the Division unless it is exempt from disclosure by any federal or state law or regulation.

2. The Company shall notify the Division in writing at least five (5) working days prior to conducting sampling described in any ~~w~~Workplan required by this Consent Agreement. If the Company believes it must commence emergency field

activities without delay, the Company may seek emergency telephone authorization from the Division Project Coordinator or, if the Division Project Coordinator is unavailable, his/her Bureau Chief, the Administrator, or the Deputy Administrator, to commence such activities immediately. At the Division's oral or written request, the Company shall provide or allow the Division or its authorized representative to take split or duplicate samples of all samples collected by or on behalf of the Company pursuant to this Consent Agreement.

X. SITE ACCESS

1. At all reasonable times, upon reasonable notice and in conformance with any health and safety requirements at the Site, the Division, its Contractors, employees, and/or any duly designated Division representatives carrying out the authority of the Division shall have the authority to enter and freely move about all property at the Site where work, if any, is being performed pursuant to this Consent Agreement for the purposes of, *inter alia*: (1) discussing the work being performed under this Consent Agreement with relevant Company or Contractor personnel; (2) inspecting conditions, activities, the results of activities, records, operating logs, and contracts related to the Site or the Company and their Contractors pursuant to this Consent Agreement; (3) reviewing the progress of the Company in carrying out the terms of this Consent Agreement; (4) conducting such tests,

sampling, or monitoring as the Division or its authorized representatives deem necessary; (5) with the written consent of the Company, which shall not be unreasonably withheld, using a camera, sound recording device or other documentary type equipment; (6) verifying the reports and data submitted to the Division by the Company; and (7) inspecting and copying all nonprivileged records, files, photographs, documents, sampling and monitoring data, and other writings or materials related to work undertaken in carrying out the requirements of this Consent Agreement. Nothing herein shall be interpreted as limiting, waiving or otherwise affecting (1) the Division's right of entry or inspection under state or federal laws; (2) any attorney-client, work-product or other privilege with respect to any matter affecting the Company; or (3) the Company's right to seek confidential treatment of any matter pursuant to applicable law.

2. To the extent that the Site or any other property to which access is required for the performance of work required under this Consent Agreement is owned or controlled by persons or entities other than the Company, the Company shall use best efforts to obtain access to such property for the Company, as well as for the Division and its authorized representatives, within thirty (30) working days after the date that the need for access becomes known to the Company. For purposes of this paragraph, "best efforts" shall include, at a minimum, a certified letter from the Company to the present owners of such

property requesting access agreements to permit the Company and the Division, including its authorized representatives, to access such property, and the payment of reasonable compensation in consideration of granting access. Any such access agreement shall be incorporated by reference into this Consent Agreement upon execution. The Company shall provide to the Division's Project Coordinator a copy of each such access agreement. In the event that any necessary agreement for access is not obtained within thirty (30) days following approval of any ~~w~~Workplan for which access is required, or following the date that the need for access became known to the Company, the Company shall notify the Division thereafter regarding both the efforts undertaken to obtain access and its failure to obtain such access agreement. The Division shall cooperate with the Company in obtaining access, but the Company shall pay any just compensation required for access as described hereinabove. In the event that the Division obtains access, the Company shall undertake Division approved work on such property.

3. The Company agrees to indemnify, defend and hold harmless the Division as provided in Section XVIII (Indemnification), for any and all claims arising from the Company's, or its officers', employees', agents' or Contractors' activities on such property.

4. Nothing in this Section or any other provision of this Consent Agreement shall be construed to limit or otherwise affect

the Company's liability and obligations with respect to any Release at or associated with the Site.

~~5. Notwithstanding any other paragraph in this Section, upon receipt of a written request from the Division specifying the need for access, the Company shall grant any other entity identified in such request which is performing Phase II work with respect to the BMI Complex, including its Contractors and other authorized representatives, the authority to enter and move about the Site at all reasonable times for the purpose of conducting such testing, sampling, monitoring or other work required to be performed by such entity pursuant to such other agreement as has been entered into between the Division and such entity. The Company shall not require payment of compensation in consideration of granting such access. However, granting access may be conditioned upon receiving from any entity seeking such access, written assurances that. such access will be reasonable in scope and will be at the sole risk and expense of the entity seeking access, the entity seeking access will comply with the Company's safety rules and regulations and will have (and make reasonable efforts to ensure its Contractors have) reasonable levels of liability insurance in place and will agree to hold the Company harmless from loss, damage or injury caused by its entry.~~

XI. CONFIDENTIAL BUSINESS INFORMATION

1. All information required by this Consent Agreement will

be deemed public information upon submittal to the Division unless the Company requests in writing at the time of submittal that specific information be treated as confidential business information in accordance with NRS § 459.555 or 445.311 and the Division grants the request. Pending such determination and any appeals thereof, the Division shall treat such information as confidential. Any assertion of confidentiality shall be adequately substantiated in writing by the Company when the request is made.

2. The Company agrees not to assert any confidentiality claims with respect to any data related to Site conditions, sampling, or monitoring except in those instances where a Company official certifies in writing at the time such data is submitted to the Division that specific data related to Site conditions is entitled to protection as a "trade secret" pursuant to the standards set forth in NRS § 459.3846(3)(a)-(d). The Division shall treat such data as confidential if the Company has established to the satisfaction of the Division at the time of the certification submittal that the data is entitled to protection as a "trade secret" and pending such determination and any timely appeals thereof.

XII. RECORD PRESERVATION

1. The Company shall retain, during the effective period of this Consent Agreement and for a minimum of ten (10) years

following termination of this Consent Agreement, all data, records, documents, and Deliverables (but excluding drafts, duplicates and privileged materials) which it now has in its possession or control or which come into its possession or control, which relate in any way to this Consent Agreement and to the management and/or disposal of perchlorate ~~Environmental Contaminants~~ at the Site as they relate to this Consent Agreement. Information within the possession or control of the Company shall include all data, documents and records in the possession of its divisions, officers, directors, employees, agents, successors and assigns. After the expiration of such ten-year period, the Company shall notify the Division, or its successor, at least ninety (90) days prior to the scheduled destruction of such data, records, documents or Deliverables and shall provide the Division or its successor with the opportunity to take possession of such materials. Such written notification shall reference the effective date and caption of this Consent Agreement and shall be addressed to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710
ATTENTION: Chief, Bureau of Corrective Actions

2. The Company further agrees that within thirty (30)

days after retaining or employing any Contractor for the purpose of carrying out the terms of this Consent Agreement, the Company shall enter into an agreement with such Contractor which requires such Contractor to provide the Company with a copy of all Deliverables prepared or produced pursuant to this Consent Agreement.

3. All documents and data required to be maintained by paragraph 1, other than those documents required for the operations of any Company, shall be stored by the Company in a centralized location in the State of Nevada and the Company shall provide access to such nonprivileged documents and data to the Division and its authorized representatives.

XIII. REPORTING AND DOCUMENT CERTIFICATION

1. Beginning with the first full month following the Effective Date, and throughout the effective period of this Consent Agreement, the Company shall provide the Division with quarterly progress reports. Each progress report shall be filed with the Division no later than fifteen (15) days after the conclusion of the quarter for which the report provides information. Progress reports shall conform to requirements in the approved ~~w~~Workplan.

2. An original and three (3) copies of all Deliverables concerning the activities performed pursuant to the terms and conditions of this Consent Agreement, shall be hand delivered;

sent by certified mail, return receipt requested; sent by overnight parcel delivery service; or sent by verified facsimile transmission to the Project Coordinator at the following address:

a. Deliverables or other materials to be submitted to the Division should be sent to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710
ATTENTION: Chief, Bureau of Corrective Actions

3. Deliverables or other materials to be submitted to the Company should be sent to:

Susan Crowley
Kerr-McGee Chemical Corporation
8000 West Lake Mead Drive
P.O. Box 55
Henderson, Nevada 89009-7000

Other addresses also may be designated or approved by the Division Project Coordinator.

4. Any final report prepared pursuant to an approved ~~w~~Workplan (other than progress reports) submitted by the Company pursuant to this Consent Agreement shall be certified by a responsible corporate officer of the Company. A responsible corporate officer means: a president, secretary, treasurer,

general manager, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the Company.

5. The certification required by paragraph 4 above, shall be executed before and notarized by a notary public and shall be in the following form:

> "I certify that this document and all attachments were prepared in accordance with a system designed to evaluate the information submitted. I certify that to the best of my knowledge and belief, formed after due and appropriate inquiry and investigation, the information contained in or accompanying this submittal and provided by the Company that I represent is true, accurate, and complete in all material respects. I certify that this submittal and all attachments were prepared in accordance with procedures 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 directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted and provided by the Company that I represent is, to the best of my knowledge and belief, true, accurate, and complete in all material respects. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____
Name: _____
Title: _____
Company: _____
Date: _____

XIV. STIPULATED PENALTIES

1. Unless there has been a written modification by the Division of a compliance date, a written modification by the Division of an approved ~~w~~Workplan condition, or excusable delay

as defined in Section XVI (Force Majeure) of this Consent Agreement, if the Company fails to comply with any term or condition set forth in this Consent Agreement in the time or manner specified herein, the Division may assess stipulated penalties against the Company as set forth hereinbelow. All penalty amounts set forth herein are maximum amounts. Nothing in this Consent Agreement shall be construed to limit in any manner (except as set forth herein) the Division's prosecutorial discretion with respect to whether to take enforcement action or to assess less than the maximum penalty associated with any alleged violation of the requirements of this Consent Agreement. Any stipulated penalties assessed pursuant to this Consent Agreement shall be the sole penalties assessable by the Division hereunder against the Company for noncompliance with this Consent Agreement.

a. For failure to submit any Deliverable requiring Division approval on a timely basis as required by this Consent Agreement or any approved ~~w~~Workplan:

Continuous Period of Noncompliance	Maximum Penalty Per Day
1st - 7th day	$500
8th - 21st day	$2500
22nd day and thereafter	$5000

b. For failure to comply with any other provision of this Consent Agreement, including without limitation, failure to (i) commence, perform, and/or complete field work

in a manner acceptable to the Division or at the time required pursuant to this Consent Agreement or any approved ~~w~~Workplan; (ii) complete and submit to the Division any required ~~w~~Workplans, reports or other written submittals (other than progress reports) requiring Division approval in a manner acceptable to the Division as required by this Consent Agreement or any approved ~~w~~Workplan; or (iii) comply with Section IV.C.3.

Continuous Period of Noncompliance	Maximum Penalty Per Day
1st - 7th day	$500
8th - 21st day	$2500
22nd day and thereafter	$5000

Solely with respect to violations described in this subparagraph 1.b for which the Company has invoked rights to dispute resolution pursuant to Section XV, the maximum penalty assessable for any particular continuous period of noncompliance under this subparagraph 1.b shall be $253,500.

2. Except as otherwise provided herein, all stipulated penalties shall begin to accrue on the day after complete performance is due or the day a violation occurs, and shall continue to accrue through the day that performance is completed or the violation is corrected. A "continuous period of noncompliance," for purposes of subparagraphs 1.a and 1.b, means

any continuous period during which one or more of the violations described respectively therein remain uncorrected. The Division may assess separate stipulated penalties for separate violations of this Consent Agreement. The stipulated penalties set forth in the preceding paragraph shall be in addition to any other non-monetary remedies or sanctions which may be available to the Division by reason of the Company's failure to comply with the requirements of this Consent Agreement.

3. Following any Division determination that the Company has failed to comply with the requirements of this Consent Agreement, the Division may give the Company written notification of the same and describe the noncompliance. Said notice shall also indicate the amount of penalties due.

4. All penalties owed to the Division under this Section shall be payable to the State within thirty (30) days after the Company's receipt from the Division of the notification of noncompliance, unless the Company invokes the dispute resolution procedures under Section XV (Dispute Resolution). Penalties shall continue to accrue during any dispute resolution period, except that the accrual of such penalties shall be suspended during any period of time in excess of the 30-day period set forth in Section XV.5 for the Division to render its decision on any dispute. Penalties assessed under this Section need not be paid until thirty (30) days following the resolution of the dispute pursuant to Section XV if the Division prevails.

Interest shall begin to accrue on any unpaid balance at the end of the thirty (30) day period following notification of noncompliance. The Company shall pay interest to the Division as follows: interest shall accrue at the Current Value of Funds Rate established by the Secretary of the United States Treasury. An additional penalty of 6 per cent per annum on any unpaid principal shall be paid to the Division for any stipulated penalty payment which is overdue for ninety (90) or more days.

5. All penalties, including interest, shall be made payable by certified or cashier's check to the State of Nevada and shall be remitted to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710
ATTENTION: Chief, Bureau of Corrective Actions

All such checks shall reference the name of the Site and the Company's name and address. Copies of all such checks and letters forwarding the checks shall be sent simultaneously to the Division Project Coordinator.

6. Neither the initiation of dispute resolution proceedings nor the payment of stipulated penalties shall alter in any way the Company's obligation to comply with the terms and conditions of this Consent Agreement and the attachments hereto. Without modifying Paragraph 4 of Section XIV, the Parties do not

intend the preceding sentence to require the Company, during the pendency of any good faith dispute, to take actions that would have the effect of mooting the subject of the dispute.

7. If the Company fails to pay stipulated penalties, the Division may institute proceedings to collect the penalties.

8. Except with respect to violations for which penalties are assessable under subsection 1.a of this Section XIV, no penalties shall accrue until the Company receives a written notice from the Division identifying the violation, the basis for the violation, and a reasonable time within which the Company is required to correct the violation.

XV. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve all disputes 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 the Company fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the disputed issue.

2. If the Company disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, the Company's Project Coordinator shall notify the Division Project Coordinator in writing of the dispute ("Notice

of Dispute").

3. Any dispute which 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 thirty (30) 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 thirty (30) days after the conclusion of the informal negotiation period, the Company 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 the Company claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for the Company's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by the Company, 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 thirty (30) days following receipt of a Statement of Position, or by such later date within thirty (30) days after any oral presentation by the Company as the Administrator may deem appropriate to adequately address such oral presentation, the Administrator shall issue his/her decision which shall be binding on the Company and unappealable unless, within twenty (20) days after receipt of the decision, the Company exercises its rights as stated in paragraph 6 of this Section. The Administrator's written decision shall include a response to the Company'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, the Company may 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.

7. Except as provided in Section XIV (Stipulated Penalties), the existence of a dispute as defined in this Section

and the Administrator's consideration of matters placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline required of the Company under this Consent Agreement during the pendency of the dispute resolution process. Without modifying Paragraph 4 of Section XIV, the Parties do not intend the preceding sentence to require the Company, during the pendency of any good faith dispute, to take actions that would have the effect of mooting the subject of the dispute.

XVI. FORCE MAJEURE

1. The Company 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*. The Company 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 the Company, or of any person or entity controlled by the Company, which delays or prevents the timely performance of any obligation under this Consent Agreement despite the Company's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes, lockouts, national emergencies, delays in obtaining access to property not owned or controlled by the Company despite timely

best efforts to obtain such access, and delays occasioned by PEPCON's failure timely to complete work under PEPCON'S Consent Agreement within a timeframe that would allow the Company's work to proceed in a manner contemplated by the schedule of the Consent Agreement, and delays in obtaining any required approval or permit from the Division or any other public agency that occur despite the Company'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 the Company's obligations under this Consent Agreement, whether or not caused by a *force majeure* event, the Company's Project Coordinator or, in his or her absence, a responsible corporate official, shall notify orally the Division's Project Coordinator or, in his or her absence, the Administrator or Deputy Administrator, as the case may be, within two (2) business days of when the Company first knew or should have known that the event might cause a delay. If the Company wishes to claim a *force majeure* event, then within ten (10) days

thereafter, the Company 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; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Company's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of the Company, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the Environment. The Company 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 the Companies from asserting any claim of *force majeure* for that event.

3. The Division shall notify the Company in writing of its *force majeure* determination within fifteen (15) days after receipt of the notice from the Company. 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 the Company 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 the Company cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, or 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 XV of this Consent Agreement.

XVII. REIMBURSEMENT OF DIVISION OVERSIGHT COSTS

1. Following the Effective Date and for the effective period of this Consent Agreement, the Company(ies) shall reimburse the Division for costs reasonably incurred for oversight of this Consent Agreement in the manner prescribed by Section XVII (Reimbursement of Division Oversight Costs) of such BMI Common Areas Phase 2 Consent Agreement.

2. In the event that the parties obligated thereunder fail to comply with Section XVII (Reimbursement of Division Oversight Costs) of the BMI Common Areas Phase 2 Consent Agreement, then the Company shall be obligated to reimburse the Division for any

unpaid oversight costs and expenses as described in Paragraph 1, and subject to dispute resolution pursuant to paragraph 2, of said Section XVII that are: (i) not the subject of dispute resolution proceedings under Section XV of the BMI Common Areas Phase 2 Consent Agreement; and (ii) attributed to the Company or the Company's Site in an invoice submitted by the Division as required by Paragraph 2 of Section XVII of the BMI Common Areas Phase 2 Consent Agreement. Amounts due under this paragraph shall be paid by the Company within thirty (30) days after receipt by the Company of written notice from the Division indicating the obligated parties' failure to pay and the amount owing.

3. In the event that the BMI Common Areas Phase 2 Consent Agreement terminates for any reason before this Consent Agreement terminates in accordance with Section XXX (Termination) hereof, the Company shall be obligated hereunder to reimburse the Division for oversight costs and expenses attributed to the Companies or the Site as described in Paragraph 1, and subject to dispute resolution pursuant to paragraph 2, of Section XVII (Reimbursement of Division Oversight Costs) of such BMI Common Areas Phase 2 Consent Agreement that are incurred by the Division in the ongoing administration of this Consent Agreement. In that event, the Division shall submit to the Company a monthly invoice, commencing with the first full calendar month after the termination of the BMI Common Areas Phase 2 Consent Agreement,

containing the information described in Paragraph 2 of Section XVII of such BMI Common Areas Phase 2 Consent Agreement. Amounts due under this section shall be paid within thirty (30) days after receipt of each invoice by a check 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 such checks shall reference the name of the Site and the Company's name and address. Copies of all such checks and letters forwarding the checks shall be sent simultaneously to the Division Project Coordinator. Any failure by the Company to timely make any payment required under this Section shall be subject to the interest rate specified in Section XIV.

XVIII. INDEMNIFICATION

The Company agrees to indemnify, defend, save and hold harmless the Division, its Contractors, agents and employees from any and all claims or causes of action arising from or on account of acts or omissions of the Company or its officers, employees, agents or Contractors in carrying out the activities required by or otherwise pursuant to this Consent Agreement.

XIX. RESERVATION OF RIGHTS

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~~Environmental Contaminant~~ at or otherwise associated with the Site.

2. Notwithstanding any provision of this Consent Agreement to the contrary, the Division covenants not to sue the Company for oversight costs incurred by the Division under this Consent Agreement in excess of the amounts specified in Section XVII. In the event the Division undertakes to perform any work required of the Company under this Consent Agreement, or to issue an order to the Company to complete such work, the Division covenants not to sue the Company for any stipulated penalties accruing or accruable after the date of such undertaking or issuance.

XXII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Consent Agreement shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. The Company shall obtain or cause its representative(s) to obtain all permits and approvals necessary under such laws and regulations.

XXIII. PROJECT COORDINATORS

1. Within thirty (30) days following the Effective Date, the Division and the Company each shall designate a Project Coordinator and shall notify each other in writing of the Project Coordinator selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Consent Agreement and for designating a person to act in his/her absence. The Division Project Coordinator will be the Division's designated representative for the Site. To the maximum extent practicable, all communications between the Company and the Division, and all Deliverables, documents, reports, approvals, and other correspondence concerning the activities performed pursuant to this Consent Agreement, shall be in writing and shall be directed to the appropriate Project Coordinator.

2. The Parties shall provide at least seven (7) days written notice prior to changing Project Coordinators.

3. The absence of the Division Project Coordinator from the Site shall not be cause for the stoppage of work.

XXIV. COMPUTATION OF TIME

For purposes of computing due dates set forth in this Consent Agreement, the Effective Date, or the day of the act, event, or default from which the designated period of time begins to run, shall be designated and counted as Day zero (0). Calendar days shall be utilized in computing due dates. The last

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

December 17, 1997

Mr. Robert Kelso
Supervisor Remediation Branch
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0866

Dear Mr. Kelso:

Subject: Exclusion Request for Southern KMCC Property

Kerr-McGee Chemical Corporation (KMCC) requests a no further action determination and a written assurance regarding future liability for the southern portion of KMCC's property (the Property) within the BMI Industrial Complex, Clark County, Nevada, also within the limits of the City of Henderson. The Property is more fully described in the legal description, which is attached as Exhibit A and incorporated by this reference. KMCC also requests release of the Property from the terms, requirements and obligations of the Consent Agreement entered into by the NDEP respecting the KMCC Henderson facility, dated August 12, 1996.

KMCC's request is based on an assessment of the Property, the Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, NV (Kleinfelder, Inc., April 15, 1993). KMCC believes this report adequately characterizes the environmental conditions at the KMCC facility including the parcel which this exclusion request covers and fulfills the environmental assessment requirements of the NDEP's letter to Basic Management, Inc. dated March 8, 1994. The letter states, "if the environmental assessment for a particular parcel indicates no public health or environmental problems are present, the Division will issue a letter indicating development may proceed on the property." KMCC desires to allow development of the property and requests a letter stating that no further actions are necessary with respect to the Property, certifying that development may proceed without environmental restriction, and assuring third parties that the NDEP will not seek to hold them liable for any environmental conditions on the Property.

If you have any questions please call me at (702) 651-2234. Thank you for your consideration and assistance.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By certified mail
cc: PSCorbett
RHJones
TWReed
PBDizikes
RANapier
Gregory W. Schlink, BMI

SMC\Southern exclusion request.doc

EXHIBIT A
BOUNDARY DESCRIPTION

A PARCEL OF LAND SITUATE THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 13; THENCE ALONG THE EAST LINE THEREOF, SOUTH 00°19'30" WEST, A DISTANCE OF 1956.16 FEET TO THE POINT OF INTERSECTION WITH THE NORTHERLY RIGHT-OF-WAY LINE OF LAKE MEAD DRIVE (NEVADA STATE HIGHWAY NO. 146): THENCE ALONG SAID RIGHT-OF-WAY LINE, SOUTH 81°09'41" WEST, A DISTANCE OF 1028.66 FEET; THENCE DEPARTING SAID RIGHT-OF-WAY LINE AND CONTINUING ON THE SAME COURSE, SOUTH 81°09'41" WEST, A DISTANCE OF 454.00 FEET TO A POINT ON AFORESAID RIGHT-OF-WAY LINE FOR **THE POINT OF BEGINNING**; THENCE ALONG SAID RIGHT-OF-WAY LINE, SOUTH 81°09'41" WEST, A DISTANCE OF 1292.59 FEET TO A POINT OF INTERSECTION WITH THE EASTERLY SIDE LINE OF SIXTH STREET; THENCE DEPARTING SAID RIGHT-OF-WAY LINE AND ALONG SAID SIDE LINE, NORTH 08°51'37" WEST, A DISTANCE OF 430.10 FEET; THENCE NORTH 81°22'26" EAST, A DISTANCE OF 1292.60 FEET TO A POINT OF INTERSECTION WITH THE WESTERLY BOUNDARY OF THAT CERTAIN PROPERTY OWNED BY THE UNITED STATES OF AMERICA AND SHOWN UPON THE CLARK COUNTY ASSESSOR'S MAP AS APN 178-013-601-003; THENCE ALONG SAID BOUNDARY, SOUTH 08°51'37" EAST, A DISTANCE OF 425.31 FEET TO TO THE POINT OF BEGINNING.

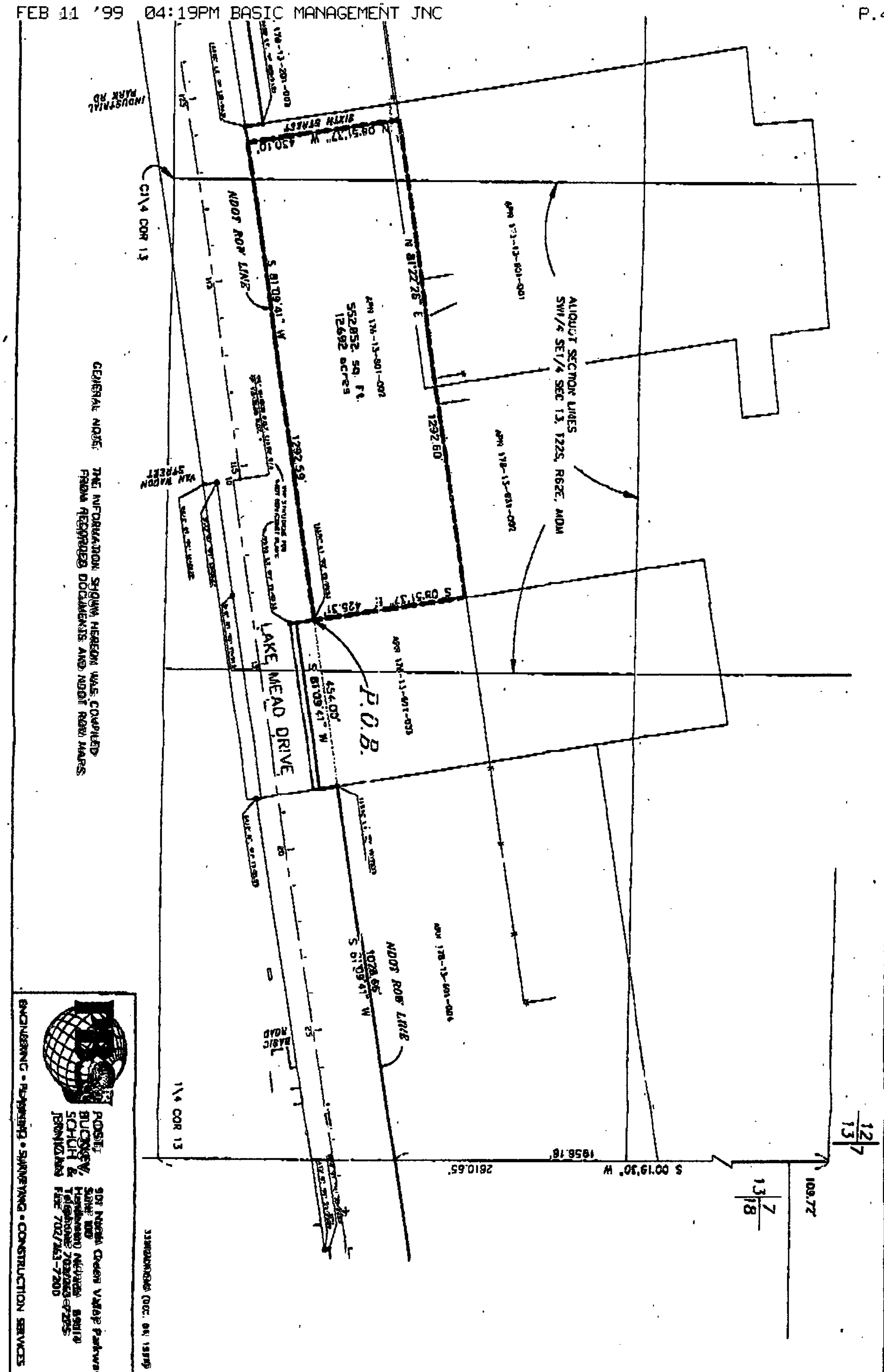
SAID PARCEL CONTAINS APPROXIMATELY 552,852 SQ. FT. (12.692 ACRES).

BASIS OF BEARING
SOUTH 00°19'30" WEST BEING THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13, TOWNSHIP 22 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA, AS DESCRIBED IN THAT CERTAIN DOCUMENT RECORDED IN BOOK 844, INSTRUMENT NO. 678196 OF OFFICIAL RECORDS.

NOTE: THE ABOVE BOUNDARY DESCRIPTION WAS WRITTEN FROM RECORDED INFORMATION AND NO FIELD SURVEY WAS DONE TO VERIFY IT'S LOCATION UPON THE GROUND. ALSO, THE ABOVE BOUNDARY DESCRIPTION DOES NOT REPRESENT A LEGAL PARCEL OF LAND PER NEVADA REVISED STATUTES, CHAPTER 278, UNTIL SUCH A TIME A SUBDIVISION MAP IS RECORDED.

PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
BERNARD F. KOCHEVAR, SR.
12/4/97
No. 8381

C:\LEGAL\51330\33012ACR.LGL
December 04, 1997, bfk sr.



SIXTH STREET
N 08°51'37" W 430.10'
N 81°22'26" E
1292.60'
S 81°09'41" W
1292.59'
552,852 SQ. FT.
12.692 ACRES
NDOT ROW LINE
C 1/4 COR 13
ALIQUOT SECTION LINES
SW1/4 SE1/4 SEC 13, T22S, R62E, MDM
S 08°51'37" E 425.31'
LAKE MEAD DRIVE
P.O.B.
454.00'
S 81°09'41" W
VAN WAGON STREET
GENERAL NOTE: THE INFORMATION SHOWN HEREON WAS COMPILED FROM RECORDED DOCUMENTS AND NDOT ROW MAPS.
1078.66'
S 81°09'41" W
1/4 COR 13
S 00°19'30" W
1858.16'
2610.65'
109.72'
POSEY BUCKLEY SCHUH & JERNIGAN
ENGINEERING • PLANNING • SURVEYING • CONSTRUCTION SERVICES

BLACK MTN IND PARK VICTORY VALLEY LAND 12.69 ACRE SITE	JOB NO.	51330	DRAWN	BFK Sr	DATE	12/04/97
	SHEET NO.	1 OF 1	CHECKED	CDK	SCALE	1"=240'

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

May 14, 1998

Mr. Robert Kelso
Supervisor Remediation Branch
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0866

Dear Mr. Kelso:

Subject: Exclusion Request for Black Mountain Industrial Center - KMC Property

Kerr-McGee Chemical LLC(KMC) requests a no further action determination and a written assurance regarding future liability for a portion of KMC's property (the Property) within Clark County, Nevada, also within the limits of the City of Henderson. The Property is more fully described in the legal description, which is attached as Exhibit A and incorporated by this reference. KMC also requests release of the Property from the terms, requirements, and obligations of the Consent Agreement entered into by the NDEP respecting the Kerr-McGee Chemical Corporation Henderson facility, dated August 12, 1996.

KMC's request is based on an assessment of the Property, the Environmental Conditions Assessment (ECA), Kerr-McGee Chemical Corporation, Henderson, Nevada (Kleinfelder, Inc., April 15, 1993). In addition, NDEP has previously issued a no further action determination (to the City of Henderson) on a parcel immediately adjacent to the Property. The adjacent parcel is included in the Warm Springs right-of-way. KMC believes the ECA report and the characterization of the adjacent parcel, with its subsequent NDEP release, provide an adequate characterization of the environmental conditions relating to the Property which this exclusion request covers and fulfills the environmental assessment requirements of the NDEP's letter to Basic Management, Inc, dated March 8, 1994. The letter states, "if the environmental assessment for a particular parcel indicates no public health or environmental problems are present, the Division will issue a letter indicating development may proceed on the property." KMC desires to allow development of the property and requests a letter stating that no further actions are necessary with respect to the Property, certifying that development may proceed without environmental restriction and assuring third parties that the NDEP will not seek to hold them liable for any environmental conditions on the Property.

If you have any questions please call me at (702) 651-2234. Thank you for your consideration and assistance.

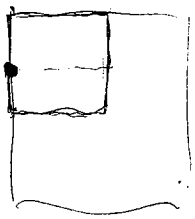
Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Attachment
By certified mail
cc: PSCorbett
PBDizikes
RHJones
RANapier
TWReed
Gregory W. Schlink, BMI
SThornhill

SMC\EXCLUSION REQUEST SNAP KM.DOC

EXHIBIT A



BOUNDARY DESCRIPTION
FOR
BLACK MOUNTAIN INDUSTRIAL CENTER
KER MCGEE - 4.99 ACRES

A PORTION OF APN 178-12-601-001, BEING A PORTION OF SECTION 12, TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA, MORE PARTICULARLY DESCRIBED AS FOLLOWS.

BEGINNING AT THE NORTHWEST CORNER OF THE SOUTH HALF (S ½) OF THE NORTHWEST QUARTER (NW ¼) OF SAID SECTION 12; THENCE SOUTH 89°53'06" EAST, ALONG THE NORTH LINE OF THE SOUTH HALF (S ½) OF THE NORTHWEST QUARTER (NW ¼) OF SAID SECTION 12, A DISTANCE OF 770.16 FEET TO THE NORTHWEST CORNER OF ASSESSOR'S PARCEL 178-12-601-002; THENCE DEPARTING SAID NORTH LINE, ALONG THE EAST LINE OF SAID PARCEL 178-12-601-002, SOUTH 09°19'23" EAST, A DISTANCE OF 547.01 FEET; THENCE NORTH 57°48'55" WEST, A DISTANCE OF 90.97 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 15050.00 FEET; THENCE ALONG SAID CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 3°32'03" AN ARC LENGTH OF 928.30 FEET; THENCE NORTH 00°29'56" EAST, A DISTANCE OF 34.48 FEET TO THE POINT OF BEGINNING.

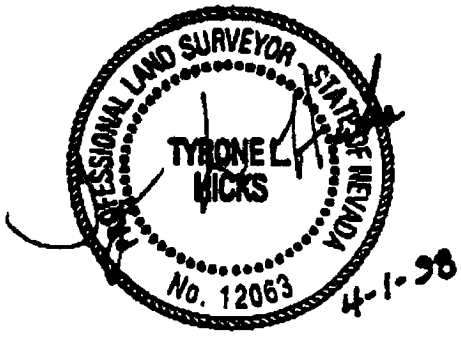
SAID PARCEL CONTAINING APPROXIMATELY 4.99 ACRES.

BASIS OF BEARINGS

THE BASIS OF BEARING FOR THIS LEGAL DESCRIPTION IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NC83) EAST ZONE (2701).

NOTE:

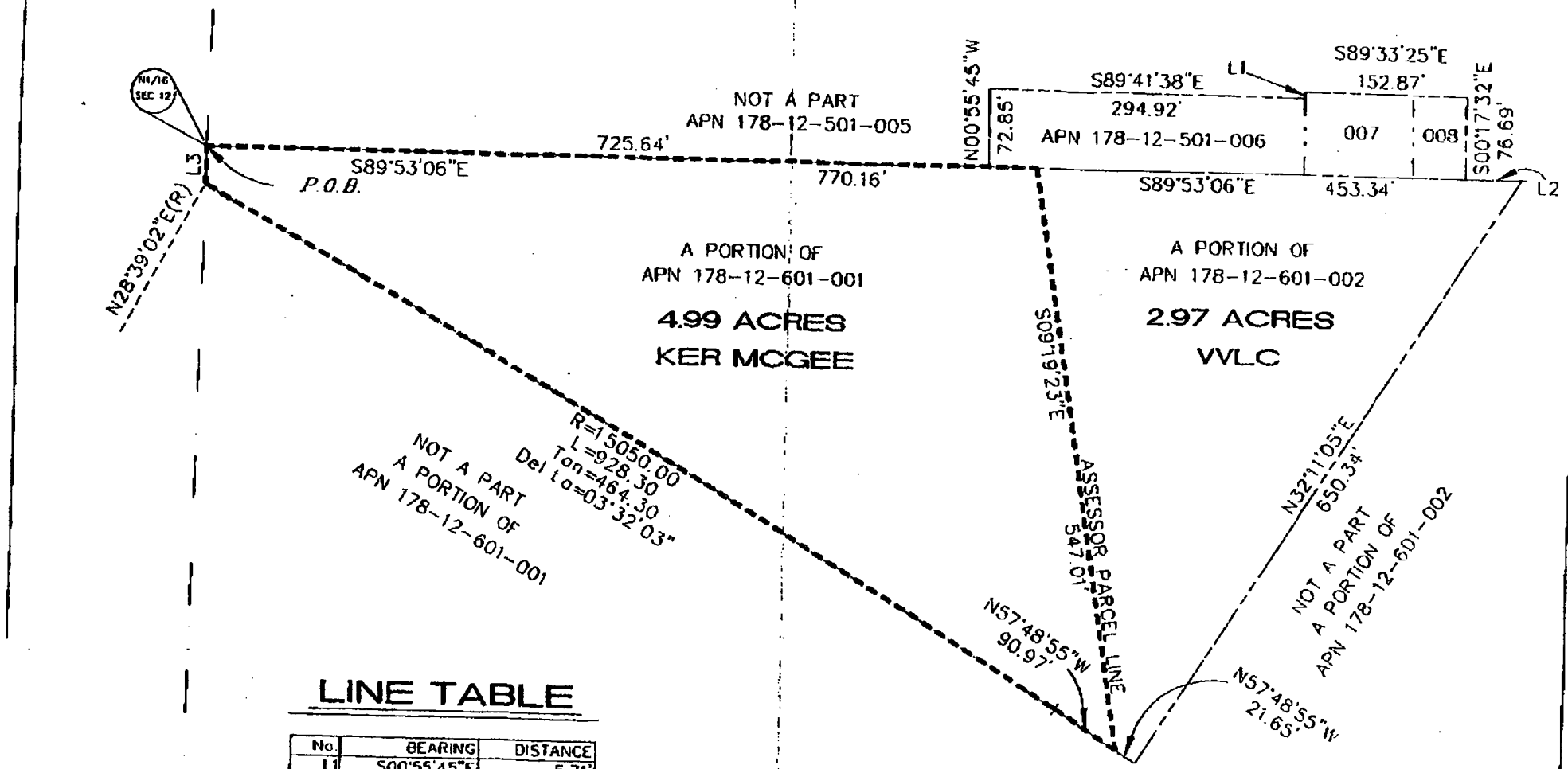
THE ABOVE BOUNDARY DESCRIPTION DOES NOT REPRESENT A LEGAL PARCEL OF LAND PER NEVADA REVISED STATUTES, CHAPTER 278, UNTIL SUCH A TIME A SUBDIVISION MAP IS RECORDED.



C:\LEGALS\1350\350KM.LGL
March 31, 1998 - bfk sr

EXHIBIT TO ACOMPANY LEGAL DESCRIPTION

A PORTION OF SECTION 12,
TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA



LINE TABLE

No.	BEARING	DISTANCE
L1	S00°55'45"E	5.71'
L2	S89°53'06"E	50.95'
L3	N00°29'56"E	34.48'

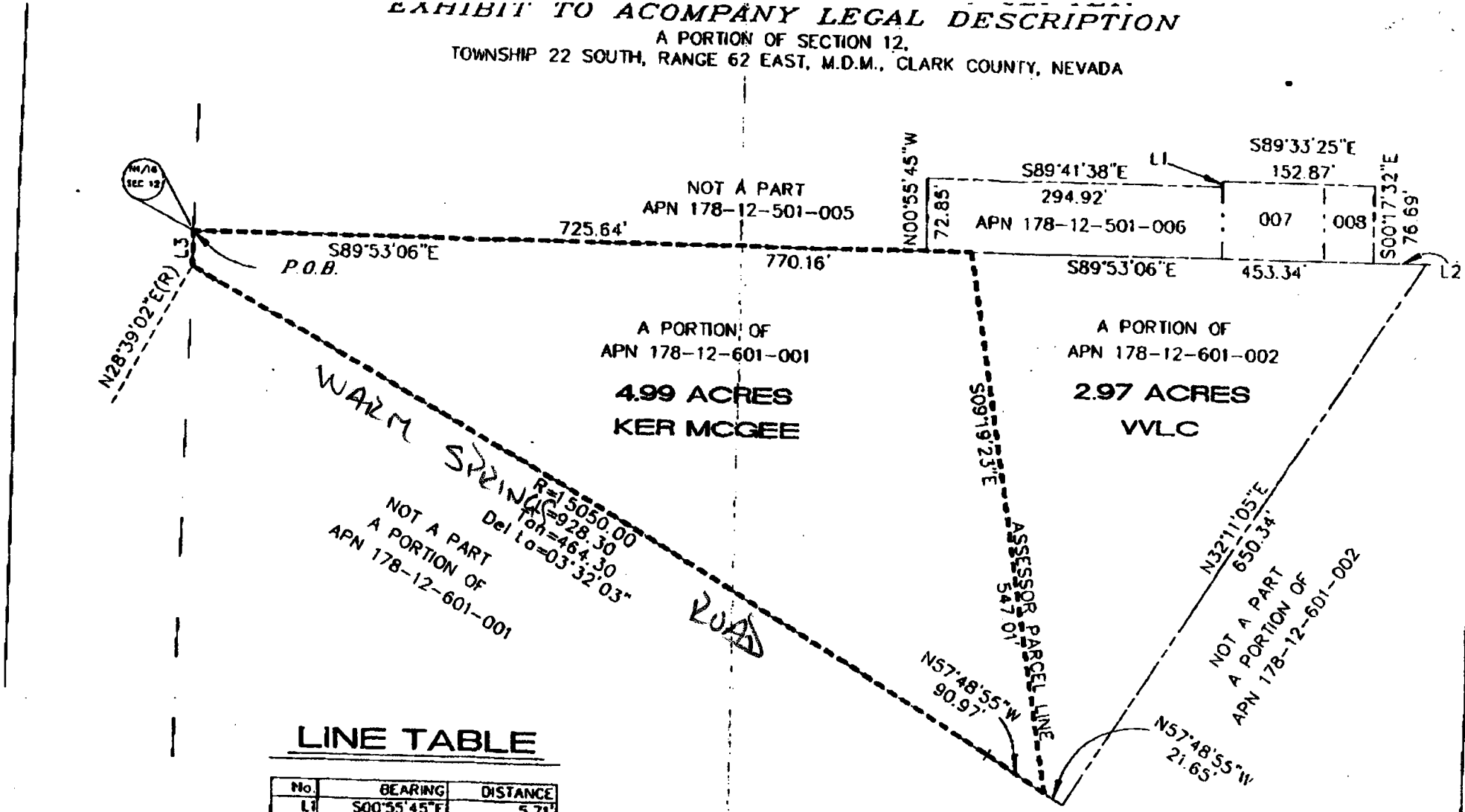
N

NOT TO SCALE:

SHEET 1 of 1

EXHIBIT TO ACOMPANY LEGAL DESCRIPTION

A PORTION OF SECTION 12,
TOWNSHIP 22 SOUTH, RANGE 62 EAST, M.D.M., CLARK COUNTY, NEVADA



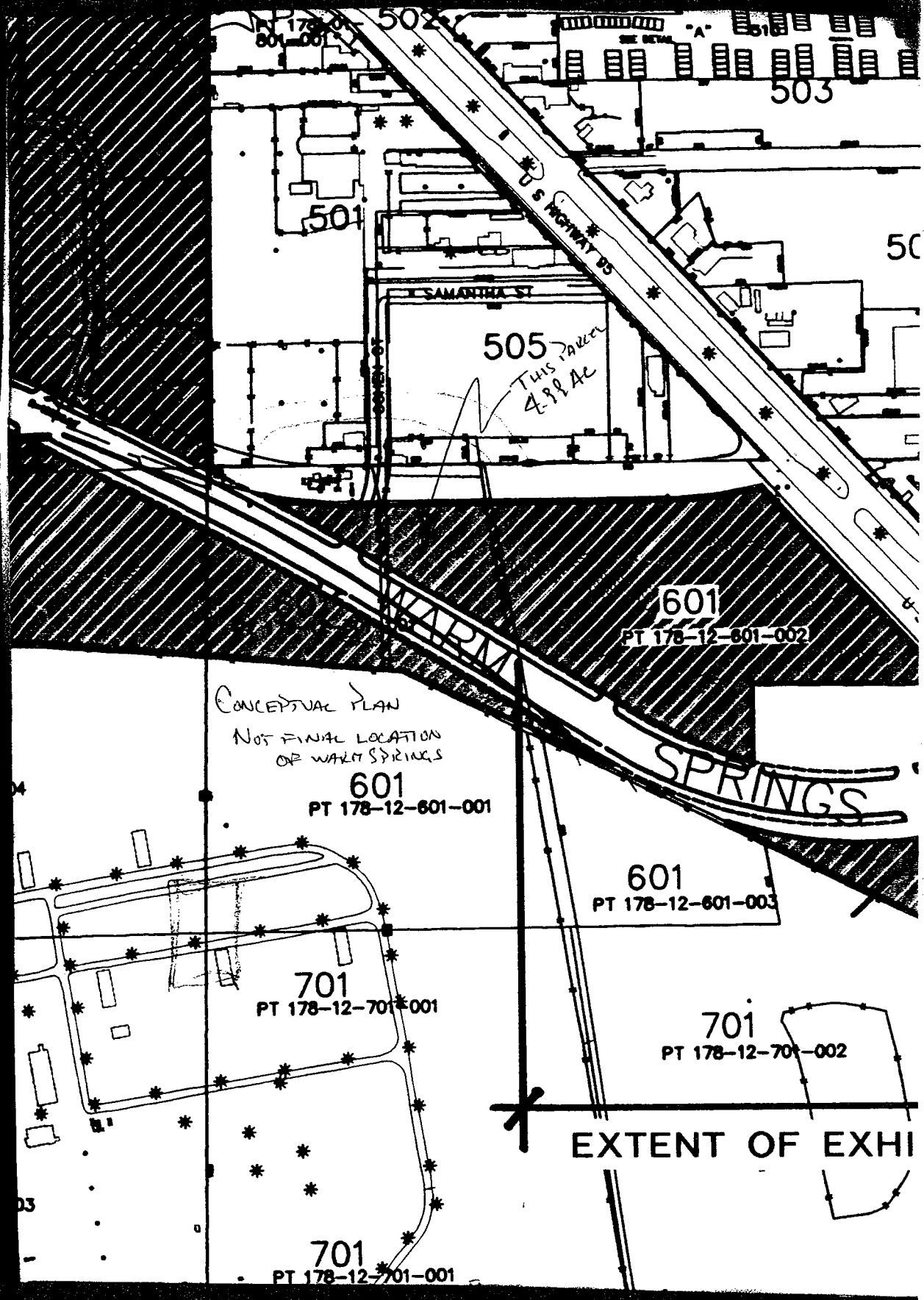
LINE TABLE

No.	BEARING	DISTANCE
L1	S00°55'45"E	5.71'
L2	S89°53'06"E	50.95'
L3	N00°29'56"E	34.48'

N

NOT TO SCALE

SHEET 1 of 2


502
503
501
505
THIS PARCEL 4.88 AC
S SAMANTHA ST
S HIGHWAY 95
601
PT 178-12-601-002
WARM SPRINGS
CONCEPTUAL PLAN
NOT FINAL LOCATION OF WARM SPRINGS
601
PT 178-12-601-001
601
PT 178-12-601-003
701
PT 178-12-701-001
701
PT 178-12-701-002
701
PT 178-12-701-001
EXTENT OF EXHI

1 cmec

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

December 16, 1997

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlman:

Subject: Perchlorate Monthly Activity Status

Following is the current status of Kerr-McGee Chemical Corporation's activities regarding the perchlorate issue:

- KMCC prepared a Work Plan for off-site characterization and submitted this for NDEP review and approval November 1, 1997. Portions of this Work Plan will be accomplished jointly with American Pacific.
- KMCC is preparing a report describing soil sampling at the Henderson facility to evaluate the impact of perchlorate on stormwater discharges to the Pittman Bypass.
- KMCC has initiated an investigation into remedial alternatives for reduction of perchlorate concentrations in water. A status summary of that investigation is attached and several treatment technologies are under continued evaluation.

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,

Susan M. Crowley
Staff Environmental Specialist

By certified mail
cc: KBailey
PBDizikes
ALDooley
RHJones
RANapier
TWReed
EMSpore
Robert Kelso (NDEP)
Doug Zimmerman (NDEP)

smc\Status to Pohlmann121297.doc

Technology Review

Biodegradation

The use of bacteria has been shown to reduce perchlorate and chlorate in water up to 15,000 ppm from bench scale to pilot scale. This technology is patented by the USAF, and the transition to the private sector is under way. Patents in progress and pending in the private sector will make the industrial use of this technology easier. Treatability and operability testing is continuing with bench scale testing scheduled for completion during January 1998. The characterization of locally available nutrients is also being completed. Pending successful testing of locally available nutrients, a decision will be made regarding the scale up engineering and development.

Catalytic Hydrogen Reduction

Hydrogen catalysis is a rather large body of scientific study. Hydrogen ion can be used to reduce chlorate and perchlorate in a catalysis reactor. Preliminary testing of this technology has shown that it is not successful at common operating conditions. Additional testing of this technology will not be completed.

Electrochemical Reduction

Utilizing proper current densities reduction of perchlorate and chlorate ions could be effected in an electrochemical cell. Chlorate reduction has been shown to occur on an iron cathode under the right environmental conditions. Perchlorate may also be reduced with the proper selection of cathode materials, such as tin, and precious metals, with minimal environmental effects. The use of a catalytic cathode has been shown to be successful in reducing the perchlorate and chlorate ions in the groundwater. Further work is underway to determine diffusion limits, control, and design parameters necessary for scale up. This preliminary phase work is expected to continue through February. If these tests are successful, then further evaluation and scale up may be made.

Reverse Osmosis

Reverse Osmosis (RO) may be used to remove the chlorate and perchlorate from the groundwater. This is not a destruction technology and will have to be operated in concert with another destruction process. It is possible that the use of reverse osmosis membranes can be used with electrochemical reduction to effect concentration of chlorate and perchlorate for final reduction. Testing has been concluded. Through multiple stages of RO, the perchlorate is reduced to about 140 ppm. This does not appear to be sufficiently low to achieve the desired effect in the groundwater as a stand alone technology. This may be used in conjunction with another technology, depending on testing results of other technologies.

Ozonation

Ozonation has been tested and does not produce any detectable results.

Granular Activated Carbon

Granular Activated Carbon (GAC) has been used semi-successfully at a water treatment plant in Southern California for removal of perchlorate from well water. The mechanism of this process is unknown, although speculation is that bacteria from groundwater is attaching itself to the organic carbon and reaction with perchlorate is a secondary reaction at the surface of the carbon. Tests using activated carbon have shown equivalent results to Reverse Osmosis. The perchlorate was reduced to approximately 140 ppm in the effluent. The amount of activated carbon required is very large. The activated carbon process may also be used in conjunction with other technology if required.

OSMONICS

CORPORATE HEADQUARTERS

5951 Clearwater Drive
Minnetonka, MN 55343-8995 USA

Phone (612) 933-2277
Fax (612) 933-0141

November 11, 1997

CONFIRMATION COPY

VIA FAX: (702) 651-2250 & MAIL

Mr. Everette Spore
KERR MCGEE CHEMICAL CORPORATION
8000 West Lake Mead Drive
Henderson, NV 89015

Re: Application Test Report

Dear Mr. Spore:

Attached is a copy of the Kerr McGee's Application Test Report and results from the test performed on 24 Sep 97. The purpose of this test is to remove perchlorates from a groundwater source.

Initial results indicate that a 2-pass reverse osmosis (RO) system with CA membrane, followed by DI or activated carbon would be the best option to remove perchlorates. The 2-pass RO reduced the perchlorate levels from 3400 ppm to 133 ppm. Anion resin further reduced the levels to 1.2 ppm. Activated carbon reduced the feed from 3400 ppm to 160 ppm.

At this time, we feel that a pilot unit would be beneficial for further testing. With the pilot unit, we can optimize rejection and flow schemes. As mentioned in our letter of 17 Oct 97, Osmonics can provide a two month study for $35,000-40,000.

cont...

If you would like to proceed with this study or have any questions on the report, please call me at (800) 848-1750, ext. 6446, or David Nicholls at (714) 362-0088.

Sincerely,

OSMONICS, INC.

Matthew E. Hofacre
Application Engineer
Engineered Products & Systems

MEH/seb

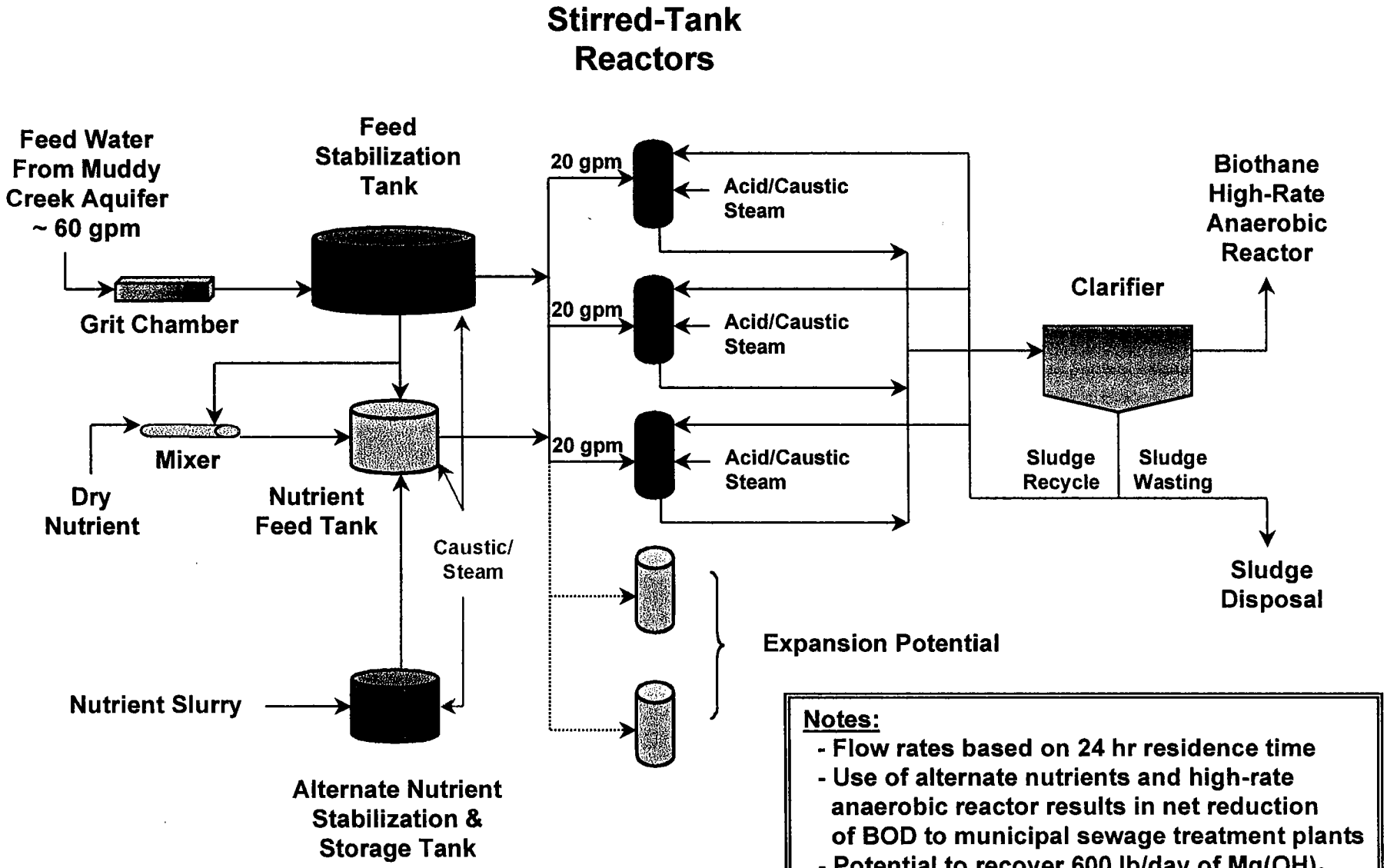
Attach: Application Test Report

cc: Mr. David J. Nicholls, Sales Engineer, Engineered Products & Systems, OSMONICS, INC.
Mr. Owen K. Hopkins, Application Development Engineer, OSMONICS, INC.

Appendix IV

Biochemical Flow Sheets

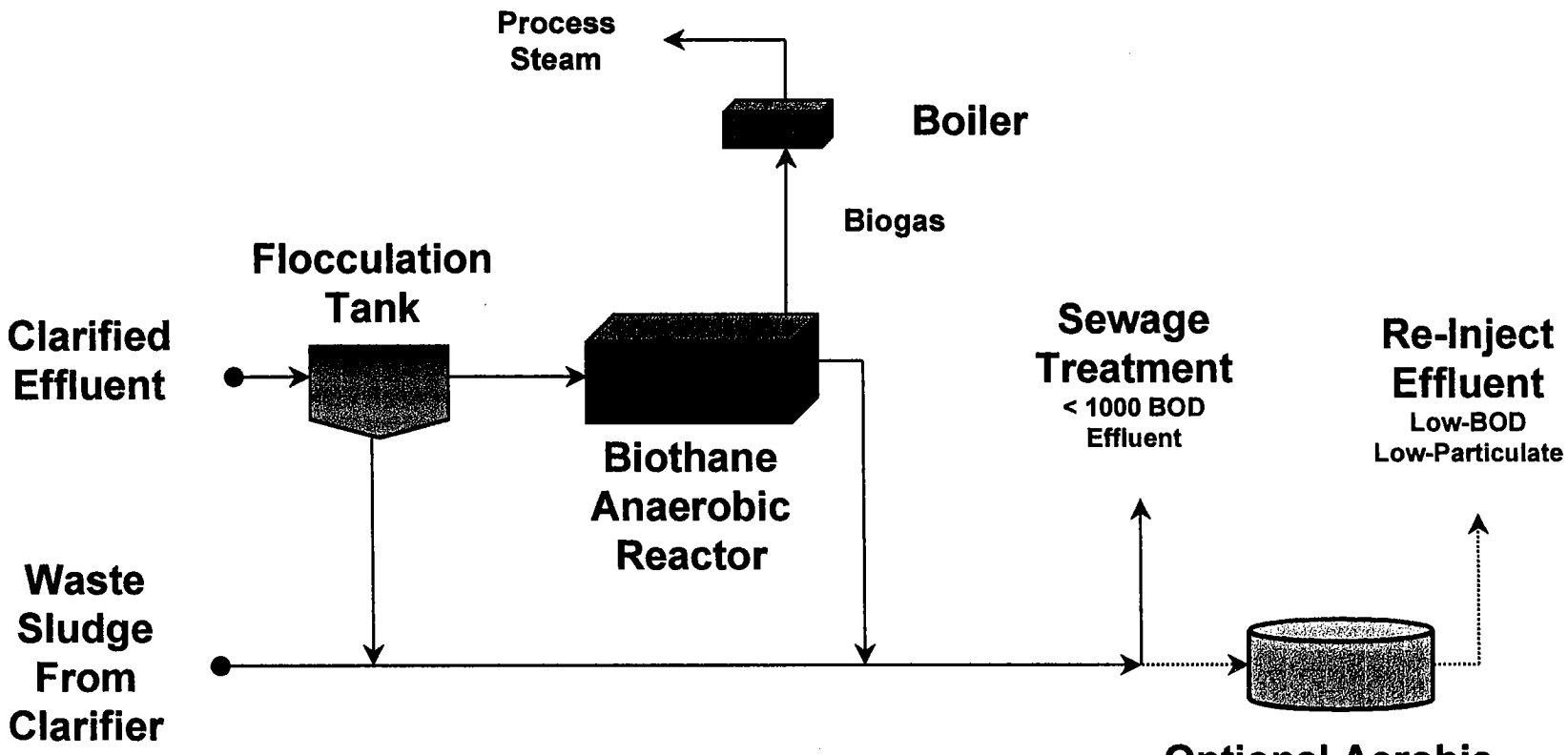
Perchlorate Biodegradation Process



Notes:

- Flow rates based on 24 hr residence time
- Use of alternate nutrients and high-rate anaerobic reactor results in net reduction of BOD to municipal sewage treatment plants
- Potential to recover 600 lb/day of $Mg(OH)_2$

Effluent BOD Reduction Process



Notes:

- Biogas is Sufficient to Provide all Process Heat
- High BOD Reduction Enables Disposal of Sludge to Sewer
- Aerobic Treatment Option Enables Re-Injection of Effluent

Appendix V

Biochemical Technical Publications

10/30/97
Ken McGee Meeting
Pat Corbett, Susan Crowley
Brenda Pohlman

- Have been working w/ Bob Broadbent. Has a lot of personal knowledge about salinity studies
- 6th will work for Metropolitan Water District
- Want to have meeting in CC w/ Lew, Allen, Doug, + me + Bill Grey.
- Working w/ local business to obtain nutrient sources & they are having Applied Research to test nutrients
- Looking at ~~the~~ daily distillation of water - reduce volume of waste that needs to be treated.

1 cm cc

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

October 28, 1997

Mr. Robert Kelso
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Kelso:

Subject: KMCC Environmental Conditions Investigation Quarterly Report

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Kerr-McGee Chemical Corporation (KMCC), KMCC submits the following quarterly progress report for the KMCC Henderson Environmental Conditions Investigation.

Activities Conducted 07/01/97 to 09/30/97

The Phase II Report "Phase II Environmental Conditions Assessment at Kerr-McGee Chemical Corporation, Henderson, Nevada," dated August 1997, was submitted to NDEP.

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

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By certified mail
cc: GDChristiansen
PSCorbett
PBDizikes
RHJones
HISSC Technical Subcommittee
HISSC Legal Subcommittee
RANapier
TWReed
RSimon (ENSR)
JTSmith (Covington & Burling)
Doug Zimmerman (NDEP)

SMC\Quarterly (10-97) Progress Report to Kelso.doc

BIODEGRADATION OF AMMONIUM PERCHLORATE: OPERATIONAL IMPLEMENTATION

James A. Hurley
Air Force Armstrong Laboratory (AL/EQ)
139 Barnes Drive, Suite 2
Tyndall AFB, FL 32403
Telephone: (904) 283-6243
Telefax: (904) 283-6064
E-Mail: jim_hurley@ccmail.aleq.tyndall.af.mil

Edward N. Coppola
Applied Research Associates
Tyndall AFB, FL 32403

ABSTRACT

Ammonium Perchlorate (AP) is the primary solid rocket propellant oxidizer used in boosters for the Minuteman, Peacekeeper, Shuttle, Titan, and other major strategic, tactical and space systems. Propellant manufacture, testing, and disposal activities generate large quantities of AP contaminated waste water. The EPA recently proposed a preliminary reference dose for ammonium perchlorate that could regulate aqueous discharges to less than one ppm. In response to this problem a very robust and cost-effective biodegradation process has been developed by Armstrong Laboratory's Environics Directorate and its support contractor Applied Research Associates. In this process the perchlorate ion is biologically reduced to chloride. Aqueous solutions of perchlorate up to 1.5% can be treated to below the detectable limit (< 0.5 ppm). In 1995 a continuous-flow pilot system capable of treating up to 1000 gallons per day of effluent was designed, fabricated, and successfully tested at Tyndall AFB, Florida. In 1996 optimization studies were accomplished to transition this process to industry. Through a Cooperative Research and Development Agreement (CRDA) with Thiokol Corporation, Defense and Launch Vehicle Division, this process is being modified to treat perchlorate waste water containing salts, corrosion inhibitors, and other contaminants. A production-scale biodegradation process will be integrated into existing waste treatment processes at Thiokol's production facility near Brigham City, Utah, and will be operated by Thiokol under the CRDA. The capacity of the production-scale system will be over 3000 gallons per day, depending on perchlorate and salt concentration, and will directly complement other perchlorate recovery and reuse operations. The production-scale implementation of this process represents the culmination of six years of research and development efforts sponsored by the Air Force, the Joint Ordnance Commanders Group, and the Environmental Security Technology Certification Program Office.

INTRODUCTION

This program was initiated in 1989 under the sponsorship of the Air Force Office of Scientific Research (AFOSR) and the Air Force Armstrong Laboratory, Environics Directorate, Tyndall AFB, FL. At that time biodegradation was recognized as a viable process to treat dilute AP waste streams and remediate contaminated soil and ground water. An organism capable of reducing perchlorate was isolated by Attaway and Smith[1] and the bacterium designated HAP-1. Laboratory studies were conducted in batch mode and in continuous stirred tank reactors (CSTRs). The process variables that affect perchlorate reduction performance were addressed in laboratory studies. These included temperature, pH, nutrient

RECENT DISCOVERIES

Laboratory efforts have culminated in the positive identification of the specific genus and species of the bacterium responsible for perchlorate reduction as *Wolinella succinogenes*[2]. This has enabled us to take advantage of the scientific data and literature on this organism and has led to promising process enhancements. One discovery is the microaerophilic nature of *Wolinella succinogenes*. This means that this organism may prefer small concentrations of oxygen or that oxygen could compete with perchlorate reduction as an alternate electron acceptor. Previously it was assumed that oxygen did not play a critical part in perchlorate reduction because other microbes in this mixed culture would consume the oxygen to maintain anaerobic conditions. However, when strict anaerobic conditions were maintained using nitrogen, very stable, predictable perchlorate reduction was obtained at rates exceeding 0.5 g/l per hour. In addition, it was successfully demonstrated that the HAP-1 mixed culture can destroy AP and other components of more complex aqueous wastes from class 1.1 propellants containing nitroglycerin, nitramines, stabilizers, and plasticizers. One patent (5,302,285)[3] has been granted on this process. Additional patents are pending.

OPTIMIZATION STUDIES

Additional studies have demonstrated that this biodegradation process is much more durable, flexible, and predictable than originally perceived. Process optimization efforts have focused on reducing operating cost, tailoring the process variables, and reconfiguring operations to treat representative industrial wastes. These efforts resulted in an increased robustness of the process which can effectively treat effluents containing over 1.5 percent (15,000 ppm) perchlorate. Perchlorate can also be reduced in effluents with a high salt content (> 2.3 % Na^+, K^+, Cl^-), other impurities (NO_2^-, NO_3^-, $SO_4^{=}$), and over a broad temperature range (20-40°C). Lower cost nutrients were successfully demonstrated that significantly lower this primary operating expense. Dried brewer's yeast can be used directly, without extracting the critical nutrients. This increases BOD in the effluent but reduces the total nutrient requirements. Preliminary studies have shown that dried, sweet cheese whey may also be an effective nutrient by itself or in mixtures with brewer's yeast. The cheese whey is more soluble than brewer's yeast and is only one fourth the cost. Nutrient costs may be reduced even further by using unprocessed yeast and cheese whey wastes.

OPERATIONAL IMPLEMENTATION

Industrial applications were evaluated and a waste stream at the Thiokol Corporation was targeted for further testing. This effluent was a brine containing perchlorate, nitrates, and nitrites. The laboratory studies described above indicated that the perchlorate in this effluent could be effectively treated. In order to demonstrate performance at a larger scale, the existing pilot plant was modified to enable operation of the larger (720 gallon), aerobic reactor as an anaerobic reactor. A nitrogen generation system was used to control anaerobic conditions. The perchlorate in a high salt (>2.3% with NO_2^- and NO_3^- impurities), low perchlorate (1000 ppm) effluent was easily reduced to below detectable limits at 35°C and 24 hour residence time using low-cost, whole brewer's yeast and cheese whey nutrients. A summary of the test conditions and results are provided in Table 1. Condition #1 is the start-up condition on yeast extract (BYF-100). The perchlorate concentration in the feed was elevated and the salt concentration kept low. Condition 2 represents operational levels of perchlorate and salt. At condition #3 the nutrient was switched to dried, whole brewer's yeast. At condition #4 a corrosion inhibitor was added to the feed to determine the effects of nitrite and nitrate on perchlorate and anion reduction. At condition #5 the nutrient was switched to a blend of 75% dried, sweet cheese whey and 25% dried brewer's yeast. Condition #7 was a dormancy test to determine if the ability of HAP-1 to reduce perchlorate could be retained over an extended period of time without perchlorate in the feed. Condition

#8 demonstrated that the original perchlorate reducing capability of the microbes could be re-established in less than two days.

TABLE 1. SUMMARY OF HIGH-SALT, PILOT-PLANT TESTS

Condition ID	1	2	3	4	5	6	7	8
Days Operated	7	11	6	7	7	7	14	7
Residence Time, hours	24-48	24	24	24	24	24	360	24
Feed Composition (Avg.)								
ClO_4^-, ppm	2433	1366	1112	1053	1224	1011	0	2727
NO_2^-, ppm	0	0	0	391	559	0	0	
NO_3^-, ppm	0	57	14	137	157	0	0	
BYF-100, g/l	7.04	3.02					30	113.4
Dried yeast, g/l			4.04	3.97				
Whey + 25% yeast, g/l					4.01	3.99		
Nutrient Ratio (N:AP)	2.89	2.21	3.63	3.77	3.28	3.95	-	4.91
Total salts, wt%	0.23	2.3	2.3	2.3	2.3	2.3	< 2.3	~0.9
Effluent Analysis (Avg.)								
ClO_4^-, ppm	0	0	0	0	0	6	-	0
NO_2^-, ppm	0	0	2	34	0	0		
NO_3^-, ppm	2	3	3	5	3	0		
COD, ppm				3400	4340	4340		6020

PROTOTYPE DEMONSTRATION

A contract was awarded to Applied Research Associates and Case Engineering, the engineering and construction firm who built the existing pilot plant. Under this contract the existing pilot system is being redesigned and modified. This new production-scale system will undergo testing at Tyndall AFB before being shipped to Thiokol and integrated into existing wastewater treatment facilities for demonstration and validation. As part of the CRDA with the Air Force Armstrong Laboratory, Thiokol will conduct a two-year operational validation of this technology. During the validation, performance will be reported and data made available to all interested government and industrial parties. A schematic of the Thiokol production-scale system is shown in Figure 2. At the time of this writing, the redesign and modifications were complete. The system is currently undergoing functional testing on actual Thiokol effluents at Tyndall AFB.

OPERATING COST

The most attractive aspect of ammonium perchlorate biodegradation is the low operating and investment costs. The Figure 3 clearly shows that operating costs to treat dilute perchlorate effluents are very acceptable. These costs are based on actual and predicted costs for all of the components shown. As the concentration of perchlorate increases, operating costs increase almost linearly due to decreased capacity and increased nutrient requirements. The implication is that at high concentrations of perchlorate, recovery may become a more cost-effective approach. However, even recovery processes will directly benefit from this low-cost method of treating their by-product streams and mixed or contaminated perchlorate wastes.

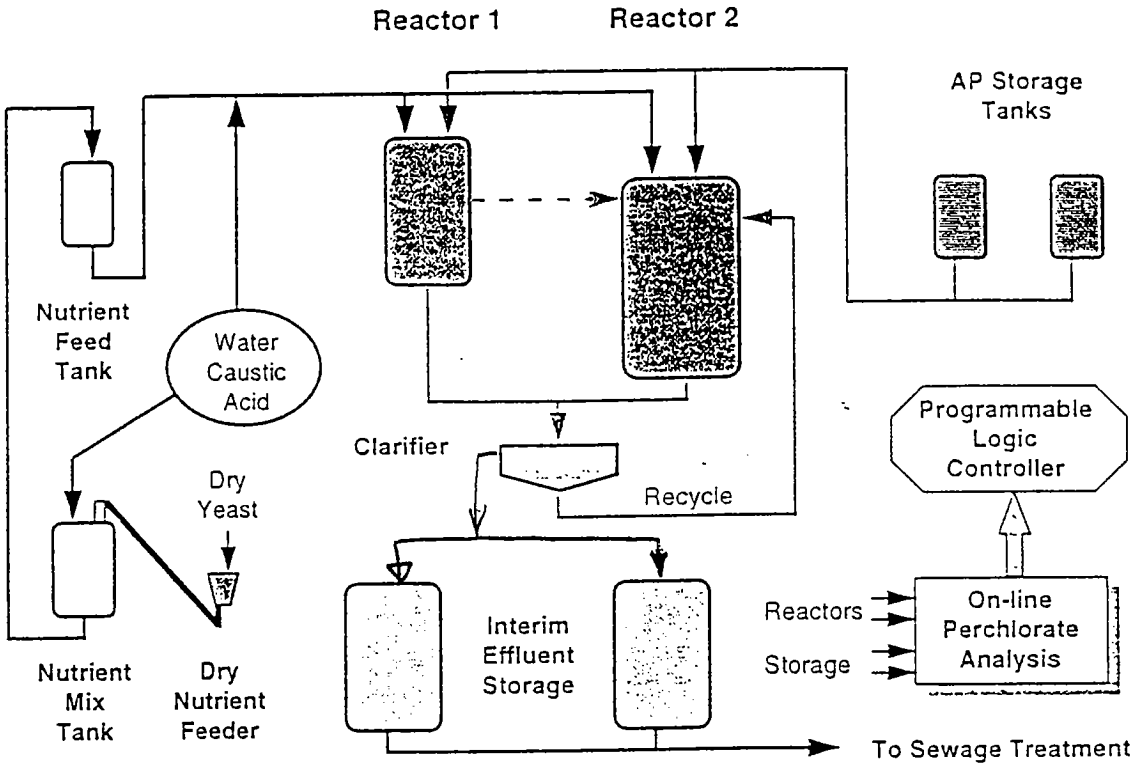


Figure 2. Schematic of the Thiokol production-scale system.

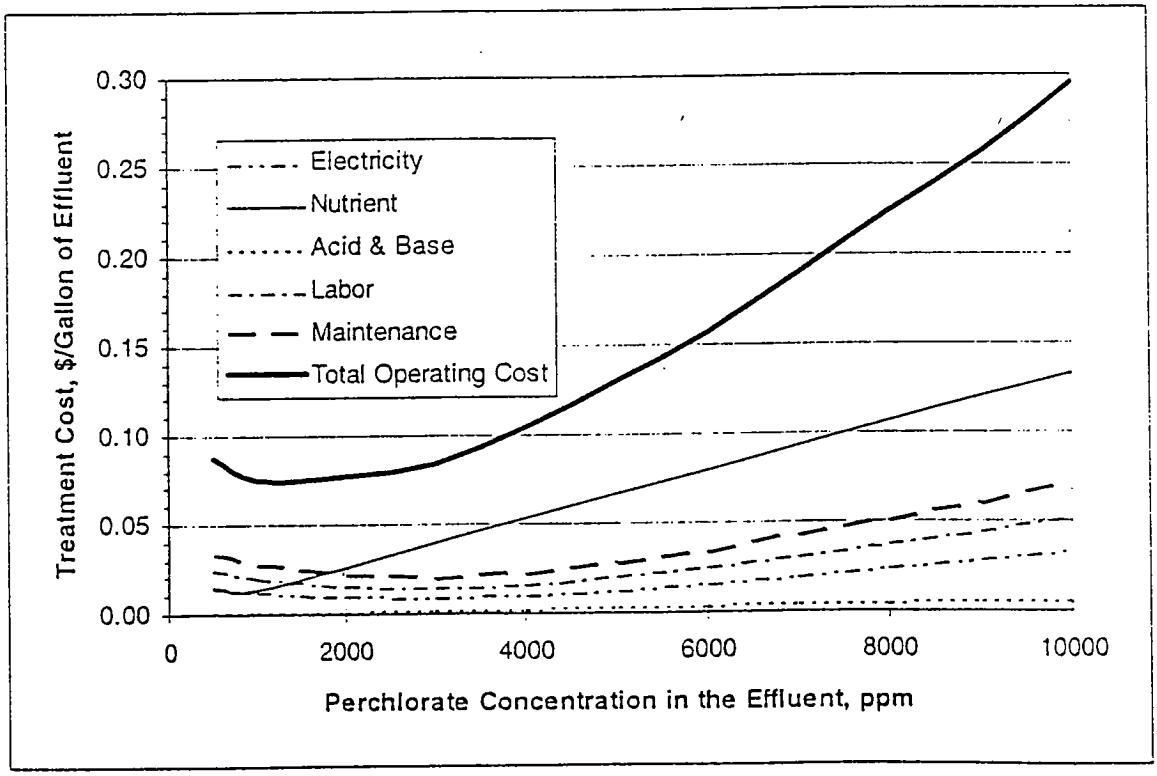


Figure 3. Projected operating costs for the Thiokol production-scale system.

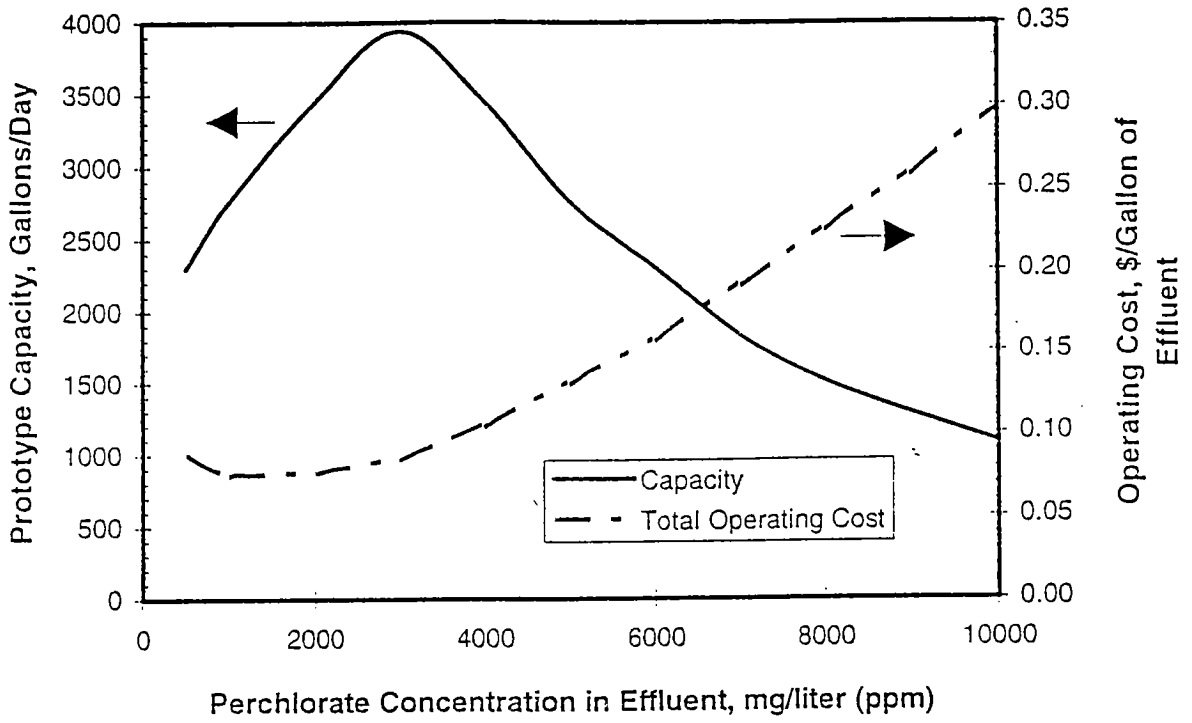


Figure 4. Capacity of the Thiokol production-scale system as a function of perchlorate concentration.

Figure 4 shows that the treatment capacity of the Thiokol production-scale system is near maximum when the perchlorate concentration in the effluent is in the 3000-4000 ppm range. At this concentration the elevated nutrient requirement results in efficient microbial growth and high perchlorate reduction rates. At lower perchlorate concentrations less nutrient is used. This lowers the perchlorate reduction rate resulting in increased residence time and decreased throughput. Higher perchlorate concentrations require increased residence time to reduce the additional perchlorate. Above 6000 ppm perchlorate, the system is operated in the series mode and overall residence time is increased further in order to accomplish complete reduction of the perchlorate ion.

CONCLUSION

The Silo-Based ICBM Systems Program Office (SBICBM SPO) has planned and programmed for the remanufacture of the Minuteman III propulsion systems. Preliminary engineering and development programs are in progress. The SPO has already decided to reuse the stage 1 and 2 motor cases which would result in saving the production program an estimated $1-2 billion. Water washout of the solid propellant is the accepted, safe method to accomplish this case recovery and has been proposed for stage 1 remanufacture. The ability to safely recover and dispose of over 6 tons of propellant per day, on a continuous basis, is critically important to the success of the Minuteman III remanufacture program. In addition, the Titan Program Office recently awarded a contract to Thiokol to washout up to 57 Titan solid rocket booster segments (over 4 million pounds of propellant). This program is also dependent on propellant and component recovery that is made possible by the ability to dispose of dilute perchlorate waste streams through the implementation of this biodegradation process. In addition, production of

other rocket motors at Thiokol, including the Space Shuttle Solid Rocket Motor segments, will directly benefit from the implementation of this process.

The process described in this paper is a proven, low-cost approach to addressing the many perchlorate treatment needs brought about by more stringent and widespread environmental regulation. Disposal of ammonium perchlorate from production, remanufacturing, test and evaluation, and remediation is currently an industry wide problem. The ability to effectively biodegrade dilute ammonium perchlorate wastes will enable continued use of this critical defense material in both rocket motors and ordnance items.

REFERENCES

1. Attaway, H., and Smith, M. 1993. "Reduction of Perchlorate by an Anaerobic Enrichment Culture." Journal of Industrial Microbiology. 12: 408-412

2. Wallace, W., Ward, T., Breen, A., Attaway, H. 1996 "Identification of an Anaerobic Bacterium Which Reduces Perchlorate and Chlorate as *Wolonella succinogenes*." Journal of Industrial Microbiology. 16: 68-72

3. United States Patent 5,302,285. "Propellant Wastewater Treatment Process." April 12, 1994

from Jim Cornette

Biodegradation of Ammonium Perchlorate: Operational Implementation

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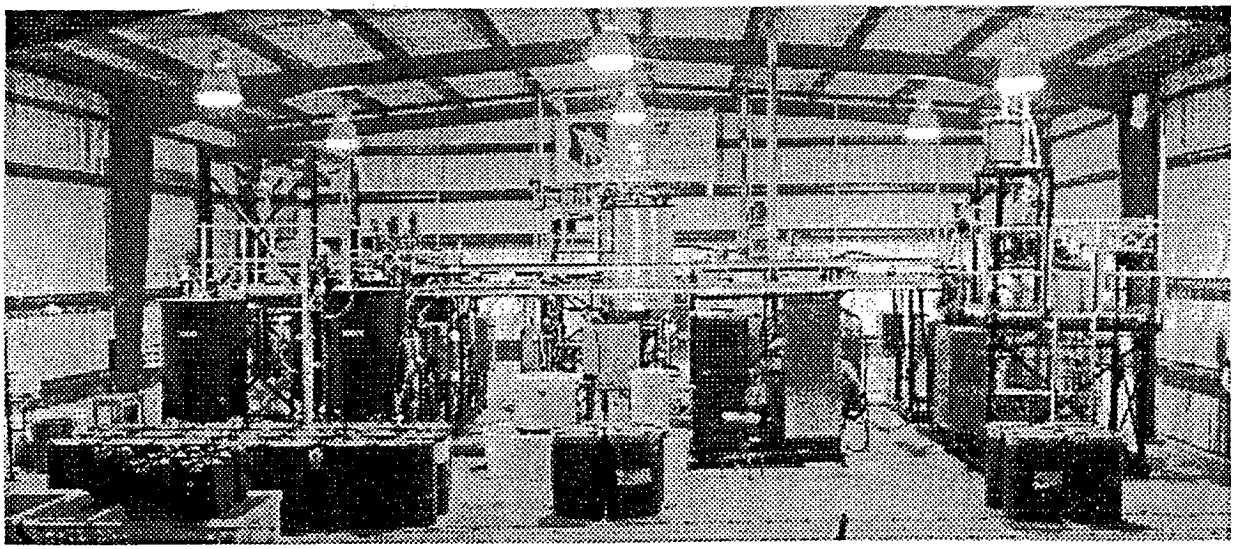
Abstract: Ammonium Perchlorate (AP) is the primary solid rocket propellant oxidizer used in boosters for the Minuteman, Peacekeeper, Shuttle, Titan, and other major strategic, tactical and space systems. Propellant manufacture, testing, and disposal activities generate large quantities of AP contaminated waste water. The EPA recently proposed a preliminary reference dose for ammonium perchlorate that could regulate aqueous discharges to less than one ppm. In response to this problem a very robust and cost-effective biodegradation process has been developed by Armstrong Laboratory's Environics Directorate and its support contractor Applied Research Associates. In this process the perchlorate ion is biologically reduced to chloride. Aqueous solutions of perchlorate up to 1.5% can be treated to below the detectable limit (< 0.5 ppm). In 1995 a continuous-flow pilot system capable of treating up to 1000 gallons per day of effluent was designed, fabricated, and successfully tested at Tyndall AFB, Florida. In 1996 optimization studies were accomplished to transition this process to industry. Through a Cooperative Research and Development Agreement (CRDA) with Thiokol Corporation, Defense and Launch Vehicle Division, this process is being modified to treat perchlorate waste water containing salts, corrosion inhibitors, and other contaminants. A full-scale biodegradation process will be integrated into existing waste treatment processes at Thiokol's production facility near Brigham City, Utah, and will be operated by Thiokol under the CRDA. The capacity of the full-scale system will be over 3000 gallons per day, depending on perchlorate and salt concentration, and will directly complement other perchlorate recovery and reuse operations. The full-scale implementation of this process represents the culmination of six years of research and development efforts sponsored by the Air Force, the Joint Ordnance Commanders Group, and the Environmental Security Technology Certification Program Office.

Background: This program was initiated in 1989 under the sponsorship of the Air Force Office of Scientific Research (AFOSR) and the Air Force Armstrong Laboratory, Environics Directorate, Tyndall AFB, FL. At that time biodegradation was recognized as a viable process to treat dilute AP waste streams and remediate contaminated soil and ground water. An organism capable of reducing perchlorate was isolated by Attaway and Smith (1993, Reduction of Perchlorate by an Anaerobic Enrichment Culture, Journal of Industrial Microbiology, 12:408-412) and the bacterium designated HAP-1. Laboratory studies were conducted in batch mode and in continuous stirred tank reactors (CSTRs). The process variables that affect perchlorate reduction performance were addressed in laboratory studies. These included temperature, pH, nutrient type, nutrient concentration, residence time, and perchlorate ion concentration. Nutrients had to be commercially available, relatively low cost, and demonstrate good performance with respect to

perchlorate reduction. The most promising nutrients were dried brewer's yeast and yeast extracts. Typical treatment conditions identified were:

Temperature	37-42°C
pH	6.5-7.6
Residence Time	8-24 hours
Perchlorate Concentration	< 6000 ppm
Degradation Rates	125 mg/l per hr

Pilot Plant Demonstration: The results of the laboratory studies were used to design, fabricate, and demonstrate the operability of a complete AP biodegradation system using actual effluent from the wash out of Minuteman stage 2 propellant by the Aerojet Propulsion Division. The design of the pilot-scale system was centered around a 350 gallon anaerobic reactor capable of treating up to 1000 gallons per day of dilute AP waste water. A new facility was constructed to house the pilot bioreactor system at the Tyndall AFB, Florida. Construction of the pilot system was performed by Case Engineering, Lakeland, Florida. The modular designed, skid mounted pilot system was delivered to Tyndall AFB in October 1994 on three trailers and completely assembled in only one week. The entire system, shown in the picture below, occupies a 40 ft by 52 ft concrete pad that is enclosed on three sides. In May 1995, the pilot system was operated in the continuous mode for over 600 hours using an extract prepared from dried brewer's yeast to reduce a 3000 ppm perchlorate feed to less than the detectable limit. The pilot system was also operated for over 900 hours, at residence times as short as 12 hours, on a commercially available, water-soluble yeast extract called BYF-100. Both nutrients performed well. The BYF-100 nutrient is more expensive than dried brewer's yeast but, also, more efficient and can result in a lower biological oxygen demand (BOD) for the effluent.



Recent Discoveries: Laboratory efforts have culminated in the positive identification of the specific genus and species of the bacterium responsible for perchlorate reduction as *Wolinella succinogenes* (W. Wallace et. al., Journal of Industrial Microbiology, (1996) 16, 68-72). This has enabled us to take advantage of the scientific data and literature on this organism and has led to promising process enhancements. One discovery is the microaerophilic nature of *Wolinella*

succinogenes. This means that this organism may prefer small concentrations of oxygen or that oxygen could compete with perchlorate reduction as an alternate electron acceptor. Previously it was assumed that oxygen did not play a critical part in perchlorate reduction because other microbes in this mixed culture would consume the oxygen to maintain anaerobic conditions. However, when strict anaerobic conditions were maintained using nitrogen, very stable, predictable perchlorate reduction was obtained at rates exceeding 0.5 g/l per hour. In addition, it was successfully demonstrated that the HAP-1 mixed culture can destroy AP and other components of more complex aqueous wastes from class 1.1 propellants containing nitroglycerin, nitramines, stabilizers, and plasticizers. One patent (5,302,285) has been granted on this process. Additional patents are pending.

Optimization Studies: Additional studies have demonstrated that this biodegradation process is much more durable, flexible, and predictable than originally perceived. Process optimization efforts have focused on reducing operating cost, tailoring the process variables, and reconfiguring operations to treat representative industrial wastes. These efforts resulted in an increased robustness of the process which can effectively treat effluents containing over 1.5 percent (15,000 ppm) perchlorate. Perchlorate can also be reduced in effluents with a high salt content (> 2.3 % Na^+, K^+, Cl^-), other impurities (NO_2^-, NO_3^-, $SO_4^=$), and over a broad temperature range (20-40°C). Lower cost nutrients were successfully demonstrated that significantly lower this primary operating expense. Dried brewer's yeast can be used directly, without extracting the critical nutrients. This increases BOD in the effluent but reduces the total nutrient requirements. Preliminary studies have shown that dried, sweet cheese whey may also be an effective nutrient by itself or in mixtures with brewer's yeast. The cheese whey is more soluble than brewer's yeast and is only one fourth the cost. Nutrient costs may be reduced even further by using unprocessed yeast and cheese whey wastes.

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Summary of High-Salt, Pilot-Plant Tests

Condition ID	1	2	3	4	5	6	7	8
Days Operated	7	11	6	7	7	7	14	7
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Avg. Feed Composition								
ClO_4^-, ppm	2433	1366	1112	1053	1224	1011	0	2727
NO_2^-, ppm	0	0	0	391	559	0	0	
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BYF-100, g/l	7.04	3.02					30	113.4
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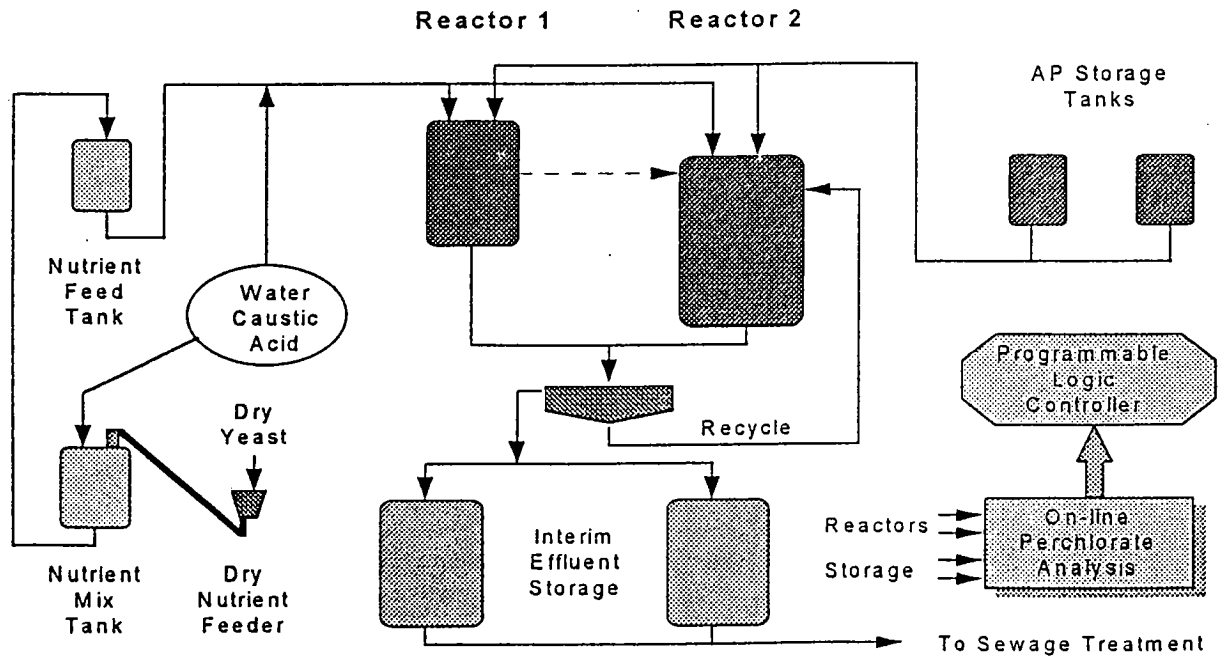
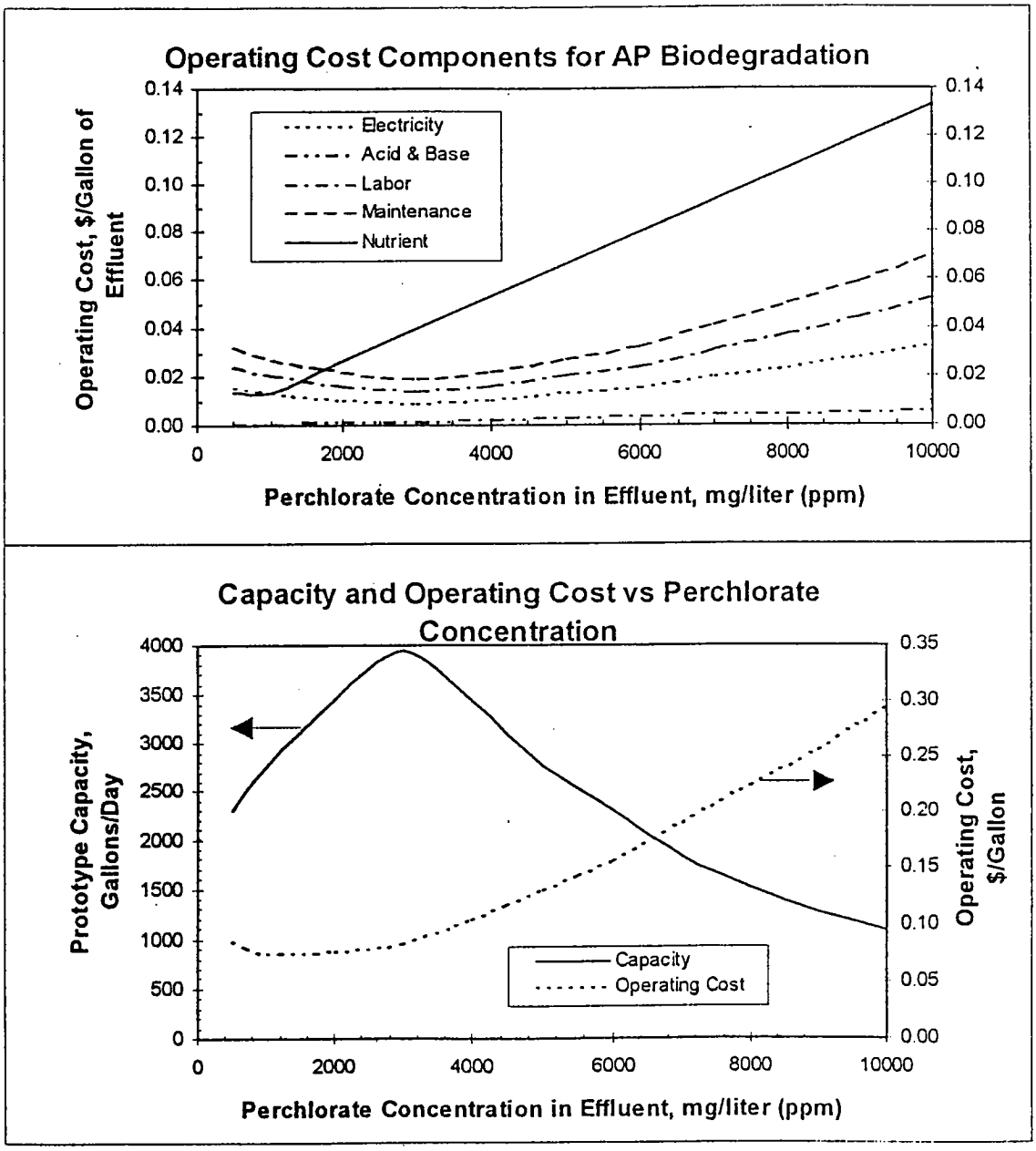
Whey + 25% yeast, g/l					4.01	3.99		
Nutrient Ratio (N:AP)	2.89	2.21	3.63	3.77	3.28	3.95	-	4.91
Total salts, wt%	0.23	2.3	2.3	2.3	2.3	2.3	< 2.3	~0.9
Average Effluent Analysis								
ClO_4^-, ppm	0	0	0	0	0	6	-	0
NO_2^-, ppm	0	0	2	34	0	0		
NO_3^-, ppm	2	3	3	5	3	0		
COD, ppm				3400	4340	4340		6020

Prototype Demonstration: A contract was awarded to Applied Research Associates and Case Engineering, the engineering and construction firm who built the existing pilot plant. Under this contract the existing pilot system is being redesigned and modified. This new prototype system will undergo testing at Tyndall AFB before being shipped to Thiokol and integrated into existing wastewater treatment facilities for demonstration and validation. As part of the CRDA with the Air Force Armstrong Laboratory, Thiokol will conduct a two-year operational validation of this technology. During the validation, performance will be reported and data made available to all interested government and industrial parties. A schematic of the Thiokol prototype is shown below.

Ammonium Perchlorate Biodegradation Prototype at Thiokol



Operating Cost: The most attractive aspect of ammonium perchlorate biodegradation is the low operating and investment costs. The graphs below clearly show that operating costs for dilute perchlorate effluents are very acceptable. These costs are based on actual and predicted costs for all of the components shown. As the concentration of perchlorate increases, operating costs increase almost linearly due to decreased capacity and increased nutrient requirements. The implication is that at high concentrations of perchlorate, recovery may become a more cost-effective approach. However, even recovery processes will directly benefit from this low-cost method of treating their by-product streams and mixed or contaminated perchlorate wastes.



Conclusion: The Silo-Based ICBM Systems Program Office (SBICBM SPO) has planned and programmed for the remanufacture of the Minuteman III propulsion systems. Preliminary engineering and development programs are in progress. The SPO has already decided to reuse the stage 1 and 2 motor cases which would result in saving the production program an estimated $1-2 billion. Water washout of the solid propellant is the accepted, safe method to accomplish this case recovery and has been proposed for stage 1 remanufacture. The ability to safely recover and dispose of over 6 tons of propellant per day, on a continuous basis, is critically important to the success of the Minuteman III remanufacture program. In addition, the Titan Program Office recently awarded a contract to Thiokol to washout up to 57 Titan solid rocket booster segments (over 4 million pounds of propellant). This program is also dependent on propellant and component recovery that is made possible by the ability to dispose of dilute perchlorate waste streams through the implementation of this biodegradation process. In addition, production of other rocket motors at Thiokol, including the Space Shuttle Solid Rocket Motor segments, will directly benefit from the implementation of this process. The ability to effectively biodegrade dilute ammonium perchlorate wastes will enable continued use of this critical defense material.

Perchlorate Biodegradation Technology: Multiple Applications

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ABSTRACT

A very robust and cost-effective biodegradation process was developed that reduces the perchlorate ion (ClO_4^-) to chloride (Cl^-). Applied Research Associates designed and fabricated a prototype system for the Air Force Research Laboratory's Environmental Technology Development Branch and integrated the system into an existing waste treatment plant at Thiokol Corporation's production facility near Brigham City, Utah. Since 8 December 1997, Thiokol has used this prototype to treat actual wastewater from production and demilitarization operations. This wastewater contains perchlorate, salts, corrosion inhibitors, and other contaminants. The ability of this process to destroy dilute perchlorate in complex waste streams directly contributes to the success of Thiokol's ammonium and potassium perchlorate recovery and reuse operations. This success has also led to many new applications. Treatability studies have been conducted on highly contaminated ground water. These studies showed that perchlorate could be successfully reduced in complex brine wastes that contained many competing ions. Chlorate (ClO_3^-), nitrate (NO_3^-), nitrite (NO_2^-), and chromium (VI), were reduced simultaneously with perchlorate. Treatability studies were also conducted on simulated RDX hydrolysate with promising results. The potential applications of this process to wastewater generated from energetic (hazard class 1.1) propellant and pyrotechnic operations appear unlimited. Another potential application is the destruction of the water-soluble constituents in smoke formulations. A biological process that can destroy the oxidizer salts (ClO_3^-) and soluble organics (sugar, lactose) in smokes will greatly simplify disposal processes.

BACKGROUND

A program to develop biodegradation technology for perchlorate was initiated in 1989 under sponsorship of the United States Air Force. At that time biodegradation was recognized as a viable process to treat dilute AP waste streams and treat contaminated ground water. Attaway and Smith[1] isolated an organism capable of reducing perchlorate and designated the bacterium HAP-1. Laboratory studies were conducted in batch and continuous stirred tank reactors (CSTRs). The process variables that affect perchlorate reduction performance were addressed in these studies. Variables included temperature, pH, nutrient type, nutrient concentration, residence time, and perchlorate ion concentration. Other laboratory efforts culminated in the positive identification of the bacterium responsible for perchlorate reduction as *Wolinella succinogenes*[2]. This identification has enabled us to take advantage of the scientific data and literature on this organism and further optimize the original process. Process enhancements resulted in very stable, predictable perchlorate reduction rates exceeding 0.5 g/l per hour. This paper reports on the results or the prototype demonstration to date and on ground water treatability studies. One patent (5,302,285)[3] has been granted on this process. Additional patents are pending.

In 1995, a continuous-flow pilot system capable of treating up to 1000 gallons per day of effluent was designed, fabricated, and successfully tested at Tyndall AFB, Florida. In 1996, optimization studies were accomplished that led to an industrial application. Through a Cooperative Research and Development Agreement (CRDA) with Thiokol Corporation, Defense and Launch Vehicle Division, this process was modified to treat perchlorate wastewater containing salts, corrosion inhibitors, and other contaminants. This prototype biodegradation process was integrated into existing waste treatment processes at Thiokol's production facility near Brigham City, Utah, and is operated by Thiokol under the CRDA. The capacity of this system is over 3000 gallons per day, depending on perchlorate and salt concentration.

PROTOTYPE DEMONSTRATION

This demonstration was conducted in two phases. First, the production-scale transportable system was assembled on an existing test site at Tyndall AFB, Florida, and functional and process evaluations were conducted. Process control and operation were demonstrated with two bioreactors in series and parallel configurations. Upon successful completion of the Tyndall demonstration, the system was disassembled, transported to Thiokol, modified, and reassembled. The validation testing at Thiokol is generating performance and cost data in an integrated industrial waste treatment facility.

Results of the Prototype Demonstration at Tyndall AFB, FL

The redesigned and modified prototype system underwent functional testing at Tyndall AFB, Florida, during the summer of 1997. A schematic of the prototype system is shown in Figure 1.

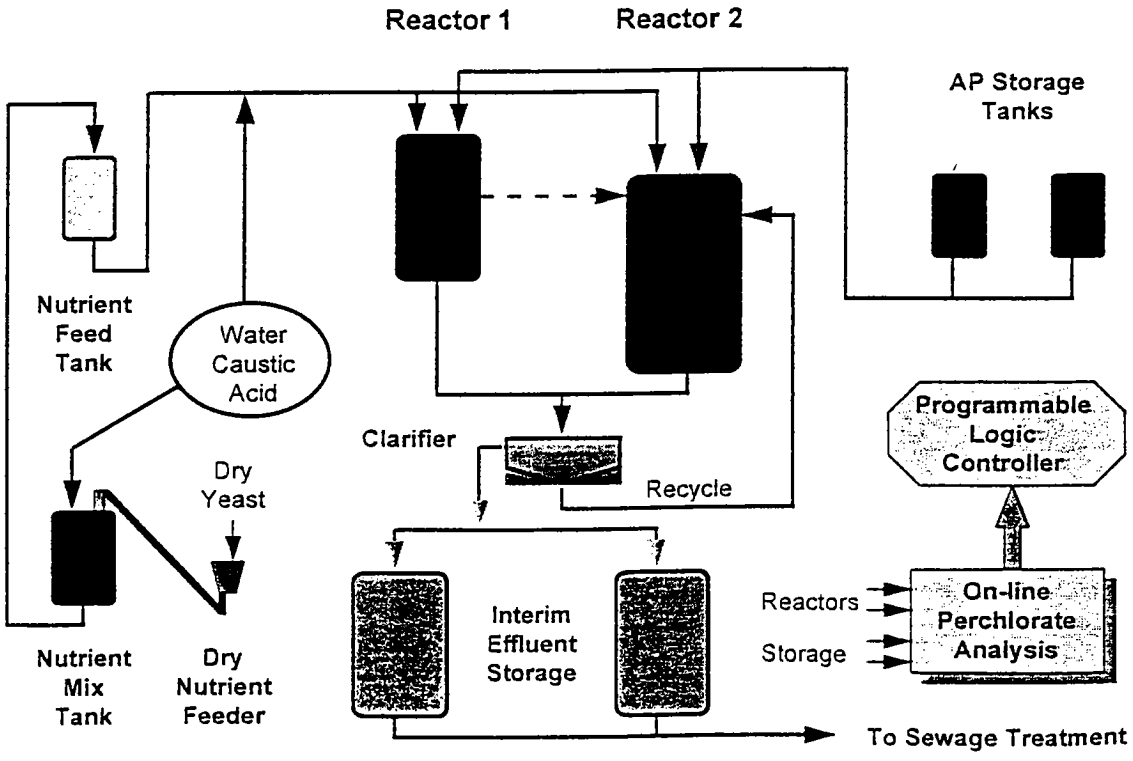


Figure 1. Schematic of the Thiokol Prototype System.

Both parallel and series operations were successfully conducted during the Tyndall demonstration. The inoculum was grown from a lyophilized (freeze-dried) culture, containing *Wolinella succinogenes*, to validate this procedure. A nitrogen generator was used to purge reactor 1 (R-1400) of oxygen to facilitate inoculation. The reactor was charged with approximately 200 gallons of 1000-ppm of ammonium perchlorate solution and nutrient. Temperature and pH were adjusted, and then the inoculum added to the reactor. When the perchlorate concentration began to drop, additional perchlorate and nutrient solution were metered into the reactor. The fill rate of R-1400 was varied to ensure proper inoculation and perchlorate removal. By the time R-1400 was full (720 gallons), the perchlorate was being completely reduced. The effluent from R-1400 was fed to reactor 2, R-1700, along with the additional perchlorate and nutrient necessary to complete the inoculation. The hydraulic volume of R-1700 is approximately 1600 gallons. With both reactors inoculated and accepting feed, parallel operation was initiated. The perchlorate used for the inoculation and start-up was prepared from 10-12% ammonium perchlorate solution from the wash out of Minuteman stage 2 propellant. When both reactors were completely reducing perchlorate, the feed was switched to 10% brine. The composition of the Thiokol brine effluent used in the Tyndall demonstration is provided in Table 1.

Table 1. Composition of Thiokol Brine

Component	Concentration, mg/l	Component	Concentration, mg/l
Perchlorate, ClO_4-	4266	Chloride, Cl-	101,160
Nitrate, NO_3-	4662	Ammonium, NH_4^+	290
Nitrite, NO_2-	299	Total Dissolved Solids	271,000

Dilution of the brine to 10% was necessary because of the very high total dissolved solids in this effluent. Even a 10% solution resulted in a 2.71% salt content in the reactor before nutrient, acid, and caustic additions. Bench-scale studies showed TDS in the 2-3% range would begin to inhibit perchlorate reduction. After start-up on 100% yeast, the nutrient was switched (7/14/97) to a mixture of cheese whey and yeast (75:25). Figures 2 and 3 show the performance of R-1400 and R-1700 respectively. The spike in the perchlorate concentration in the reactors on 7/19/97 was due to the microbial populations adjusting to the high salt concentration and the new nutrient. In R-1400 the feed was temporarily interrupted for one day to aid in the adjustment. However, in R-1700 the feed was continued despite the upset. Both reactors recovered and performed well during the remainder of the parallel operation.

A short test was conducted with the reactors in series. The nutrient was changed to 100% brewer's yeast, which was fed to both reactors. The effluent feed stream was a concentrated ammonium perchlorate solution fed at a rate to simulate 4000 to 6000-ppm into the reactor. Figure 4 shows that the perchlorate is partially reduced in the first reactor and the reduction is completed in the second reactor. However, at three weeks into the study, the perchlorate feed was further increased to 8000 ppm and the nutrient increased accordingly. The temperature began to increase in the reactors, as seen in Figure 5, and perchlorate reduction performance became erratic. This upset was partially attributed to the high temperature caused by the high solids content and long solids retention time in the reactors. It was previously demonstrated that when reactor temperatures exceed 42°C (108°F), perchlorate reduction is severely inhibited. Operating the clarifier at 100% recycle created the very high solids retention time and overwhelmed the reactors with suspended and dissolved solids. The high recycle rate was acceptable for very dilute effluent/nutrient feeds but not for concentrated effluents. Therefore, the process was modified so that the recycle rate could be controlled to both reactors and to waste.

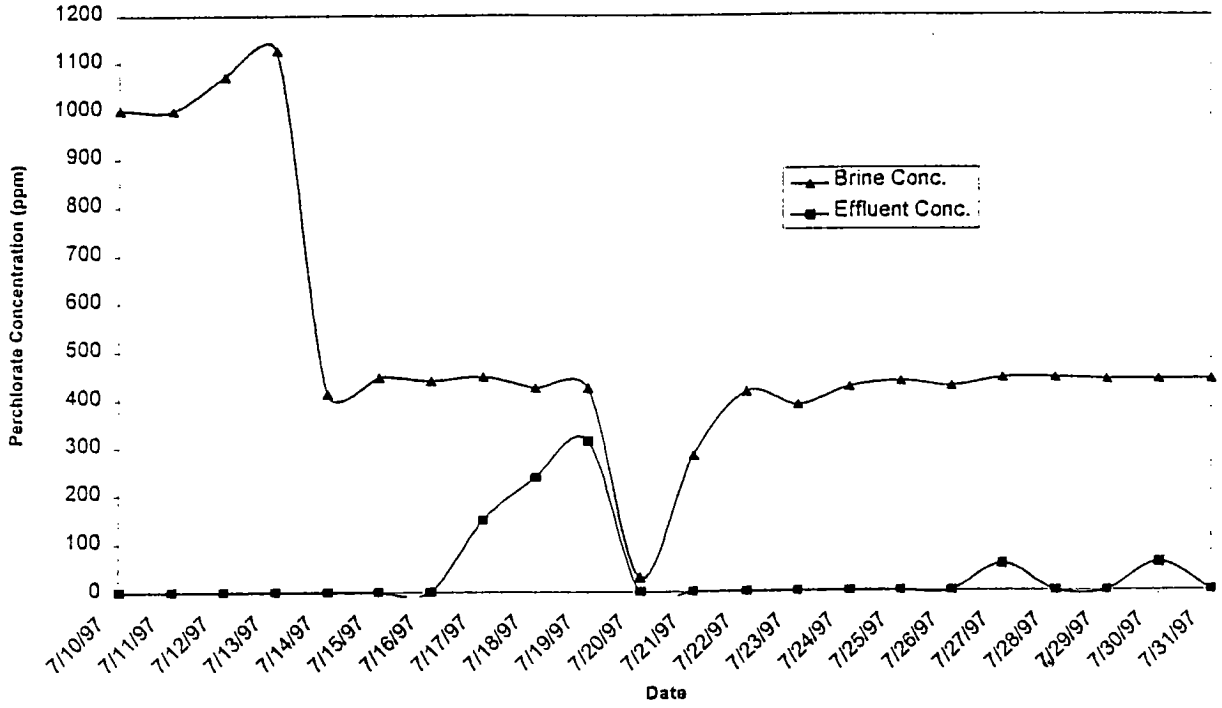


Figure 2. Perchlorate Concentration in R-1400 during Parallel Operation

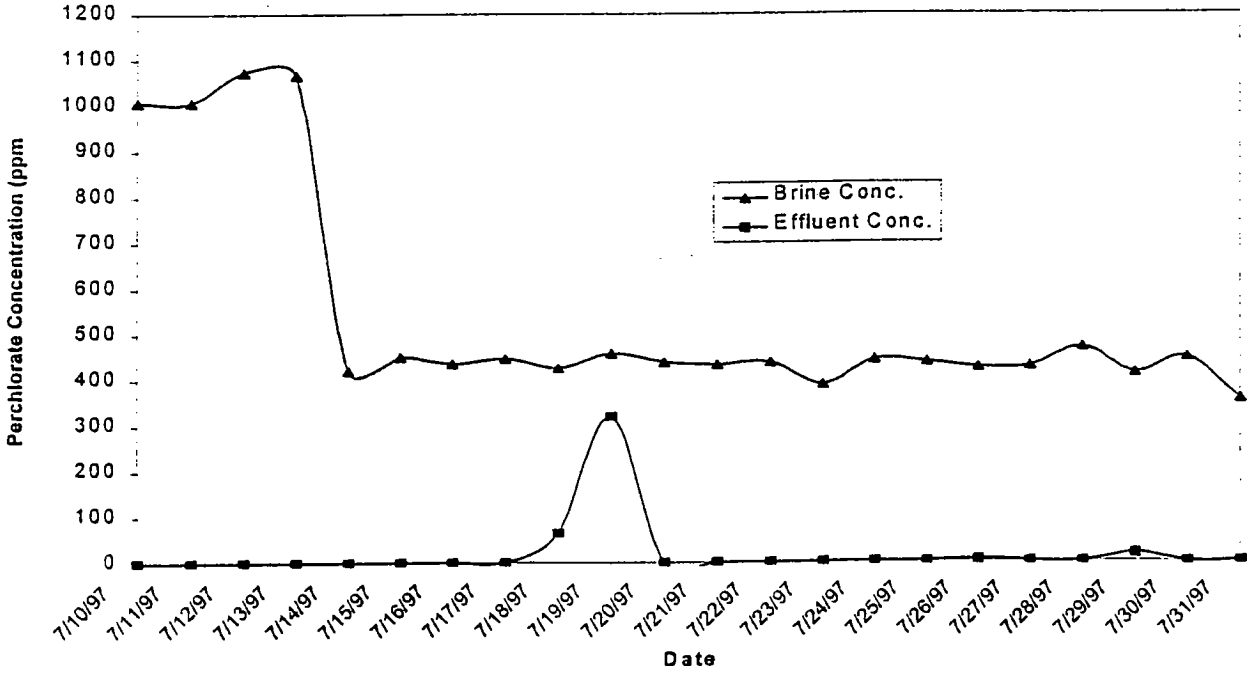


Figure 3. Perchlorate Concentration in R-1700 during Parallel Operation

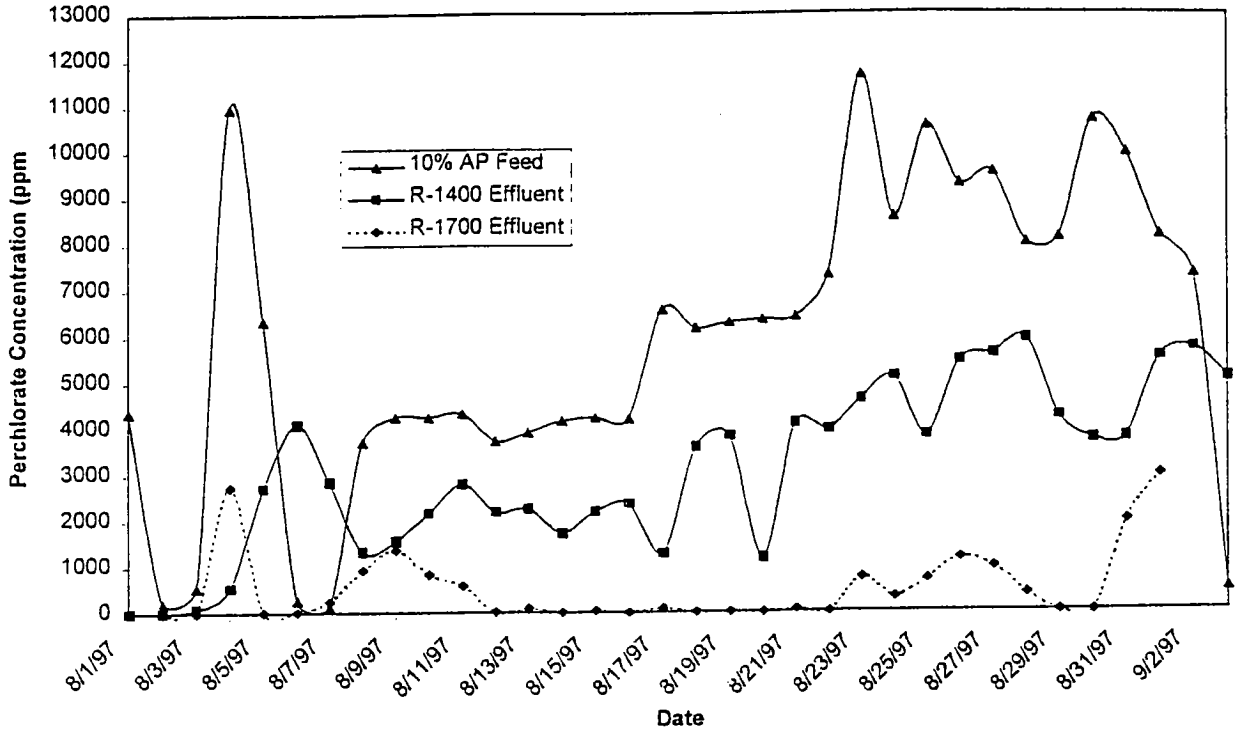


Figure 4. Perchlorate Concentration of the Feed and Reactors during Series Operation

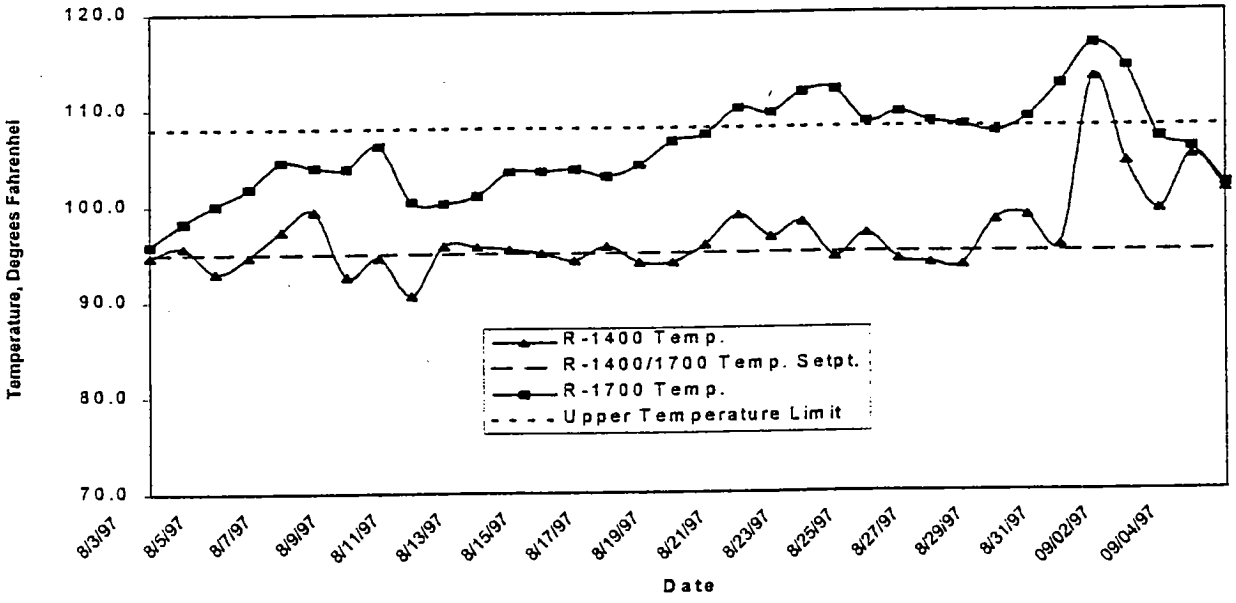


Figure 5. Reactor Temperatures during Series Operation

Prototype Demonstration at Thiokol

Minor process modifications were made during the system installation at Thiokol that began on 13 October 1997. Additional modifications and functional performance tests were conducted in November. On 8 December 1997, the reactors were inoculated using a culture that had been grown from a lyophilized sample. The typical effluent being treated at Thiokol comes from their ion exchange concentration and potassium precipitation units. Therefore, it is very high in TDS (150-300 g/l) and relatively low in perchlorate (~5000 mg/l). However, during the first two months of operation, the perchlorate in the brine effluent was relatively high (20-90,000 mg/l). In addition, the effluent contained approximately 10,000-mg/l nitrite and 5000-mg/l nitrate. The effluent is produced in batch processes; therefore, a different batch was fed to the reactors every 2-8 days. Because of the high TDS, the effluent is diluted to 5-10% of its original concentration as it is fed to the reactor. Figure 6 shows the actual perchlorate concentration in the undiluted feed and in the reactor effluent.

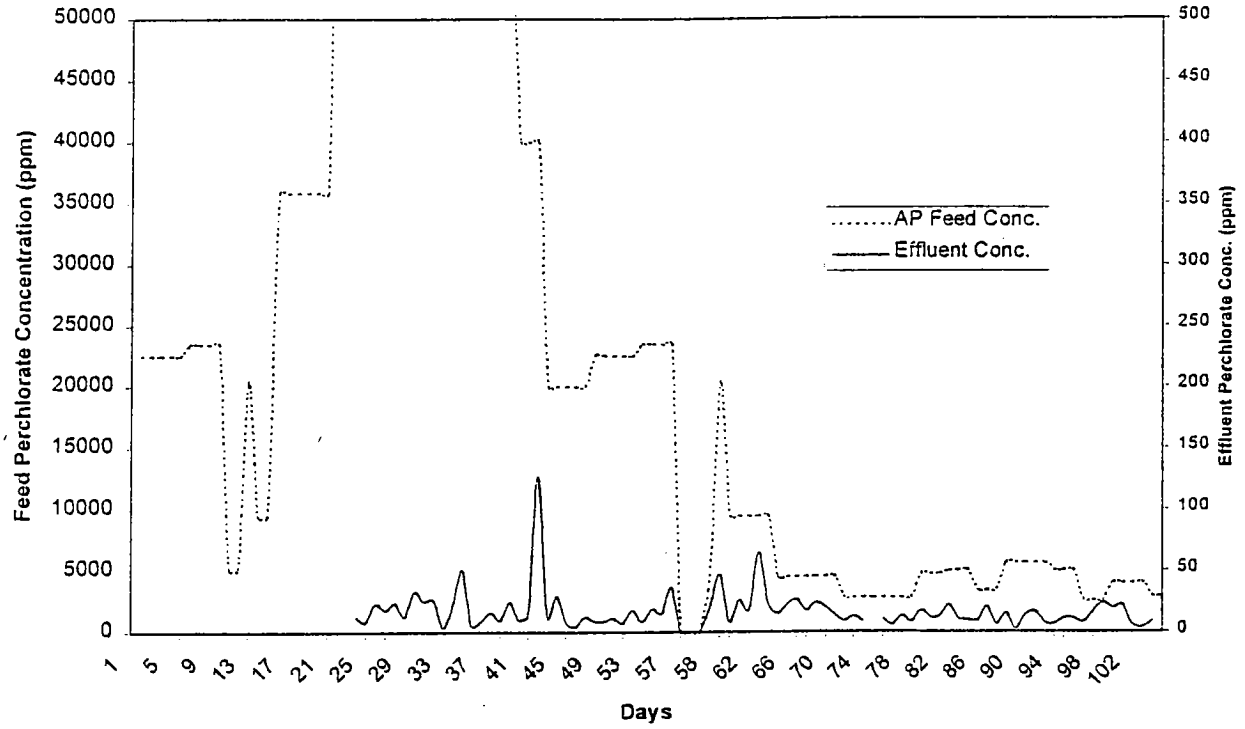


Figure 6. Perchlorate Concentration of Thiokol Brine and Reactor Effluent

During the first four months of operation at Thiokol, the prototype has performed very well. Some process control and software problems prevented optimal performance, nevertheless, perchlorate reduction has been acceptable. Typical perchlorate concentration in the reactor is less than 20 ppm by the ion-specific probe method. These results almost always translate to near non-detect by ion chromatography. The nitrate was also nearly completely reduced, however, little nitrite reduction was observed. During this four month period there has not been a major upset in operation and the re-inoculation has not been necessary.

PERCHLORATE REDUCTION IN WATER FROM THE MUDDY CREEK AQUIFER

The discovery of perchlorate in the Colorado River led to the identification of a source area near Henderson, Nevada. Ammonium perchlorate has been manufactured in this area since the 1950s. Perchlorate in the soil and groundwater has contaminated shallow aquifers that feed the Las Vegas Wash, which flows into Lake Mead and the Colorado River. Water from one test well in this aquifer had a perchlorate concentration of 3700-ppm, which is over 200,000 times the 18-ppb action level established by the California Department of Health Services (DHS). Lake Mead supplies drinking water to over 12 million people in southern Nevada and California. Perchlorate concentration in Lake Mead, and in the drinking water from Lake Mead, has been measured near the 18-ppb action level established by the California DHS. Therefore, this is an acute problem and potential excellent application for perchlorate biodegradation.

Currently, some of the water in this aquifer is being pumped to the surface and treated to reduce chrome (VI). This water, which contains perchlorate and other contaminants, is then injected back into the aquifer. Biodegradation of the perchlorate in this water before it is re-injected could mitigate this acute problem. The nominal composition of water from the aquifer is provided in Table 2.

Table 2. Nominal Composition of Water from the Muddy Creek Aquifer

Component	Concentration, mg/l	Component	Concentration, mg/l
Perchlorate, ClO_4-	1200-1500	Calcium, Ca^{+2}	800
Chlorate, ClO_3-	3000-3500	Magnesium, Mg^{+2}	400
Sulfate, SO_4-	1700	Nitrate, NO_3-	200
Chloride, Cl-	2000	Boron	14
Sodium, Na^+	1800	Chrome (VI)	9

Treatability studies were conducted on this water in laboratory-scale CSTRs. Since the total dissolved solids of this water was less than 2% (~120 g/l), the water was mixed with nutrient and fed directly to the reactors. However, water from this aquifer contained high concentrations of contaminants that had not been previously evaluated in this perchlorate biodegradation process. Two contaminants of particular concern were chlorate (ClO_3-) and chrome (VI). Studies were designed to determine if contaminants would compete with, or inhibit, perchlorate reduction. Specific objectives were to:

- Determine if perchlorate is biological reduced in this ground water matrix
- Determine the fate of the chrome (VI)
- Determine the impact of chlorate (ClO_3-) on perchlorate reduction
- Determine the effect of indigenous microbes on perchlorate reduction

The results of over 7000 hours of testing were very positive. Long-term studies were conducted in different reactor configurations using both typical and alternate nutrients to minimize nutrient consumption and cost. Both chlorate and perchlorate were effectively reduced to chloride. Typically all the chlorate was reduced before perchlorate could be completely reduced. However, chlorate reduction consumed little additional nutrient. Perchlorate was completely reduced with 0.05 pounds of nutrient per gallon of effluent. This translated into $0.015 per gallon for the nutrient mixtures evaluated. Preliminary tests using milk and brewery process wastes were also very promising and could further reduce the nutrient cost to less than a cent per gallon.

Chrome did not inhibit perchlorate reduction and was reduced to chrome (III) in the process. Chrome (VI) was reduced from 8-9 ppm to less than 0.2 ppm. Nitrate was also simultaneously reduced. One test was specifically designed to evaluate the effect of the indigenous microbes that were present. Screening tests on these microbes showed they could not reduce perchlorate. A reactor was operated for over two months with a "neat" feed stream of un-sterilized ground water containing these microbes. Perchlorate reduction performance did not deteriorate during this period.

REDUCTION OF PERCHLORATE IN HYDROLYSATE

An effective and accepted way to destroy the energetic character of propellant and pyrotechnic ingredients in water is through base hydrolysis. Significant research has been conducted in this area and several demonstrations and operational processes currently exist. Some propellants, explosives and pyrotechnics (PEP) contain perchlorate. If perchlorate can be reduced in hydrolysates of PEPs and other hydrolyzed process waste streams, then more cost-effective waste disposal options are possible. To test the feasibility of this concept, a surrogate of RDX hydrolysate containing perchlorate was evaluated. The surrogate was based on experimentally determined complete hydrolysis products of RDX[4]. The composition of the actual feed material prepared for this test is provided in Table 3. The amount of RDX required for this formulation equated to 2.22 grams per liter. Theoretically, the concentration of this surrogate could be increased several fold. During these tests perchlorate was completely reduced. In addition, some of the hydrolysis products, particularly formate, were consumed as nutrients.

Table 3. Composition of Surrogate RDX Hydrolysis Containing Perchlorate

Component	Concentration, mg/l	Component	Concentration, mg/l
Perchlorate, ClO_4-	~1000	Formaldehyde, CH_2O	330
Formate, CHO_2-	675	Nitrite, NO_2-	236
Acetate, CH_3O_2-	220	TDS	~3200

REDUCTION OF CHLORATE IN DYE COLORED SMOKES

Dye colored smoke formulations typically contain fuel, oxidizer, and dye components. Chlorate (ClO_3-) salts are the oxidizers and dextrose or similar materials make up the fuel and binder components. Biodegradation of the water-soluble components of smoke formulation could greatly improve disposal options. For instance, hydrothermal oxidation (HTO) has been considered for smoke disposal. A major technical hurdle of this technology has been salt and acid-handling problems caused by the high chlorate concentrations. The treatability studies conducted on water from the Muddy Creek Aquifer demonstrated that chlorate can be effectively degraded by the same process that degrades perchlorate. In addition, water-soluble fuel components may provide the nutrient required to drive the biodegradation process. Destruction of chlorate and other water-soluble components in this manner would greatly simplify the hydrothermal destruction of the dye components, increase process rates, improve reliability, and potentially reduce cost.

CONCLUSION

The process described in this paper is a proven, low-cost approach to addressing the many perchlorate treatment needs brought about by more stringent and widespread environmental regulation. Disposal of ammonium perchlorate from production, remanufacturing, test and evaluation, and remediation activities is an industry-wide, national problem. The demonstrated ability to effectively biodegrade dilute ammonium perchlorate wastes enables continued use of this critical defense material in both rocket motors and ordnance items. In addition, it has been demonstrated that nitrate, nitrite, chlorate, and chrome VI can be reduced with, or without, perchlorates present. Highly contaminated ground water has been effectively treated to reduce mixtures of the above contaminants to acceptable discharge levels. The use of low-cost, alternate nutrients, and even process waste materials, has reduced nutrient cost to near a cent per gallon or less and makes this a very cost-effective process to implement and operate. The ability to destroy perchlorate to non-detect levels in complex waste streams is a distinct advantage over selective concentration and catalytic destruction processes that can become fouled or overwhelmed by co-contaminants. Over eight years of research and development has resulted in a mature process that can be applied to many environmental problems related to perchlorate, nitrate, and mixed energetic wastes.

REFERENCES

1. Attaway, H., and Smith, M. 1993. "Reduction of Perchlorate by an Anaerobic Enrichment Culture." Journal of Industrial Microbiology. 12: 408-412

2. Wallace, W., Ward, T., Breen, A., Attaway, H. 1996. "Identification of an Anaerobic Bacterium Which Reduces Perchlorate and Chlorate as *Wolinella succinogenes*." Journal of Industrial Microbiology. 16: 68-72

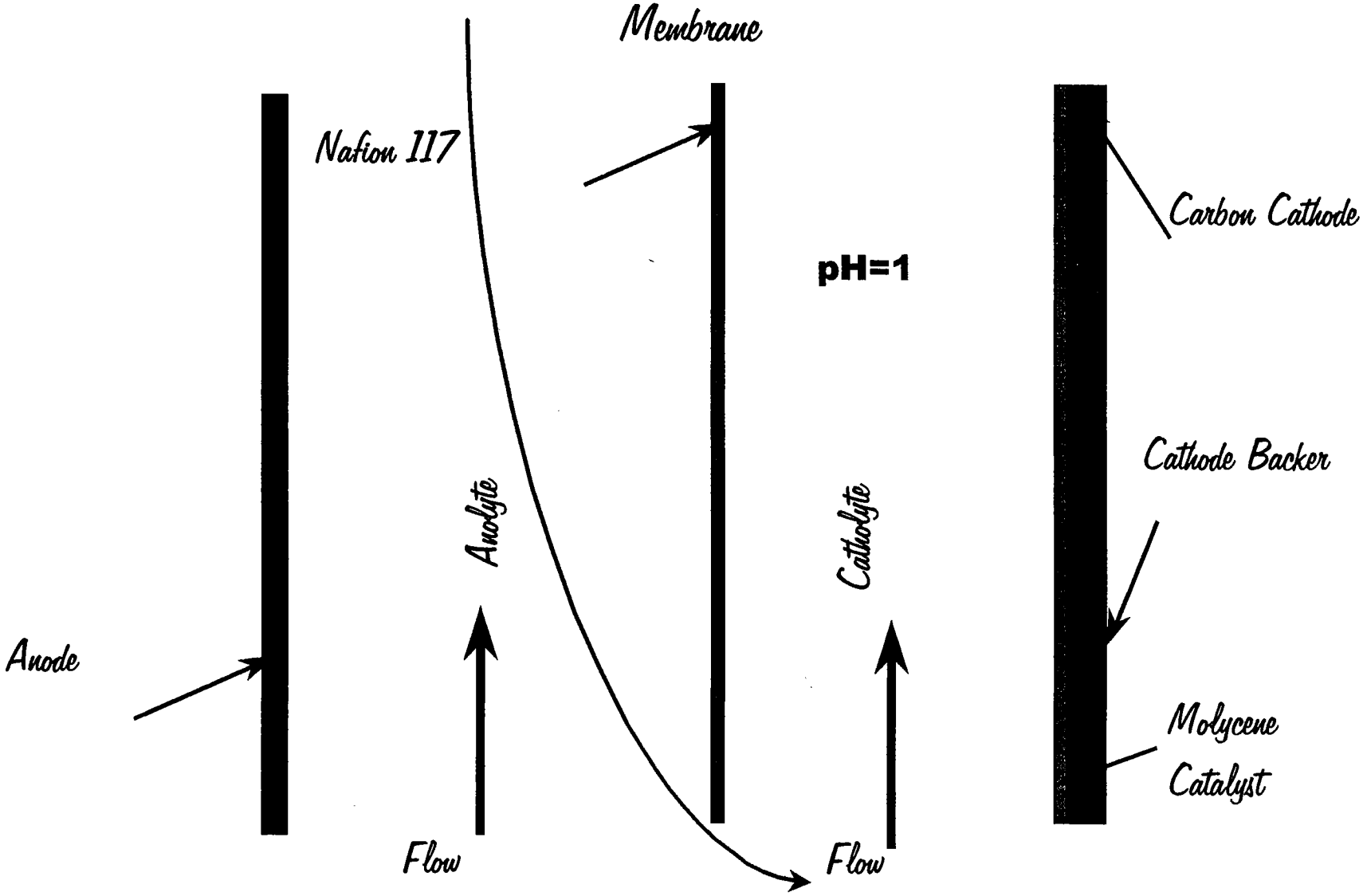
3. United States Patent 5,302,285. "Propellant Wastewater Treatment Process." April 12, 1994

4. Heilmann, H., Wisemann, U., Stenstrom, M., 1996. "Kinetics of Alkaline Hydrolysis of High Explosives RDX and HMX in Aqueous Solution and Adsorbed to Activated Carbon." Environmental Science & Technology. 30: 1485-1492

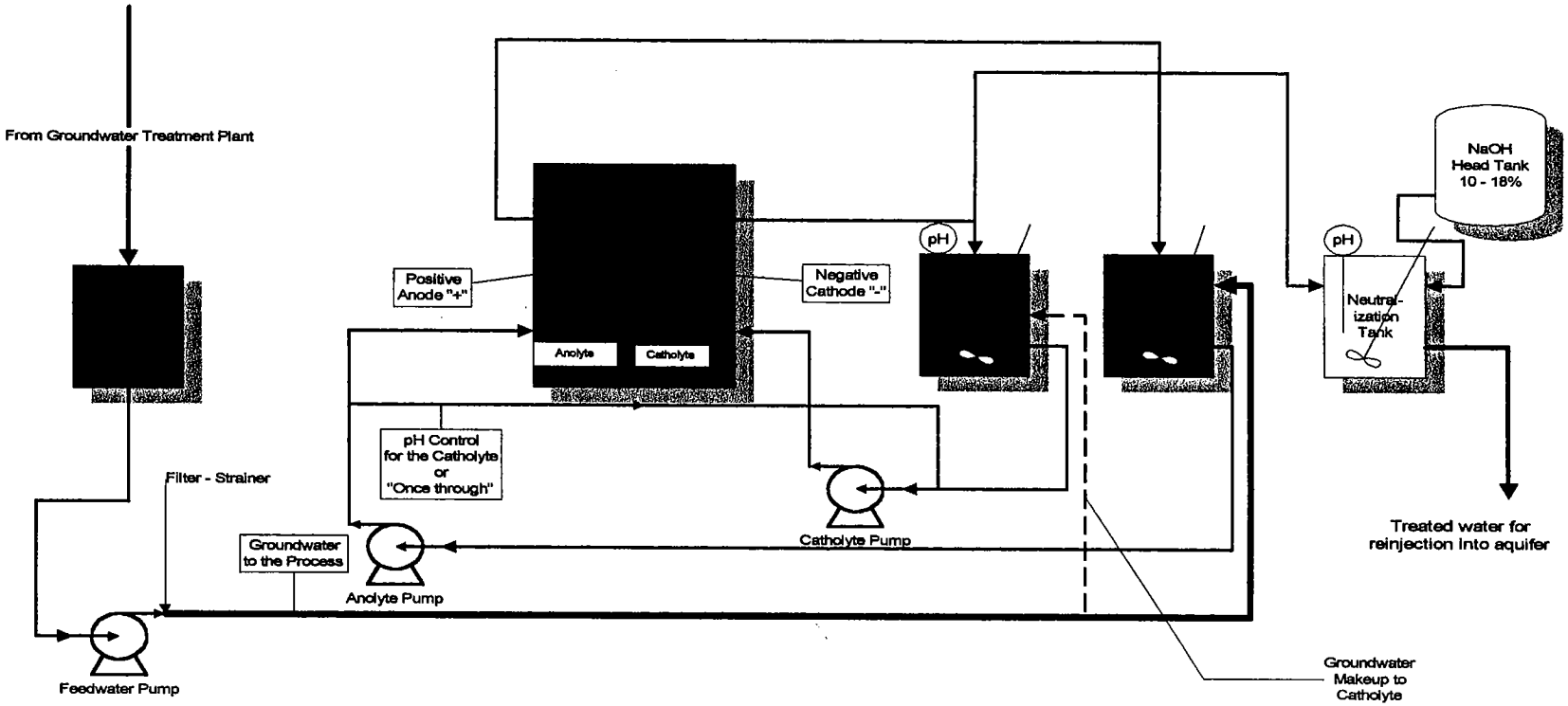
Appendix VI

Electrochemical Flow Sheets

Electrochemical Reduction Electrocatalyst Cell



Electrochemical Reduction Conceptual Plant Flowsheet



Basic Flowsheet for "Electrolytic Cell for Reduction for Perchlorate from Groundwater"
Flowsheet Number HEN-03

EMSpore
Jan 11, 1998
Kerr-McGee Chemical LLC
Henderson, NV

Appendix VII

Electrochemical Data

Kerr-McGee Chemical Corporation
Research & Development
P.O. Box 25861
Oklahoma City, OK 73125

April 20, 1998

David K. Gage
ICET, Inc.
916 Pleasant St., #12
Norwood, MA 02062
(781) 769-6064

Received on: April 15, 1998

The six samples received on the above date have been analyzed, as requested, for perchlorate (ClO4), chlorate (ClO3), chloride (Cl), nitrite (NO2), and nitrate (NO3), Table I.

Sample 055-125F was <0.01 g/l and was re-analyzed by IC.

Table I
Liquid Samples
Job: AC009260

Sample ID	ClO4 by ISE (g/l)	ClO4 by IC (mg/l)	ClO3 by IC (mg/l)	Cl by IC (mg/l)	NO2 by IC (mg/l)	NO3 by IC (mg/l)
ICET-055-125A	1.0		<1	8	<1	220
ICET-055-125B	0.55		<1	110	<1	4
ICET-055-125C	1.2		2350	64	<1	90
ICET-055-125D	0.86		<1	3020	<1	8
ICET-055-125E	0.011		150	24	<1	12
ICET-055-125F	<0.01	2.4	<1	3480	<1	2

Sincerely,

Angie M. Thrower

cc: D. A. Ward
E. M. Spore (e-mail)

File: Chron
JOB: AC009235

TM-980132

Kerr-McGee Chemical LLC

Report of Analysis

To: E. M. Spore ***Date:*** May 21, 1998

Date Received: April 30, 1998 ***Project No.:*** PE 362

Subject: Henderson: Groundwater (ICET) ***Page No.:*** 1 of 1

The samples received on the above date have been analyzed for the requested parameters, Table I.

Table I
Groundwater – (ICET)
JOB: AC009329

Sample ID	g/l ClO_4	mg/l ClO_3	mg/l Cl	mg/l NO_2	mg/l NO_3
ICET055-134D	1.2	3490	230	<1	270
ICET055-134E	0.011	<1	2700	<1	<1
ICET055-134F	1.1	7700	170	<1	370
ICET055-134G	0.007	<1	3300	<1	<1

(1200ppm) 1,200,000ppb
(11ppm) 11,000ppb
(1100ppm) 1,100,000ppb
(7ppm) 7000 ppb

Marian T. Miller

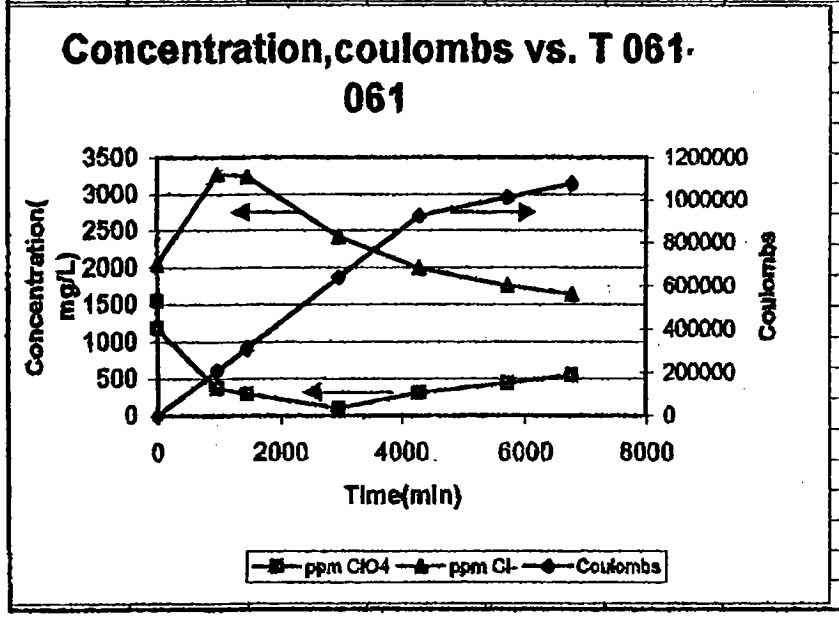
Distribution:

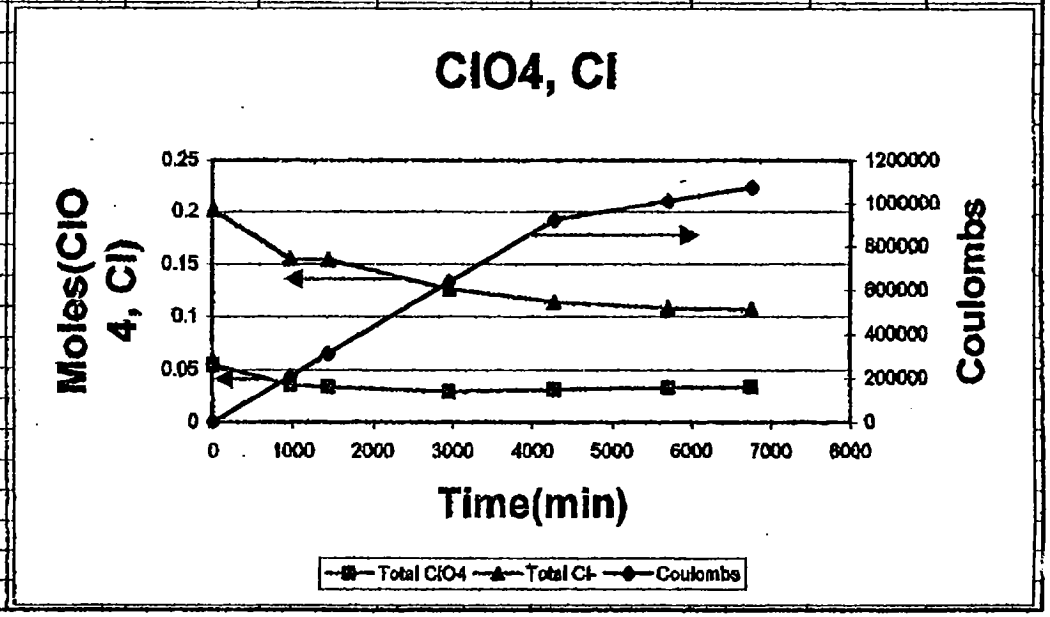
D. A. Ward _____ _____
VALIDATED – *Project Leader* *Date*

B. R. Clark _____ _____
APPROVED – *Manager* *Date*

PE 362
CHEM 3
AC-98032
JOB: AC009329

time(min)	Coulombs	I(A)	CV(V)	Cathode ppm ClO4	Cathode ppm Cl-	Anode ppm ClO4	Anode ppm Cl-	Cathode Volume(l)	Anode Volume(l)	Moles in ClO4 Sample	Moles in Cl Sample	Total ClO4 Moles	Total Cl- Moles	
0	0	0	0	1543	2044	1543	2044	1.5	2	0.000155149	0.000576538	0.054302	0.201788	
0.1	0	3.6	1.4	1182	2052	---	---	1.49	1.99	0.00011885	0.000578794	0.054457	0.202365	
970	209520	3.6	2.37	371	3266	1495	229	1.5287145	1.946267	0.000187626	0.000985812	0.035233	0.154555	*
1445	312120	3.6	2.36	294	3238	1460	199	1.5476727	1.924851	0.000176365	0.000969453	0.033294	0.154298	*
2955	638280	3.6	—	98	2409	1434.455	266.5526	1.6079397	1.856772	9.8539E-06	0.000679491	0.029003	0.126329	*
4275	923400	1	1.831	306	1992	1412.124	325.6053	1.6606234	1.797259	0.000307683	0.000561871	0.031276	0.113602	*
5715	1012140	1	1.774	444	1748	1387.763	390.0263	1.7180965	1.732335	4.46442E-05	0.000493047	0.032799	0.10812	*
6765	1075140	1	1.876	544	1633	1370	437	1.76	1.695	0.000192453	0.000583872	0.033839	0.106682	





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

October 23, 1997

MEMORANDUM

To: Bob Kelso
From: Valerie King VK

Re: Kerr-McGee request to increase volume/rate of injection into UIC-permitted trenches

The draft letter from WPC to Kerr-McGee regarding their request to increase the injection rate was sent to you today via internal mail. Jim, Cathe, and I would like to schedule a meeting with you at your earliest convenience prior to sending this letter to Kerr-McGee. At this time we can discuss the various perspectives related to this facility and ensure that both bureaus are coordinated in their efforts.

Thanks, Bob.

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

October 24, 1997

Patrick S. Corbett
Plant Manager
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, NV 89009

RE: **Temporary Permit Modification for Permit #UNEV94218, Kerr-McGee Chemical Corporation**

Dear Mr. Corbett:

The Division of Environmental Protection has received and reviewed the correspondence dated October 13, 1997, requesting to increase the volume and rate of injection into the permitted Kerr-McGee trench(es). To make a complete assessment regarding this request, please submit the following additional information:

- Specify the intent of determining the injection trench(es) capacity via increasing the injectate rate/volume. Is an alternative treatment being considered? If so, please specify what the treatment entails and what the injection goal is for the success of the treatment.
- Demonstrate how the proposed injection will affect the existing groundwater contamination.
- Specify the trench(es) that will be injected into and at what fraction of the total volume if injecting into both.
- Specify the manner in which the injectate will be introduced (pressure or gravity flow).
- Specify the time-frame of the injection test.
- Identify the wells that will be monitored for the determination of injection capacity.

- Provide analytical water quality results for the make-up water to verify that it is "clean".
- Specify the location that the make-up water will be introduced into the system (before or after the treatment system).
- Provide a concentration contour map for both hexavalent chromium and ammonium perchlorate

Thank you for your attention to this matter. If you have any questions or would like to discuss this further, please call me at (702)687-4670 extension 3146.

Sincerely,

Valerie G. King
Environmental Scientist
Bureau of Water Pollution Control

cc: Cathe Pool
Doug Zimmerman
Bob Kelso
Mark Porterfield
Susan Crowley

ionics

RCC Resources Conservation Company

3006 Northup Way
Bellevue, WA 98004-1407
U.S.A.

Tel: 425 828-2400
Fax: 425 828-0526

A Division of Ionics, Incorporated

October 23, 1997

Kerr-McGee Chemical Corporation
Post Office Box 55
Henderson, NV 89015

Attention: Mr. Everette Spore

Subject: Henderson Groundwater Treatment Plant Effluent
Glassware Evaporation Testing - RCC Proposal No. 97-2692

Gentlemen:

Following is a discussion of the procedures and results associated with the subject testing.

SUMMARY

Ionics RCC has successfully concentrated the Kerr-McGee Groundwater Treatment Plant Discharge (GTPD) to a Concentration Factor (CF) of 25 as specified in the test plan. No fouling, scaling, or foaming was observed, and the final brine had a boiling point rise of 5.6°F. The CF 25 brine at pH 7.3 contained 65,600 mg/L Total Suspended Solids and 236,000 mg/L Total Dissolved Solids. Periodic additions of sodium hydroxide were necessary to maintain the sump pH above 6.5. Overall results indicate that chlorate and perchlorate remain dissolved in the final brine.

Distillate quality was fairly uniform throughout (characterized via grab samples) exhibiting conductivities in the range 100-160 µmhos/cm and pH between 6.8 and 8.4. Both pH and conductivities were higher following caustic additions to the concentrate. Noncondensable gases were not detected. Corrosion testing of selected metal coupons in the final brine is currently underway.

One liter of CF 25 concentrate and two liters of CF 20-25 distillate were sent to Kerr-McGee for evaluation on October 21, 1997.

RESULTS AND DISCUSSION

Feed Water Analysis

The GTP Discharge was processed "as-received" without any further pretreatment. This colorless, odorless water had a TDS of 12,000 mg/L with a pH of 7.4. While the suspended solids were very low and analytically undetected, the filtration left a light brown residue. The overall chemistry was similar to that reported by Kerr-McGee as suggested by TDS and the major ions. Although RCC is unable to analyze for chlorate and perchlorate which make up a significant portion of the total anions, the inclusion of the reported levels give acceptable mass- and ion-balances. Results are reported in the attachment.

Glassware Evaporation Testing

The bench-scale testing utilized a three-necked boiling flask equipped with a cold water condenser as described in the test plan. Heating was provided by electrical means using a heating jacket. Enough heat was applied to maintain the contents at a brisk boil. The concentrate was mixed well throughout using a magnetic mixer and a stir bar. The vapor was cooled in the condenser, and the resulting distillate was collected and combined into five fractions corresponding to five CF intervals. A constant concentrate volume was maintained by a metering pump which regulated the feed addition on a demand basis.

Concentrate boiling point and pH as well as distillate pH and conductivity was monitored intermittently. Turbidity was observed in the concentrate at CF 1.9, which corresponded to the precipitation of Calcium Sulfate and was expected based on calculations. The concentrate pH continued to decrease in the course of evaporation and reached 6.6 at CF 14. At this time, a small dose of caustic was added to prevent the pH from falling further. The caustic use during this test equated to 0.70 lb per 1000 gallons of feed (100% caustic basis).

A total of about 25.4 liters of feed were consumed which produced 24 liters of distillate and one liter of concentrate at CF 25. A mass-balance by weight showed that 99% of the original material was recovered as products. No fouling, scaling, or foaming were encountered at any point, and the CF 25 brine had a boiling point rise of 5.6°F.

Concentrate

A small sample of the final concentrate was filtered near its boiling point to determine TSS, TDS, and a limited number of analytes. The remainder was allowed to cool. The results, 65,600 mg/L TSS and 236,000 mg/L TDS, showed good accountability compared to the theoretical solids inventory (301,000 mg/L Total Solids). As expected, the solids portion revealed substantial amounts of $CaSO_4$. Based on corrections for occluded brine entrapped in the solids, the calcium sulfate accounts for roughly 84% of the dry solids. Small amounts of magnesium and silica also precipitated.

Prominent ions in the final brine were sodium (44,000 mg/L) and chloride (49,300 mg/L), and both remained dissolved throughout the evaporation. As expected, the sodium levels were slightly higher than calculated from the feed alone due to the contribution from added NaOH. Based on distillate data (below), an acceptable chloride balance, and an overall ion-balance on the brine, both chlorate and perchlorate are assumed to remain intact in the brine. Dissolved concentrations of 80,000 mg/L ClO_3^- and 38,000 mg/L ClO_4^- are therefore expected in the CF 25 brine.

Distillate

Distillate samples were collected every five CF. All samples were colorless and odorless. pH and conductivity of the five distillate samples collected are tabulated below. It was observed that caustic additions to the concentrate in all cases increased both pH and conductivity temporarily.

Distillate	CF	pH	Conductivity μmhos/cm
1	1-5	7.3	145
2	5-10	7.3	105
3	10-15	7.6	123
4	15-20	7.7	146
5	20-25	7.5	114

Investigation of selected analytes in the final distillate revealed mainly ammonia and inorganic carbon, with small amounts of chloride. These analytes are also present in the feed. The combination of NH_4^+ and HCO_3^- in distillate samples and has been observed in previous glassware evaporation tests on other wastewaters containing these analytes. This weak ion pair, ammonium bicarbonate, decomposes at 60°C at a neutral pH to give NH_3, CO_2, and H_2O, all of which are observed to carry over into the distillate. The weak ion pair is then re-established, probably on condensation, to account for the fairly high distillate conductivities. A conductivity of 114 μmhos/cm in the final distillate suggests 78 mg/L NH_4HCO_3 based on a correlation of concentration and conductivity. This agrees well with the observed concentration, 73 mg/L, based on analytical results for inorganic carbon and ammonia nitrogen.

A test for noncondensable gases was administered on two occasions during the evaporation test. This procedure simply quantified air displacement/gas generation from the evaporator vent over time by collection in a water-filled and inverted cylinder. (A schematic was given in the test plan.) In each of the two tests, the rate of displacement of water was identical (within experimental uncertainty) to the distillate rate; therefore, no noncondensable gases were detected.

Conclusions

1. The GTPD water can be concentrated at least 25 times in a seeded slurry Brine Concentrator unit.
2. Caustic use is minimal and may not even be required. (Its addition in this test was to ensure the concentrate pH did not go to levels below about 6.0.)
3. The distillate is of good quality with small levels of ammonium bicarbonate.

I trust the samples of concentrate and distillate sent to you earlier, arrived without any inconvenience. RCC would appreciate receiving any results you generate from your work using those materials. I will update you on the corrosion tests as results become available.

Kerr-McGee.

Glassware Evaporation Testing on Groundwater Treatment Plant Discharge

ANALYTE	Feed	Conc Filtrate CF 25	Conc Solids CF 25	Dist 5 CF 20-25
	mg/L	mg/L	mg/kg	mg/L
Total Dissolved Solids (105C)	12,000	236,000		
Total Dissolved Solids (180C)				
Total Suspended Solids (105C)	< 10	65,600		
Boiling Point Rise, deg F		5.6		
Density (deg C), g/mL	1.006			
pH, standard units	7.4	7.3		7.5
Conductivity, umhos/cm	12,200			114
Sodium	1,700	44,000	18,000	
Calcium	690	960	223,000	
Magnesium	380	8,700	16,000	
Potassium	34	< 4,000		
Silica	50	< 1,000	18,000	
Ammonium Nitrogen	15	9		13
Nitrate Nitrogen	52			
Nitrite Nitrogen	2.2			
Fluoride	1.3			
Chloride	2,000	49,300		1.4
Total Phosphorus	< 0.6	< 1,000		
Total Sulfur	600	1,700	187,000	
Total Inorganic Carbon	26			11
t-Alkalinity, as CaCO3	100			
Total Organic Carbon	< 20			

NOTES:
The concentrate filtrate and solids were isolated from the hot slurry by filtration at or near its boiling point.
The solids have not been corrected for occluded brine.

If you have any questions or require any additional explanation, please let me know. In the meantime, I will assume this transmittal concludes this phase of our work on this aspect of the project. As we discussed RCC is retaining the unused quantity of GTPD water until further notice.

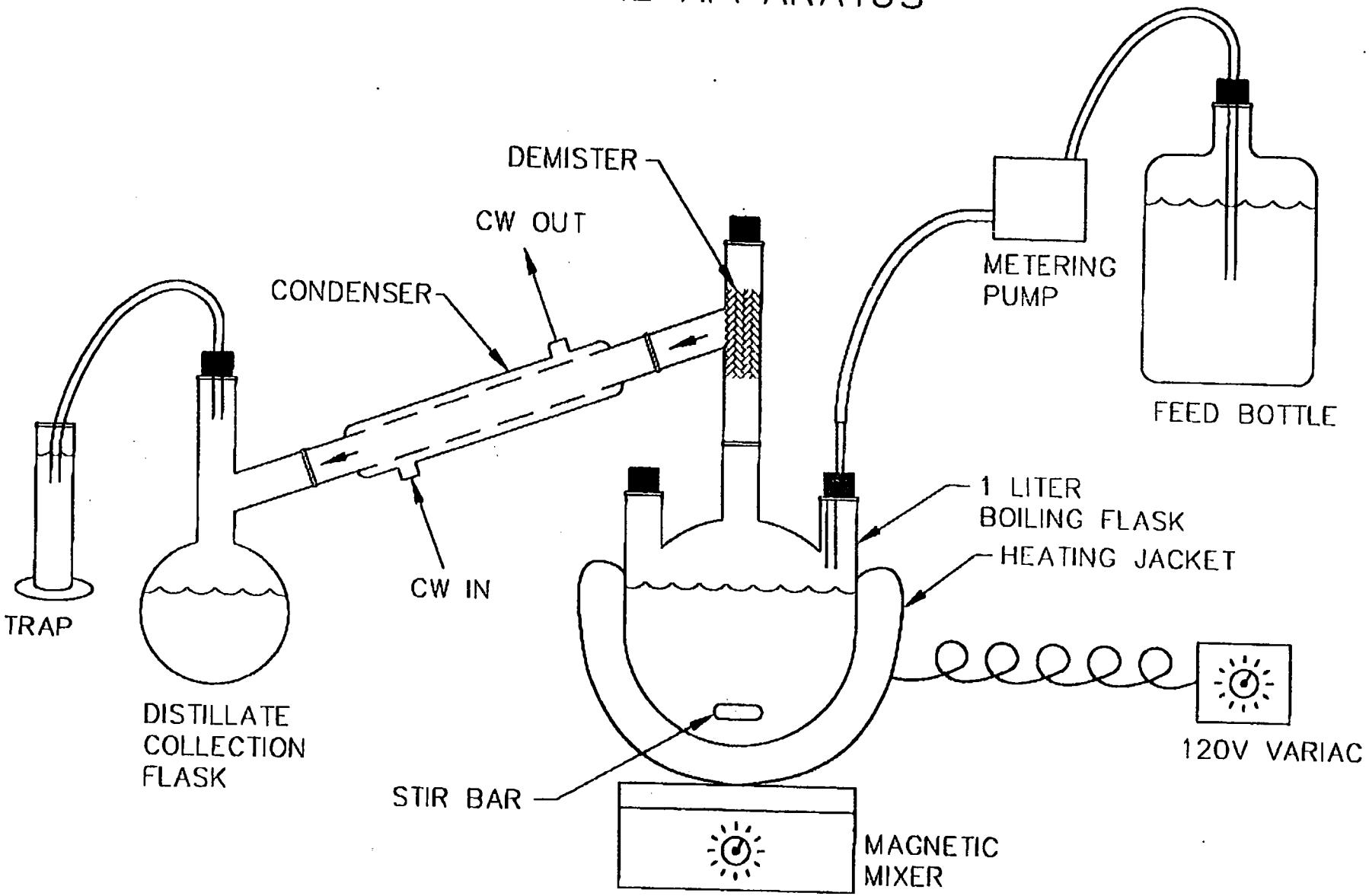
Very truly yours,
RESOURCES CONSERVATION COMPANY

Terry M. O'Neail
Manager, Process System Design

TMO/cvw

Attachment - Test Plan for Kerr McGee Glassware Evaporation Testing

GLASSWARE APPARATUS



Appendix II

Groundwater Analysis

Table I
Henderson Groundwater Treatment Plant
Analysis of Feed and Discharge Water
Results: mg/l

Parameters	Samples			
	Feed		Discharge	
	Total	Soluble	Total	Soluble
pH	7.42	—	7.54	—
HCO_3	480	410	390	350 ✓
Cl	2100[1]	2000[3]	2100[1]	2100[3] ✓
SO_4	1700[2]	1700[3]	1700[2]	1700[3] ✓
ClO_3	3500[1]	3400[3]	3400[1]	3200[3] ✓
ClO_4	1590[4]	1520[4]	1560[4]	1520[4] ✓
ICAP Scan:				
Al	0.16	0.14	0.14	0.13
B	13.4	14.4	13.9	13.2
Ba	0.03	0.03	0.02	0.02
Ca	800	770	797	736 ✓
Co	0.01	0.01	0.01	0.01
Cr	8.88	8.88	0.06	0.009
Cu	0.009	0.006	0.007	0.006
Fe	6.19	0.007	0.40	0.008
K	33.6	37.3	39.4	36.5 ✓
Mg	426	434	445	419 ✓
Mo	0.03	0.07	0.09	0.07
Na	1800	1760	1950	1830 ✓
Ni	0.02	0.02	0.02	0.02
Sr	0.70	0.79	0.75	0.57 ✓
Sn	0.15	0.03	0.02	<0.01
Ti	0.01	0.001	0.006	<0.001
V	0.38	0.006	<0.005	<0.005
Zn	0.12	0.02	0.05	0.06
TDS	12,240	12,020	12,690	12,120
TSS	28.2	—	12.2	—
Specific Conductance (mS/cm)	16.72	16.70	18.79	14.50

1. Titration
2. Gravimetric
3. Ion Chromatography
4. Ion Selective Electrode

Appendix III

Reverse Osmosis

TM-970345

KERR-McGEE CHEMICAL CORPORATION
ANALYTICAL CHEMISTRY SECTION

REPORT OF ANALYSIS

Received From:	E. M. Spore	***Date of Report:***	October 6, 1997
On Date:	September 26, 1997	***Project Number:***	PE 362
Identification:	Henderson: Groundwater Samples for Perchlorate Analysis (Osmonics)	***Page:***	1 of 2

The two sets of groundwater samples submitted by Osmonics have been analyzed for perchlorate content by ISE, Table I.

These results were reported to Osmonics by telephone.

Validated - Project Leader

D. A. Ward _____ 10/6/97
***VALIDATED** -Project Leader*

B. R. Clark _____ 10-6-97
APPROVED-Manager

Distribution:

File: Chron
P/C PE 362
CHEM 4
AC-97046
JOB: AC008384

Table I
Henderson Groundwater
Treatments by Osmonics
Results: mg/l

Sample Ids	ISE Results
Composite - Permeate	450
50% Recovery	410
75% Recovery	930
90% Recovery	1400
Concentrate at 90% Recovery	3800
2nd Pass Composite Permeate - and Anion Resin (-OH) Treatment	1.2
2nd Pass RO Composite Permeate - and KDF Media Treatment	130
2nd Pass ST10(HP)- Permeate at 75% Recovery	200
2nd Pass RO Composite Permeate - ozonated 5 minutes	130
Initial Feed from Discharge Sample - ozonated 10 minutes	1200
2nd Pass ST10(HP) Permeatge - at 50% Recovery	140
ST10(HP) 2nd Pass Concentrate - at 80% Recovery	910
ST10(HP) Composite Permeate	130

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

October 23, 1997

DRAFT

Patrick S. Corbett
Plant Manager
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, NV 89009

RE: **Temporary Permit Modification for Permit #UNEV94218, Kerr-McGee Chemical Corporation**

Dear Mr. Corbett:

The Division of Environmental Protection has received and reviewed the correspondence dated October 13, 1997, requesting to increase the volume and rate of injection into the permitted Kerr-McGee trench(es). To make a complete assessment regarding this request, please submit the following additional information:

- Specify the intent of determining the injection trench(es) capacity via increasing the injectate rate/volume. Is an alternative treatment being considered? If so, please specify what the treatment entails and what the injection goal is for the success of the treatment.
- Demonstrate how the proposed injection will affect the existing groundwater contamination.
- Specify the trench(es) that will be injected into and at what fraction of the total volume if injecting into both.
- Specify the manner in which the injectate will be introduced (pressure or gravity flow).
- Specify the time-frame of the injection test.
- Identify the wells that will be monitored for the determination of injection capacity.

DRAFT

- Provide analytical water quality results for the make-up water to verify that it is "clean".
- Specify the location that the make-up water will be introduced into the system (before or after the treatment system).
- Provide a concentration contour map for both hexavalent chromium and ammonium perchlorate

Thank you for your attention to this matter. If you have any questions or would like to discuss this further, please call me at (702)687-4670 extension 3146.

Sincerely,

Valerie G. King
Environmental Scientist
Bureau of Water Pollution Control

cc: Cathe Pool
Doug Zimmerman
Bob Kelso
Mark Porterfield
Susan Crowley

DRAFT

- Provide analytical water quality results for the make-up water to verify that it is "clean".
- Specify the location that the make-up water will be introduced into the system (before or after the treatment system).
- Provide a concentration contour map for both hexavalent chromium and ammonium perchlorate

Thank you for your attention to this matter. If you have any questions or would like to discuss this further, please call me at (702)687-4670 extension 3146.

Sincerely,

Valerie G. King
Environmental Scientist
Bureau of Water Pollution Control

cc: Cathe Pool
Doug Zimmerman
Bob Kelso
Mark Porterfield
Susan Crowley

PETER G. MORROS, Director

L.H. DODGION, *Administrator*

(702) 687-4670
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Administration
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STATE OF NEVADA
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Waste Management
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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

October 23, 1997

MEMORANDUM

To: Bob Kelso
From: Valerie King VK

Re: Kerr-McGee request to increase volume/rate of injection into UIC-permitted trenches

The draft letter from WPC to Kerr-McGee regarding their request to increase the injection rate was sent to you today via internal mail. Jim, Cathe, and I would like to schedule a meeting with you at your earliest convenience prior to sending this letter to Kerr-McGee. At this time we can discuss the various perspectives related to this facility and ensure that both bureaus are coordinated in their efforts.

Thanks, Bob.

OSMONICS

CORPORATE HEADQUARTERS

5951 Clearwater Drive
Minnetonka, MN 55343-8995 USA

Phone (612) 933-2277
Fax (612) 933-0141

October 17, 1997

VIA FAX: (702) 651-2250 AND COURIER

CONFIRMATION COPY

Mr. Everette Spore
KERR-MCGEE CHEMICAL CORPORATION
8000 West Lake Mead Drive
Henderson, NV 89015

Re: Pilot Study

Dear Everette:

Thank you for your input during the conference call on Wednesday. Per our conversation we wanted to provide Kerr-McGee with preliminary design and price information for a two-pass reverse osmosis (RO) system to concentrate perchlorate.

The sketch enclosed (Sketch A) summarizes the work performed during the Application Test. From the Application Test we basically obtained information on what type of membrane elements provide the best separation. In this case a cellulose-acetate membrane was chosen since it is resistant to the oxidizing nature of the perchlorate. We were able to obtain preliminary information on fluxrate (flow rate of water, through the membrane element, per square area), pressure required, and permeate quality.

We then utilize the flux rate data to determine approximately how many membranes are required to meet Kerr-McGee's flow demands, and we use the pressure to determine the approximate pump size and operating pressure. We use the permeate quality as a guide to how successful the separation is.

One note of caution with this information. An Application Test is just a guideline to base estimates of capital cost. The pilot study will provide a better understanding of the dynamics of the system and long-term operation.

cont...

From the Application Test we found that the approximate flux-rate for the membrane elements was 8-10 gfd (gallons per square foot per day). Based on a flow rate of 100 gpm and assuming a 90% recovery on the first pass and an 80% recovery on the second pass a conceptual design can be put forward as shown in Drawing B. In order to produce 112 gpm out of the first pass we estimate a requirement of 60 membrane elements (sepralators) based on 8.5 gfd. The second pass will require 36 sepralators to produce 90 gpm based on 10 gfd.

We estimate the capital equipment cost for (2) two-pass RO skids to be $700,000-$850,000. The pre-treatment and post-treatment equipment is typically around 30% of the capital cost of the membrane system. However the post-treatment requirements for this application are not yet well understood. Using the 30% rule it then would result in a capital estimate of $1-1.2 million.

We have also analyzed the operating cost of the two-pass RO system (see Attachment C). We expect an operating cost of around $6.00/1000 gallons, less than $0.01/gallon.

If the results of the Application Test and capital/operating cost estimates justify further evaluation, Osmonics would recommend on-site pilot work using actual feed solution.

Osmonics is proposing to deliver a pilot program which includes two 80B-XX RO systems and CIP system, and exchangeable activated carbon and anion resin tanks. Also included with the pilot equipment will be two weeks of start-up services and on-site assistance. The specifications enclosed show the dimensions of the RO skid and the electrical and piping requirements. We can provide a 2-month study for $35,000-$40,000.

We should note that the feedback from our carbon vendor is that activated carbon has a short life expectancy when reacted with perchlorates. Carbon does work well initially as an ion exchange media, but this effect quickly wears off. We believe that it would be beneficial to test carbon in a pilot study, but we can not guarantee its performance for this application. Calgon is willing to participate as a technical reference during the pilot study.

Everette, Osmonics provides pilot services as a means of promoting the sale of full-scale equipment. There is very little profit in performing this work. We would not want to move forward unless there is a realistic chance of incorporating RO technology into Kerr-McGee's final treatment solution.

cont...

Let's get together early next week to discuss. We look forward to working with you and the folks at Kerr-McGee on this project. If you have any questions please feel free to contact me at (714) 362-0088, Ext. 6795.

Sincerely,

OSMONICS, INC.

David J. Nicholls
Sales Engineer
Engineered Products & Systems

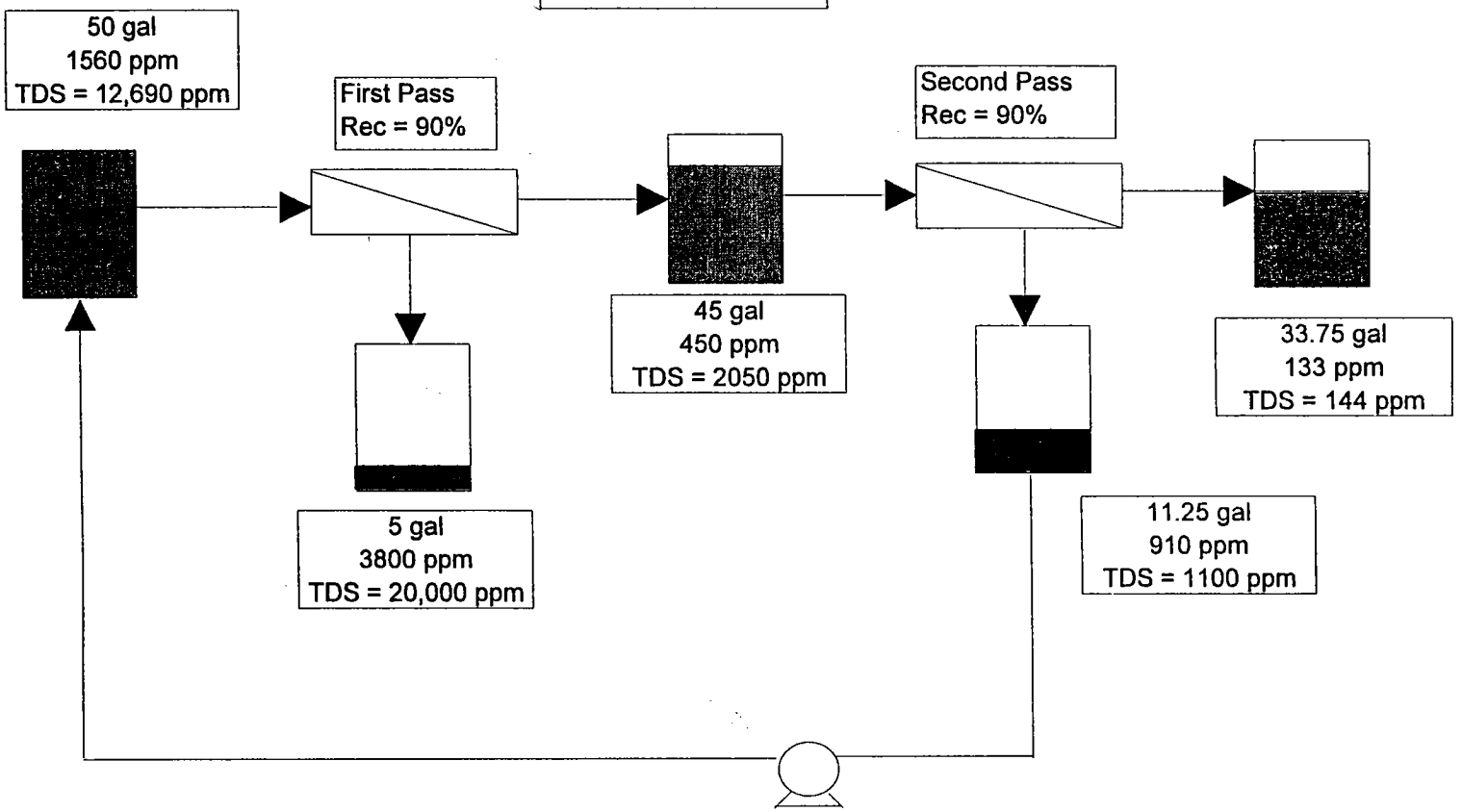
DJN/br

Encl: Flow Diagrams
Specifications
Operating Cost
Standard Conditions of Sale
Warranty/Guarantee

cc: Mr. Curtis D. Weitnauer, Manager Engineered Products & Systems Business Development, OSMONICS, INC.
Mr. Matthew E. Hofacre, Application Engineer, Engineered Products & Systems, OSMONICS, INC.
Mr. Owen K. Hopkins, Application Development Engineer, OSMONICS, INC.

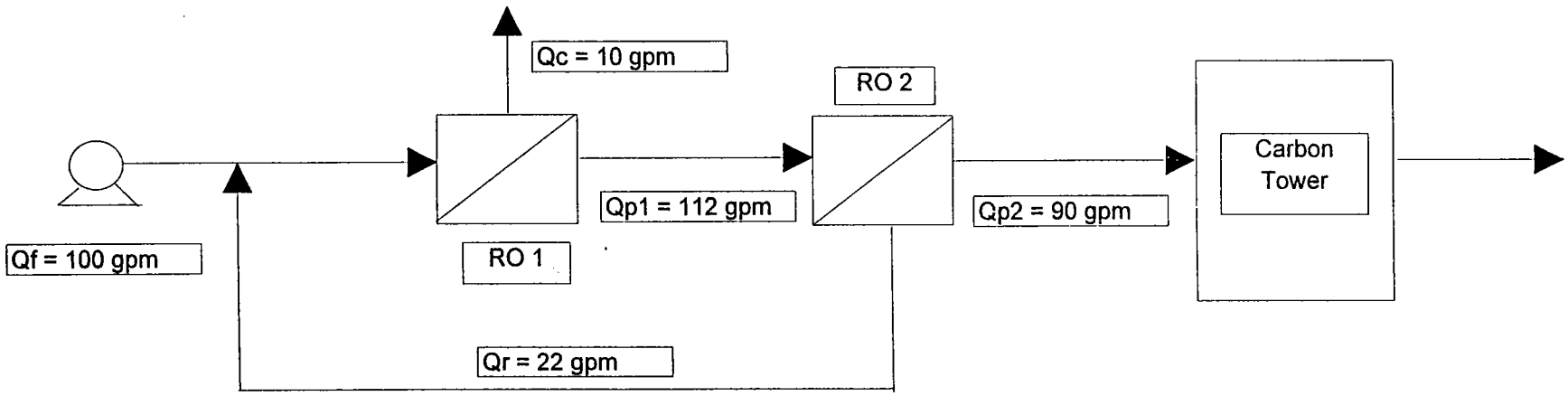
Application Test Flow Diagram

Attachment A



Flow Schematic

Attachment B



Recovery 1st Pass 90%
Recovery 2nd Pass 80%

Printed by Bob Kelso 10/17/97 1:14pm

From: BPOHLMAN @ NDEP-LV (Brenda Pohlmann)
To: Bob Kelso
Subject: Timet Report

====NOTE==========10/17/97 11:20am=

Howdy,
In yesterday's meeting with KMCC and Pepcon, we discussed in pretty good detail various reports that are available that they might want to get a hold of which will give them some details on hydrogeology. I spoke to Karl about some reports that he was aware of and he mentioned a report that was done by DRI in 1984 that he thought would be useful. He couldn't get me a copy of it however, because Timet made the report confidential and they can't release it. He was wondering if we might have it already in our files.

The reference is:
Fordham, Koltermann, and Hess, 1984. Groundwater Monitoring Plan: Part 1 - Review of Site Hydrogeology and Existing Monitoring Network, prepared for Timet, Inc., prepared by Water Resources Center, DRI.

If we don't have it then maybe we could suggest that KMCC ask Timet for a copy.

---

not found

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

October 13, 1997

Ms. Valerie King
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0851

Dear Ms. King:

Subject: UIC Permit #NEV94218 Permit Modification

Kerr-McGee Chemical Corporation (KMCC) maintains an Underground Injection Control (UIC) Permit #NEV94218 for remediation of groundwater at the Henderson Nevada facility. KMCC is requesting written approval from the Division for modification of its UIC permit, Part I.A., to include introduction of fresh water (Lake Mead water) into the injection/recharge trenches. This modification will allow KMCC to determine the capacity of the treatment plant and the recharge trenches.

Fresh water addition will occur at either the inlet or discharge of the groundwater treatment plant at a rate up to 175 gallons per minute. By comparison, flow through the treatment plant/recharge system has historically been between 40 and 140 gallons per minute. Water levels will be observed on a monthly basis in monitor wells downstream of the recharge trenches and compared with historical water level data prior to the 1986 Consent Order for groundwater remediation. If at any time surface wet spots appear downstream of the trenches or the water level approaches the pre-treatment conditions, the addition of fresh water will be tapered back or discontinued. All other conditions of the permit will continue to be met.

It is not the intent of KMCC to impact the groundwater elevations but merely to determine the capacity of the recharge trenches and flow through the groundwater treatment plant. Your approval is recommended.

If you have any questions regarding this matter please contact either Susan Crowley at (702) 651-2234 or Mark Porterfield at (702) 651-2239.

Sincerely,

Patrick S. Corbett
Plant Manager

By certified mail
cc: SMCrowley
RANapier
MJPorterfield
Doug Zimmerman (NDEP)

Comments on "Semi-Annual Performance Report, Chromium Mitigation Program, Kerr-McGee Chemical Corporation, Henderson, Nevada, January-June 1997" dated July 28, 1997.

Figure 6

According to the performance report, the "M-70 series wells show a gradual increase or leveling off in chromium concentrations..." In the next sentence (Page 4), a conclusion is drawn that the **decline** in chromium concentrations (in the M-80 series wells) can be attributed to the efficient functioning of the extraction and recharge portions of the ground water treatment system. It is interesting to note that no conclusions are drawn concerning the increase in chromium concentrations in the M-70 series wells. So, here is my conclusion:

The **increase** in chromium concentrations in the M-70 series wells suggests that the extraction system is not fully capturing the contaminant plume. Using M-71 as an example, it can be seen that in 1990, the concentration of total chromium was less than 1 mg/L. Currently, the concentration of total chromium is 17 mg/L. As shown on Figure 6, the increase has been gradual but fairly constant (almost linear, except for a drastic increase in late 1991/early 1992). What this suggests to me is that the "1 mg/L" concentration line shown on Plate 1 has moved from a location near M-71 to its current location north (downgradient) of M-85 (a distance of at least 300 feet). Therefore, based on the data, it appears that the plume continues to move downgradient (to the north), past the extraction system. It seems reasonable to conclude that the plume is NOT being pulled upgradient (to the south), back toward the extraction system. If this were happening, Figure 6 would show a decrease in the concentrations of total chromium. Again, this is easy to visualize on Plate 1: if the plume were moving upgradient, the "10 mg/L" concentration line would be moving south, which would cause the concentration to eventually drop from its current level (17 mg/L) to 10 mg/L, and then from 10 mg/L to 5 mg/L, and so forth. Figure 6 shows just the opposite.

Figure 7

According to the performance report, the decline in chromium concentrations (shown on Figure 7) can be attributed to the efficient functioning of the extraction and recharge portions of the ground water treatment system. While this statement may be correct, it is also possible that the "trend" shown on Figure 7 is a mere reflection of the plume geometry that cannot be shown on Plate 1 (due to the lack of control points south of the recharge trenches). Because the change in chromium concentrations has been small (no more than 10 mg/L), it is possible that the "10 mg/L" concentration line actually extends further downgradient than the location shown near M-87 (as an example). By simply redrawing the concentration lines in a different configuration, it is possible to

explain why the chromium concentrations in the M-80 series wells have decreased--and it has nothing to do with the recharge trenches. In fact, if the "5 mg/L" concentration line were redrawn to encircle M-84, M-85, and M-86, it would be readily apparent why the concentrations in M-84 and M-86 are decreasing: a small, isolated "outlier" with a concentration greater than 0 but less than 5 mg/L is moving past the these two wells.

Plate 1

This is quite possibly the first site I have ever seen where a considerable amount of time and effort has been spent to define the extent of contamination and then the information available goes unused when the remediation system is designed. I do not understand the concept of waiting for the plume to migrate to the extraction system, rather than placing the extraction system where the contamination is greatest. At the rate the plume appears to be moving, it could take another ten years before the actual "hot spot" reaches the extraction system. Maybe KMCC should be asked to prepare a ground water model which documents that the contamination as we know it today will actually reach the extraction system.

Oct. 9, 1997

Pat Corbett BLP
Kerr McGee Susan Crowley DZ

Development of workplan
- Gathering of existing information
- Possibly geophysical survey or limited drilling
- Identify data gaps
- Maybe incorporate site into Consent Agreement

Will try to schedule joint meeting w/ AmPac and KM to discuss issues that are common to both parties.

Necessary Resources:
maps, GPS data, geophysical survey

Joint meeting will be used to discuss details of work that needs to be conducted & what tools will be needed to collect necessary data.

Grappling w/ whether they should go ahead and install a treatment system at the existing intercept well treatment plant.

Joint meeting may happen late next week.

- Pat Corbett will talk to Jim Gibson & discuss the idea of a joint meeting. Joint meeting will be used to discuss details of what needs to be in a workplan.

Beginning of Nov. for workplan & probably 6 months

time frame for accomplishing work outlined in Nov. 1 ~~t...rtr...s~~.

MEETING KERR - McGEE 9/16/97

Region IX

(1) Aerial Reconnaissance ? Hazardous Waste Pollution Sources - BMI industrial Complex — Henderson, Nevada
1943 - 1979

EMS - LV Project AMD-7980

D.R. Williams - Lockheed

July 1980

(2) - Well C37
conductivity 20,000 ND

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

September 12, 1997

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlman:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical Corporation's activities regarding the perchlorate issue:

- KMCC prepared an on-site sampling plan which NDEP reviewed and commented on. The sampling was completed and results are currently being formatted into a report. NDEP, through their consultant IT, collected split samples at the sampling locations and will be able to compare the KMCC results to their own, providing information on the reproducibility of the analytical method for perchlorate.
- KMCC is preparing a sampling plan for soil to evaluate the impact of perchlorate on stormwater discharges to the Pittman Bypass.
- KMCC has initiated an investigation into remedial alternatives for reduction of perchlorate concentrations in water. A status summary of that report is attached and several treatment technologies are under evaluation.

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,

Patrick S. Corbett
Plant Manager

By certified mail
cc: SMCrowley
EMSpore
TWReed
RANapier
ALDooley
Robert Kelso
Doug Zimmerman

smc\Status to Pohlmann091297.doc

Technology Review

Biodegradation

The use of bacteria has been shown to reduce perchlorate and chlorate in water up to 15,000 ppm from bench scale to pilot scale. This technology is patented by the USAF and the transition to the private sector is under way. Patents in progress and pending in the private sector will make the industrial use of this technology easier. Treatability and operability testing is underway with our groundwater to characterize the necessary chemistry and economics of the anaerobic bioreactor. Pending successful testing of 2 months duration a decision will be made regarding pilot and scale up of this technology.

Catalytic Hydrogen Reduction

Hydrogen catalysis is a rather large body of scientific study. Hydrogen ion can be used to reduce chlorate and perchlorate in a catalysis reactor. Reactor (bench scale) design is underway and testing will continue for about 2 months duration. The proper catalyst for reaction with hydrogen in the presence of our groundwater is necessary for successful reduction of the chlorate and perchlorate contaminants. There also exists the possibility that electrochemical enhancement of the hydrogen catalysis reactor may be successful. Pending successful testing of either or both of these methods, scale up and evaluation will then be made.

Electrochemical Reduction

Utilizing proper current densities and preconcentration of the perchlorate and chlorate ions, reduction could be effected in an electrochemical cell. Chlorate reduction has been shown to occur on an iron cathode under the right environmental conditions. Perchlorate may also be reduced with the proper selection of cathode materials, such as tin, and precious metals, with minimal environmental effects. Low concentration of wastewater chlorate and perchlorate cannot be reduced because of diffusion control at the surface of the cathode due to hydrogen production. The use of an air cathode may eliminate this problem and solve the reduction problem. If these tests are successful, then further evaluation and scale up will be made.

Reverse Osmosis

Reverse Osmosis may be used to remove the chlorate and perchlorate from the groundwater. This is not a destruction technology and will have to be operated in concert with another destruction process. It is possible that the use of reverse osmosis membranes can be used with electrochemical reduction to effect concentration of chlorate and perchlorate for final reduction. Testing is underway to asses the level of removal of chlorate and perchlorate from the groundwater. Membrane selection and testing will take about 2 weeks to determine with testing beginning in October. Pending successful selection of a membrane and testing, further evaluation will be undertaken.

Ozonation

Ozonation has been discussed as a possible reduction method which has been successful with some chlorate streams from pulp mills. This is a technology which has not been tested with reduction of perchlorate. The levels of concentration of chlorate and perchlorate are not known at which ozonation is successful. This technology could be used with an RO system if proven successful in reduction. Testing of ozonation will be conducted in October on the groundwater

sample of chlorate and perchlorate. If this technology is successful, it will be evaluated with an RO system as pre-treatment.

Granular Activated Carbon

Granular Activated Carbon (GAC) has been used semi-successfully at a water treatment plant in Southern California for removal of perchlorate from well water. The mechanism of this process is unknown, although speculation is that bacteria from groundwater is attaching itself to the organic carbon and reaction with perchlorate is a secondary reaction at the surface of the carbon. Further test work on carbon type with our groundwater will be completed in October to determine if the reaction can be duplicated with our groundwater and bacteria to reduce chlorate and perchlorate. Further tests and evaluation will be made if this method is successful.

Ion Exchange

Ion Exchange (IX) can be used to remove chlorate and perchlorate from groundwater, although preconcentration may have to be made. IX does not reduce the perchlorate , but does remove it from the water. Testing will be accomplished during the next 2 month period to determine IX's effectiveness in removal of both ions. Further tests and evaluations will be completed if the method is found to be successful.

Ecological Systems

Initial planning is underway to test an ecological system for reducing chlorate and perchlorate. This process uses the natural plants and bacteria to reduce chlorate and perchlorate and remediate the resultant sludge from the bateriological process. This method is in the early stages of development and will be tested if the preliminary bench scale tests are found to be successful. This process is very successful with food wastes, but has minimal industrial applications, because it is very new (1992). If further testing is warranted beyond the bench scale, pilot testing will be needed to prove performance before full scale implementation.

DEPARTMENT OF CONSERVATION & NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
555 E. WASHINGTON, SUITE 4300
LAS VEGAS, NEVADA 89101
(702) 486-2850 FAX: 486-2863

MEMORANDUM

DATE: *September 9, 1997*

TO: *Allen Biaggi*

FROM: *Nadir E. Sous*

SUBJECT: *The Kerr-McGee Chemical Corporation plant Joint Inspection*

. . . . . .

This is to confirm our telephone conversation regarding the joint inspection in the next week or so of the Kerr-McGee plant at Henderson. Attached is a copy of my annual compliance inspection report that was performed jointly by Mr. Gerald Klug of EPA region 9 and myself on March 17, 1997. Mr. Klug commented that he was really very impressed by how well the ponds system was maintained and operated.

Report of Compliance Inspection

Facility:	Kerr-McGee Chemical Corp.
Date:	March 17, 1997
Participants:	Susan Crowley, KMCC Mark Porterfield, KMCC Gerald Klug, EPA Nadir Sous, NDEP
Discharge Permit No:	NV0000078
Permitted Flow Limit:	5.0 MGD

This is the 30 day average limit of the total volume discharged from outfalls 001 and 002 except during stormwater discharges.

Discharge Monitoring Report Problems:

Discharge Monitoring Reports (DMR's) for this facility were reviewed for a one year period from January 17, 1996 through December 31, 1995. Violations of the following parameters were reported, as follows:

Month/Year	Outfall	Parameters
	All	None

No excursions in pH, TDS or Flow were reported.

The stabilized water (BMI water supplied directly from Lake Mead, filtered, with copper sulfate added, not disinfected) distribution system is approximately 40 years old. Many leaks in this old water system have plagued the four BMI companies (KMCC, Pioneer, Timet, and Chemstar Lime) for the past 10 years. Kerr-McGee has noted in past DMR's that leaks have contributed to excessive flows at outfall 002. Recent maintenance efforts, however, have resolved many of these leaks.

The Kerr-McGee Chemical Corporation at Henderson

The Ker-McGee Chemical Corporation at Henderson, Nevada is a manufacturer of specialty inorganic chemical products. Produced at the plant are sodium chlorate, perchlorate, manganese dioxide, boron products.

The Henderson facility is a zero discharge plant with all waste process water going to either evaporative ponds or two vapor comression units. All storm water events are monitored through two (2) monitor units. Common sanitary sewage is discharged to Hedersons' sanitary sewer.

Treatment Units:

Impoundments	Application	Liner	Comments
Pond AP-1	Sodium perchlorate and ammonium perchlorate filter wash.	Top liner-60 mil HDPE Bottom liner-40 mil HDPE	Solids were moved and a new HDPE liner was installed early in 1994. Operating successfully.
Pond AP-2	Sodium perchlorate and ammonium perchlorate	Single PVC liner with reinforced butyl sides	Presently out of service. Inactive solids were moved to AP-6. Closure of pond is complete.
Pond AP-3	Sodium perchlorate and ammonium perchlorate filter wash. It is a pump basin for AP-1.	Top liner-60 mil HDPE Bottom liner-40 mil HDPE	Liquid present between liners, due to a hole in the primary liner of Pond AP-1.
Pond AP-4	Ammonium perchlorate, cooling tower waste and salt crystallizer wash-out.	Top liner-60 mil HDPE Bottom liner-40 mil HDPE	Solids to be moved to AP-6. Can receive overflow from AP-1 and it can discharge to AP-5.
Pond AP-5	Ammonium perchlorate, and cooling tower waste.	Top liner-60 mil HDPE Bottom liner-40 mil HDPE	Receives overflow from AP-4 and AP-1, when necessary.

Impoundments	Application	Liner	Comments
AP-6	To collect sodium perchlorate and ammonium perchlorate from AP-1 and remaining solids from AP-2.	Top liner-60 mil Bottom liner-40 mil	Collect and consololidate all AP products
Pond P-2	Sodium chlorate solution.	Top liner dual - 36 mil hypalon and 60 mil HDPE Bottom liner 30 mil PVC	Pond is closed,with liner and earthen materials removed. Replaced with above ground tanks in 1995.
Pond P-3	Previously held sodium chlorate solution.	Was reinforced butyl rubber.	Pond is closed, with liner and earthen materials removed. Sampling for closure procedure pending action by NDEP/BOCA.
Pond Mn-1	MnO_2 cell filter waste, cathode wash solution with sodium phosphate.	Top liner-60 mil HDPE Bottom liner-4"-6" compacted bentonite clay, with 10^{-8} cm/sec permeability	Will remain in service.

Pond C-1	Presently, is out of service. Previously received boiler plant effluent.	Was single PVC liner with reinforced butyl sides.	Not in service. Solids were removed to landfill.
Pond WC-West	Brine discharge from vapor recompression Units, boron neutralization waste, boiler plant blow down, and washdown.	Top liner-60 mil HDPE Bottom liner-40 mil HDPE.Side liner-105 mil geotextile polypropylene, HDPE netting, 40 mil HDPE	Aerators put in to discourage wildlife propagation and is apparently working. Receives vapor compression waste.

Impoundments	Application	Liner	Comments
Pond WC-East	Receives all plant wastewaters, i.e. cooling tower blowdown, steam generation blow down, process wastes softeners, MnO_2 clarifier overflow.	Same as WC-West	Solution is pumped back to vapor compression units. Clean recycled water is then used for cooling and processes.

Treatment System	Application	Comments
Pressure Leaf Filter Press	Provide removal of SS from residue consisting of diatomaceous earth with entrapped SS and AP that goes to Pond AP-1.	Plans are to provide a possible second filter to capture ammonium perchlorate from diatomaceous earth. Should be operationl by mid 1997.
Vapor compression Units (2)	Treat wastewaters to allow for the recycling of water throughout the facility for cooling and process uses.	Aluminum turbine blades were to be replaced with stainless steel. However, recent operation has shown that curved aluminum blades are satisfactory.
Hexavalent Chromium Groundwater Remediation and Reinjection facility	Intercept impaired groundwater and treat it for Cr^{+6}; then reinject to groundwaters of the State.	Because of continuous problems with the reinjection trench system, a new recharge gallery system was built and trenches have been renovated.

Changes Since Last Inspection:

- C-1 pond, the solids were tested and found to be non hazardous. The solids were hauled to Apex landfill for disposal, liners were removed and both ponds were put out of service.

- P-2 pond all solids were hauled to hazardous waste site for disposal, the liner was removed and the pond was put out service.

- The new above ground steel tanks to replace P-2 pond are in service.

Problems and Deficiencies:

- Lime dust from Chemstar Lime Co. contributes to higher pH and TDS in flows at out-fall 001 and 002 during storm events.

- Pond AP-6 the liner has a tiny hole, monitoring indicated a slight leak.

Proposed Changes:

-The following improvements are planned in the near future (within 2 to 3 months) at the following impoundments:

Impoundment	Improvement
Pond AP-3	Top liner to be repaired

- Kerr-McGee's long-term plans include the abandonment, with associated closure procedures, of all AP (ammonium perchlorate) ponds. This includes AP-1, AP-2, AP-3, AP-4, and AP-5. In lieu of these ponds, plans are to use one large double-lined pond. This over-all plan eliminates several ponds and significantly reduces the problems related to O & M of ponds.

Recommendations:

- Build a new boiler to use generated condensate to genrate steam and reduce the purchase of outside steam.

- Kerr McGee should continue with the improved O & M activities at the ponds and with the flow meter/sampling equipment.

- NDEP encourages the implementation of long range plans to minimize number of ponds in service, utilizing either a new large pond or the incorporation of tanks.

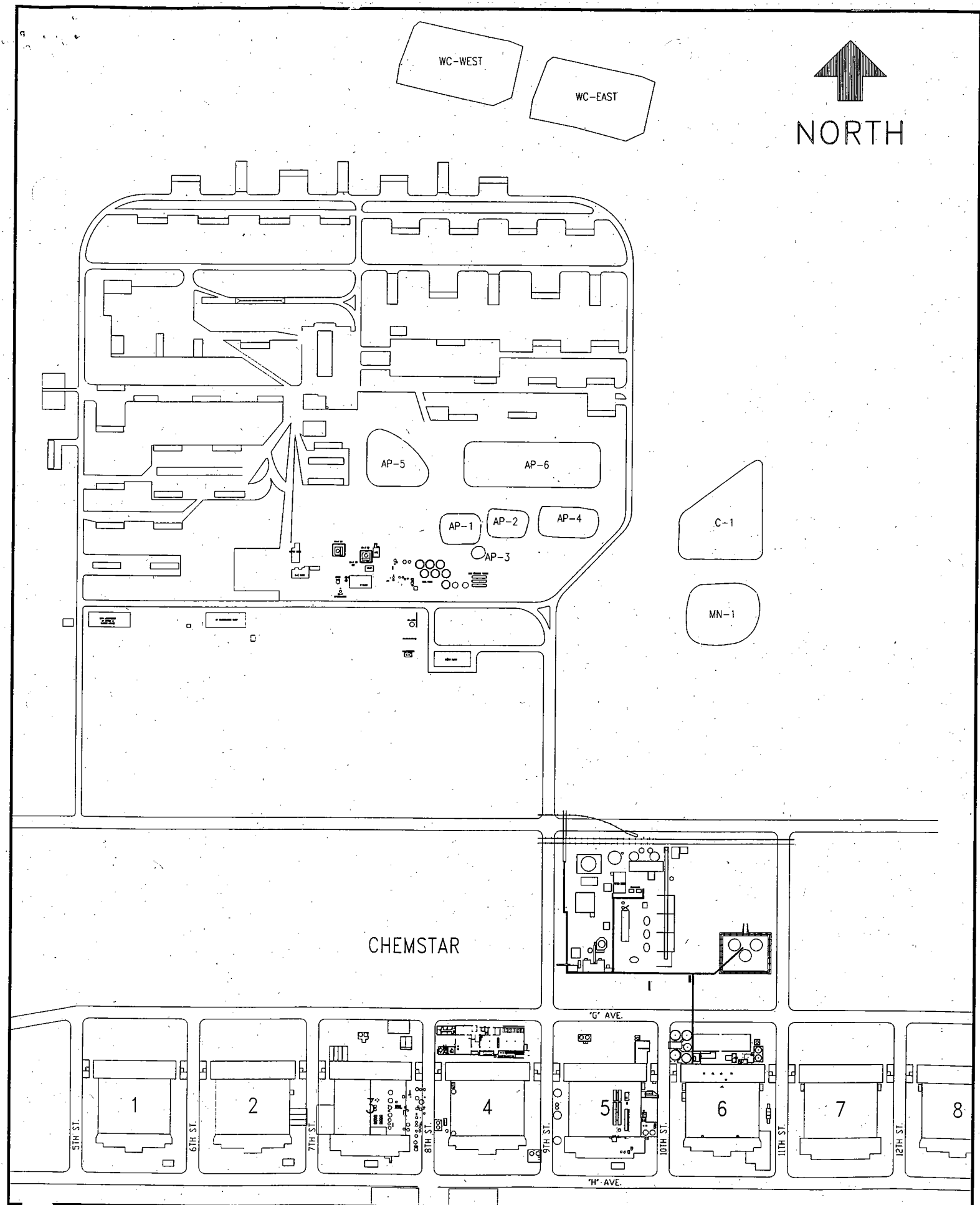
- A minimum freeboard depth of 2 feet should be maintained at all ponds, as stipulated in the NPDES Permit, in order to minimize the danger of any overflow.

- Kerr-McGee should investigate measures along with Chemstar Lime Co., to minimize the spread of fugitive lime dust which impacts Kerr_McGee's permit requirements at outfall 001 and 002 in terms of pH and TDS.

- Submit plans and specifications for all improvements or modifications to all wastewater treatment works at the Kerr-McGee Henderson facility to NDEP for review and approval prior to start of construction. This is required by Nevada Revised Statute 445.214.2.

Any errors or omissions or concerns contained in this report should be directed to NDEP.

cc : Darrell Rasner, NDEP
Susan Crowley, Kerr-McGee
Gerald Klug, EPA



KERR-McGEE CHEMICAL CORP. HENDERSON, NEVADA

DRAWN BY: GM BUCO	JOB NO.	PLOT PLAN HENDERSON FACILITY	DRWG. NO. SK-050697
SCALE: NONE	A.F.E.		
DATE: May 5, 1997	APP.		

GES
GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.

PROVIDING
- Geotechnical Engineering
- Construction Materials Testing
- Environmental Site Assessments

September 5, 1997
File No. 96189V2

Mr. Jeff Gibson
Pacific Engineering & Production Company of Nevada (PEPCON)
3770 Howard Hughes Parkway, Suite 300
Las Vegas, Nevada 89109

RE: Proposed Well Development and Sampling Protocol for Perchlorate in the Vicinity of the Former PEPCON Plant.

Dear Mr. Gibson:

As we discussed on Tuesday September 2, 1997, Geotechnical & Environmental Services, Inc. (GES, Inc.) is presenting our proposed protocol for soil sampling, well development and groundwater sampling for perchlorate in the vicinity of the Former PEPCON Plant.

Currently, GES, Inc. is in the process of installing five 4-inch diameter monitoring wells in the vicinity of the Former PEPCON Plant. Each of these wells will be constructed with a screened interval using 0.02 inch slots extending approximately 10 feet above and 10 feet below the groundwater table. The filter pack will be environmental grade No. 3 washed and kiln dried monterey sand.

SOIL SAMPLING

GES, Inc. will obtain soil samples at approximately 5-foot intervals for the top 20 feet in each boring using a drive sampler. We then plan to obtain one sample at a depth of approximately 50 feet, if possible. These soil samples will be stored in sealed brass sample tubes at 4°C for a 28 day holding period. At this time, no plans for testing have been made for the soil samples.

WELL DEVELOPMENT

GES, Inc. plans to develop the wells using a mechanical surging and pumping method in general accordance with the standard practice outlined in American Society for Testing and Materials (ASTM) D 5092-90. After surging the well with a surge block, we will pump the well until representative water, free of drilling fluids, cuttings, or other material introduced during well construction is obtained. Water sampling will be performed at least 48 hours after well development is completed.

GROUNDWATER SAMPLING

Groundwater sampling will be performed in general accordance with ASTM D 4448-85a. Prior to sampling, we will purge the well by pumping 5 to 10 times the volume of the well. We will then obtain four 500 ml samples from each well using disposable teflon bailers. A new bailer will be used for each well. Of these four samples, two will be submitted to PEPCON, one will be submitted to NDEP, and one will be submitted to a private laboratory for perchlorate testing.

DECONTAMINATION

GES, Inc. will perform decontamination procedures in between each well location for all equipment that will contact the soil or groundwater at each well.

We will double rinse all auger, drilling bits and drilling pipe, soil sampling equipment, and the surge block using first tap water with a biodegradable phosphate-based cleaning solution and then clean tap water.

Prior to well development and groundwater sampling, GES, Inc. will first pump at least 20 gallons of a biodegradable phosphate-based cleaning solution through the pump and tubing. We will then pump at least 20 gallons of purified water through the pump and tubing.

During decontamination procedures, GES, Inc. will obtain one 500 ml sample of: the tap water, the purified water, the cleaning solution, and the drilling foam. Each of these liquids will be submitted to PEPCON to be tested for perchlorates.

Our services were performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable engineering firms in this or similar localities. No other warranty, either express or implied, is included or intended in this letter.

"I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances."

We appreciate the opportunity to provide our services. Please feel free to contact our office if you have any questions or comments regarding the information presented.

Sincerely,

Geotechnical & Environmental Services, Inc.

Gregory P. DeSart, P.E., C.E.M.
President

GPD:cmc

Dist: 1 faxed to addressee @ 735-4876
1 original mailed to addressee
1 cc to project file

Sept. 3, 1997
Pat Corbett, Kerr McGee Plant Manager
Susan Cowley, KM Environmental Manager
Doug Zimmerman
Brenda Pohlmann
Lori Ertler

Kerr McGee was only manufacturer of AP in BMI. This assessment flows into environmental conditions investigation which is already underway

Can KM start looking at treatment options - chromium remediation system already in place. KM has looked into several treatment options already. Bioremediation appears to be a viable option.

Kevin Mayer est. 400 lb/day entering Lake Mead. Chromium treatment is providing 360 lb/day. Pitman Bypass is 25 lb/day ← May be residual in Beta Ditch or other sources of ClO_4^- in system.
Unlined flow comes onto property continues off KM as unlined ditch - before Boulder Hwy goes into BMI siphon which is a pipe - goes under BH to Pitman Bypass. Water is stormwater runoff

Doug would like them to try and collect data to identify source of ClO_4^- being found in Pitman B.

1,000 ppm sample collected at chromium treatment system was effluent - however electrolytic cell will have no effect on ClO_4^-. Samples have already been submitted to biological treatment co. Currently, KM analyzes for ammonia to monitor and do 1:1 calculation for ClO_4^-. KM bought ion chromatography but is not impressed w/ it. They feel difference we're seeing in LAS & MW data is indicative of problems w/ IC method.

Susan and Pat said that it would be OK for us to put our purge water in one of their drums.

Scheduling:
Week from Friday - status report which will include analytical info & where they are w/ evaluation of treatment options.

Susan does not feel that there is a current release and that all ClO_4^- is from historical disposal.

Take in NaCl from Great Salt Lake. Electrolytically split & make chlorate. Make crystalline slurry & do another electrolytic process to make

$$NaCl \rightarrow \underset{\text{chloride}}{Cl^-} \rightarrow \underset{\text{hypochlorite}}{ClOH} \rightarrow \underset{\text{chlorate}}{ClO_3} \rightarrow \underset{\text{perchlorate}}{ClO_4^-}$$

Robert Mayfield 293-4416

dumping below where Pioneer Chemical is now located.

Some of his job was cleanup - put material from basement in drums & would put in a dump. Unit 4 leaked perchlorate, C-feed (?) also leaked. Material shoveled out of basement & put into 55-gal drums & taken to dump. Were trained to operate garbage truck - would pick up mud from process - would put in dumpster & take to dump - Silver State wouldn't take it. Late the material was put into plastic-lined trucks & taken to Beatty, NV.

Last 2 trucks to fire when dumping was occurring.

Chlorate pond along fenceline w/ Tinet - NE area corner leaked

85-86 closed dumps

Worked for KMCC 75-90

Susan,

We will have IT follow along and take splits of 10-11 samples. NDEP will be there for a while but probably not the whole time.

Regional Sampling

Todd's Sunset Plaza Truck Stop
Sunset + Parkson
Furthest east well in Sunset ND for BTEX and MTBE (low conc.)

Several wells along Moser in Pittman area
Larry Butler at NERL
John Baker at Lockheed

LVW0001	~~ET~~ ~~100~~	1.05 mg/L perchlorate
0003		1.68
5	1.04	
7	.513	Pittman Bypass
9	.01	
DKC0001	.014	
11	.011 mg/L	
13	.047 mg/L	
15	.014 mg/L	

method blank NL

LVW0001 dup 1.05 + 1.06
matrix spike 89%
blank spike 96%

Don't have results from Mont. Watson
Don't have conductivity yet - will be late this morning - concern W/ interference.

AP Pond monitoring wells found perchlorate

Ken McGee is going to do sampling 46 wells. Good representative sampling of entire property.

637 13 well before paleochannel - needs to be sampled

We need H12 + H17 at Power sampled

295-2457 Mike O'Hagan
295-2194 Cindy Dutro

Sampled Sunset Truck Plaza
#6 at Rhodes Ranch

Notice to Proceed w/ new $ figure.
Purchased bladder pump for $1800.00

will expect report which includes operational history, quantities of water going to Lake Louise, tied in to local hydrogeology...

Sylvia

Leaching ponds out at KM near AP plant

Older care facility behind Skyline. Ponds were there to leach out chemicals.

Is concerned about health affects on people living in Pitman.

Is concerned about conc. of AP in ponds

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

August 21, 1997

Mr. Greg Schlink
Basic Management, Inc.
P.O. Box 2065
Henderson, NV 89009

Dear Mr. Schlink:

Subject: Kerr-McGee Phase II Report

Enclosed is a copy of Kerr-McGee Chemical Corporations Phase II Report. Please share this information with those in your organization that have an interest.

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

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Enclosure

cc: FRStater w/o attachment
PSCorbett "
RHJones "
RANapier "
PBDizikes "
TWReed "

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

August 7, 1997

Mr. Robert Kelso
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Transmittal Letter for the Phase II Work Plan Report

Dear Mr. Kelso:

Subject: Phase II Report

Kerr-McGee Chemical Corporation (KMCC) submitted a Phase II Work Plan to Nevada Division of Environmental Protection (NDEP) in October 1996, describing field work designed to fill in data gaps identified in Phase I of the Environmental Conditions Assessment. NDEP has approved this Work Plan, and field work was undertaken in April 1997.

Enclosed are two copies of the Phase II Work Plan report. This report describes field work and the resulting analytical information.

Please feel free to call me at (702) 651-2234 if you have any questions related to the Phase II Work Plan report. Thank you.

Sincerely,

Susan Crowley Jr

Susan Crowley
Staff Environmental Specialist

Enclosures
cc: PDizikes
RHJones
RANapier
TWReed
JT Smith, Covington and Burling
FRStater

SMC\PHASE II REPORT COVER LETTER 7.DOC

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

97 JUL 22 AM 10:31

July 18, 1997

Mr. Robert Kelso
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Kelso:

Subject: KMCC Environmental Conditions Investigation Quarterly Report

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Kerr-McGee Chemical Corporation (KMCC), KMCC submits the following quarterly progress report for the KMCC Henderson Environmental Conditions Investigation.

Activities Conducted 04/01/97 to 06/30/97

Field sampling described by the Phase II Work Plan was completed the week of April 7, 1997.

Construction of the Phase II Report is in progress.

Please feel free to call me if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By certified mail
cc: GDChristiansen
PSCorbett
PRDemps
PBDizikes
RHJones
HISSC Technical Subcommittee
HISSC Legal Subcommittee
RANapier
TWReed
RSimon (ENSR)
JTSmith (Covington & Burling)

SMC\Quarterly (7-97) Progress Report to Kelso.doc

Schedule for Phase II Report Preparation
May 1, 1997

Date	Task	Responsibility	Status
4/11/97	Field sampling.	ENSR	Complete
4/25/97	Surveying of sample locations	SMC	Complete
5/23/97	Analytical results returned from lab	LAS lab / SMC	
5/27/97	Analytical distributed to ENSR and KMCC (TechCenter)	SMC	
6/27/97	KMCC internal analytical QA/QC check	DAWard	
6/27/97	Draft Phase II Report submitted to KMCC for review	ENSR	
7/10/97	Comments related to Phase II Report returned to ENSR	SMC	
7/24/97	Revised draft Report returned to KMCC for review	ENSR	
7/31/97	Comments related to revised Report returned to ENSR	SMC	
8/6/97	Final Report submitted to KMCC for review	ENSR	
8/7/97	**Final Phase II Report due to NDEP**	**SMC**	

smc\Schedule for Phase II Report Preparation.doc

Kmcc

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

July, 1997

Mr. Doug Zimmerman
State of Nevada
Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89710

Dear Mr. Zimmerman:

Subject: First Half 1997 Performance Report - Chromium Mitigation Program

Enclosed are two copies of the First Half 1997 Semi-Annual Chromium Mitigation Program Report for the Kerr-McGee Chemical Corporation, Henderson facility.

This report presents information regarding the groundwater interception, treatment, and recharge systems of the chromium mitigation program.

If you have any questions or comments concerning this information, please contact me at (702) 651-2234.

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

Enclosures (2)
By certified mail
cc: PSCorbett
WJGanus (w/o attachment)
Joe Livak (NV Division Environmental Protection)
RANapier
MJPorterfield (w/o attachment)
TWReed
FRStater

SMC\GWRT0697.doc

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

April 30, 1997

Mr. Robert Kelso
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Environmental Conditions Investigation Quarterly Report

Dear Mr. Kelso:

Pursuant to Section XIII of the Consent Agreement, signed September 5, 1996, between Nevada Division of Environmental Protection (NDEP) and Kerr-McGee Chemical Corporation (KMCC), KMCC submits the following quarterly progress report for the KMCC Henderson Environmental Conditions Investigation.

Activities Conducted 01/01/97 to 03/31-97

KMCC submitted a Phase II Work Plan to NDEP in October 1996, describing field work designed to fill in data gaps identified in Phase I of the Environmental Conditions Assessment. NDEP approved this Work Plan upon conditions specified in a February 4, 1997, letter from NDEP to KMCC.

KMCC submitted a response, dated April 3, 1997, to the February 4 NDEP comments which related to the Work Plan's field sampling. These modification to the Work Plan were approved by NDEP.

Field sampling was conducted the week of April 7, 1997.

Please feel free to call me if you have any questions. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

cc: GDChristiansen
PSCorbett
PRDemps
PBDizikes
RHJones
HISSC Technical Subcommittee
RANapier
TWReed
RSimon (ENSR)
JTSmith (Covington & Burling)
HISSC Legal Subcommittee

smc\Quarterly (1-97) Progress Report to Kelso.doc

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

April 3, 1997

Robert Kelso
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Work Plan Modifications

Dear Mr. Kelso:

Kerr-McGee Chemical Corporation (KMCC) submitted a Phase II Work Plan to Nevada Division of Environmental Protection (NDEP) in October, 1996, describing field work designed to fill in data gaps identified in the Phase I of the Environmental Conditions Assessment. NDEP has approved this Work Plan upon conditions specified in a February 4, 1997 letter from NDEP to KMCC.

This correspondence is intended to confirm our telephone conversation on March 5, 1997, during which those comments which might impact Phase II field work were discussed. These were comments 13, 14, 15, 16, 18 and 19. On March 5, we came to following resolutions:

Comment 13. Section 2.3.2, page 2-4 - As we review records of the P-2 and P-3 decommissioning, it is difficult to determine the underlying soil volume which was removed from the ponds. Records show only that the residual solids together with the liner and any visually contaminated soil, was removed to US Ecology for disposal. There was not a distinction made between loads of solids, liner or soils. We do, however, know that there was no fill material brought into the excavations. The surface soil remaining in the area of the old P-2 and P-3 ponds is as it was left after the decommissioning.

KMCC proposes to modify the Section 2.3.2 of the Phase II Work Plan (Ponds P-2 and P-3) to include collection of 0-12 inch soil samples, as well as the originally proposed 24-36 inch soil samples. All 0-12 inch samples will be analyzed for total chromium and soil pH. Also, one boring from the P-2 set of samples and one boring from the P-3 set of samples will be chosen at random from which the 24-36 inch sample will be analyzed for total chromium and soil pH. In addition, if any 0-12 inch sample indicates a level of total chromium which would have the potential to exceed the TCLP threshold, the 24-36 inch sample for that boring will also be analyzed for total chromium and soil pH.

Comment 14. Section 2.3.3, page 2-5 - The selection of nitrate for groundwater samples collected from monitor wells M-17, M-25 and M-89 was at the direction of NDEP. It was NDEP's concern that $NH4ClO_4$ would degrade to nitrate. It should be noted that since

1985, monitoring of these same wells was required by the KMCC Henderson NPDES permit. Monitoring was ongoing until 1996, to demonstrate that the single-lined pond, AP-2 (decommissioned in early 1996), did not impact the shallow aquifer. Monitoring for pond constituents (NH_4ClO_4, NaCl, specific conductance and pH) was required. No changes are expected in the Work Plan related to this comment.

Comment 15. Section 2.3.4, page 2-6 - KMCC originally proposed the depth of 24-36 inches to sample soil that had been unaffected by tilling. KMCC proposes to amend the Work Plan to include collection of the 0-12 inch boring increment and submit this for analysis as well as the 24-36 inch increment.

This area, although not within the KMCC controlled fenceline, is not readily accessible to the public. It is not beside (or even visible from) a public road. Attached is hand written information from a previous terminal manager which led KMCC to believe that truck degreasing and/or washing was done offsite. However, to address the possibility that this type of material might be present , KMCC proposes to expand the analyte list to include Total Petroleum Hydrocarbon (TPH, by Method 8015, Modified) and Volatile Organics (VOC, by Method 8240).

Comment 16. Section 2.3.7, page 2-7 - Please see the KMCC response to Comment 15 above. KMCC believes, based upon information from the terminal manager (a non-KMCC employee), that truck washing and degreasing, involving any solvents, was done offsite. However, again to address the possibility that this activity *might* have been done on-site, KMCC proposes to expand the analyte list for this area to include TPH and VOC.

Comment 18. Section 2.3.10, page 2-9 - Old drawings related to the Hardesty operation indicate that a small tank farm was located to the north of the Unit 2. The proposed monitoring well, M-97, will be drilled downgradient to the north of the area where the tank farm is indicated on the old drawings. To verify/refute the presence of kerosene in the proposed groundwater well, KMCC proposes to add TPH to the original analyte list for this well. In addition, KMCC proposes to add total arsenic to the original list of analytes.

KMCC proposes to do only lithologic sampling of the soil boring while installing the proposed well because we have no indication that the well location was used for production operations. The location was chosen to be downgradient from the tank farm and Unit 2 operations to determine groundwater impacts from possible contaminant migration from the site, and so would not have soil impact from either source.

Comment 19. Section 3 - Collected soil samples are not usually taken in duplicate due to sample variability. Water samples collected for this effort will be few, considerable less than 20, not warranting duplicates. Please see modifications of Section 3.4 of the Work Plan for a description of the laboratory QA/QC and field blanks.

Purge water and excess soils will be containerized until characterized for disposition.

The revised Sections 2 and 3 of the Work Plan are attached along with a revised Table of Contents. Please retain the Figures from the previous Work Plan version as these have not changed. Also attached is a red-lined version of Sections 2 and 3, to facilitate your review of the revisions.

Remaining NDEP comments, related to the Written Response and/or the Work Plan will be addressed in a correspondence to follow.

To indicate your agreement with these resolutions to comments related to field work, please sign below and return a copy of this correspondence to me.

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

Sincerely,

Kerr-McGee Chemical Corporation

Susan M. Crowley

4/10/97

Robert Kelso
Nevada Division of Environmental Protection

smc\KMCC Resonse to 2-4-97 Kelso Comments.doc
cc: GDChristiansen
PSCorbett
PRDemps
PDizikes
RHJones
RANapier
TWReed
RSimon (ENSR)
JTSmith (Covington & Burling)

Susan Crowley 8/5/97 ENSR

#13. P-2/3 sampling depth (24-36) [annotated: ← 5 samples – 8 samples]
0-12, 24-36
analyze all 0-12 ~~24-36~~ 24-36 if in 0-12
no fill
soil removed? 1 ea for 24-36 also

#14 initiate per Allan & Ed?
happy to delete.

#15 add 0-12 also
area filled to preclude dumping

#16 add TPH and VOC's also

#18 add TPH, arsenic, VOC's, SVOC's for water.
detergent → pickup by conductivity
chlorinated paraffin - TPH or non migrate
far enough north that nothing expected.
monitor & test if necessary.
(sample)

17th layout/mapping
18th-19th - real start.

ENSR → brass sleeve vs acrylic?

FAXED 4-18 2/7/97

KERR McGEE CHEMICAL CORPORATION

Henderson, Nevada

Facsimile request

To:			From:	Susan M. Crowley
	GD Christiansen	MT-2004		
	PS Corbett	Henderson		
	PR Demps / Dizikes	MT-1004	Location:	Henderson, NV
	RH Jones	MT-2003		
	RA Napier	MT-1604		
	TW Reed	MT-2004	Phone:	KMNet 531-2234 Fax 531-2310
	JT Smith	Covington & Burling		(702) 651-2234 Fax (702) 651-2310
	R Simon	ENSR		

Total number of pages (including facsimile request): 4

Subject: KMCC Henderson Phase II Work Plan

This may be anti-climactic now - but Bob Kelso did return the signed agreement with our Work Plan modifications. I'm working on a response to the other comments, and will circulate this as available.

Thanks! SM Crowley

Note: Please call originator if transmission is impaired.	Date Sent:	Time Sent:	Fax Oper:

INTERNAL CORRESPONDENCE

KMCC
Henderson

TO	Distribution	**DATE**	February 7, 1997
FROM	S.M. Crowley x2234	**SUBJECT**	KMCC Phase II Work Plan

TWReed RHJones GDChristiansen PRDemps RANapier JTSmith PSCorbett

Attached is Bob Kelso's response to our revised Phase II Written Response and Work Plan. We apparently have approval of the documents, "upon conditions specified in the attached NDEP Comments". These new comments are attached to this memo.

Although the biggest concern, contaminated soil under Unit 4 and 5, seems to have been put to rest, at least for now, there still appears to be some unresolved issues. I will give everyone several days to digest the comments, then call a teleconference to determine where we go from here. Hopefully, we can arrive at some reasonable responses.

Thanks.

smc\C:\1SMC\WPDOCS\ECA\NDEPCOM.WPD

Contact Rick Simon

PETER C. MORROS, Director
L.H. DODGION, *Administrator*
(702) 687-4670
TDD 687-4678
Administration
Mining Regulation and Reclamation
Water Pollution Control
Facsimile 687-5856
Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Air Quality
Water Quality Planning
Facsimile 687-6396
Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

February 4, 1997

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

Subject: Phase II Work Plan/LOU - Approval with Comments

Dear Ms. Crowley:

The Division has received and reviewed the revised Phase II Work Plan and LOU Response (dated October 14, 1996 and September 30, 1996, respectively) prepared for the KMCC Facility in Henderson, Nevada. It should be noted, the Division considers the combined Phase II Work Plan and LOU Response to be the "workplan" required by the Phase II Consent Agreement. Therefore, this Workplan is approved upon the conditions specified in the attached NDEP Comments.

Please do not hesitate to contact me or Doug Zimmerman at (702) 687-4670, extension 3020 and 3127 respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

Attachment: KMCC Revised Phase II Work Plan - NDEP Comments

cc w/attach:
D. Zimmerman, NDEP
W. Frey, DAG
Ms. Terre Maize, IT Corporation, 4330 South Valley View, Suite 114, Las Vegas, NV 89103-4047
Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

KMCC Revised Phase II Work Plan

NDEP Comments

LOU Responses

1. LOU Item #3, page 4 - KMCC's response states that "...no information on historical deposition...." is available for comparison. Provide any current/recent data submitted to Clark County regarding air emissions from the facility and the submittal schedule.

2. LOU Items #16 and #17 - Page 14: Provide analytical results verifying all contaminated soil was removed and properly disposed of during the 1995 decommissioning of AP2.
- page 16: Provide the rationale for not sampling MW-17, -25, and -89 for chromium. Provide the schedule for installation and implementation of the "new system" designed to eliminate the need for the AP Ponds (Ref. page 15, paragraph 2).

3. LOU Item # 20, page 18 - Discharges to Pond C-1 were stopped in October 1994 to allow the pond contents to dry. Per the LOU response, the liner and dried pond sludge were characterized and sent to the Silver State Landfill, but confirmatory sampling was not completed. Provide the liner and sludge characterization data and the date characterization was completed. Provide a schedule for completion of the confirmatory sampling plan forwarding to the Division for approval? Provide the Bureau of Corrective Actions with a copy of the transmittal letter and the plan when it is submitted.

4. LOU Item # 47, page 30 - KMCC's response regarding the health effects of manganese exposure is unclear. Is KMCC unaware of exposure studies because these studies have not been performed by KMCC, have not been performed by anyone or have not been searched for in the literature? Is any data available to interpret the average exposure levels recorded in 1995? Are these levels good, bad, acceptable, harmful,...? Provide clarification.

5. LOU Item #56, page 34 - Based on the information provided in Attachment 19, the Division agrees with KMCC's conclusion that the perchlorate ion is inert and generally does not react with other compounds in the soil or groundwater. Keep the Division apprised of your attempts to obtain additional references and provide copies when they are received. It should also be noted that the first paper in Attachment 19 consists of even number pages only.

6. LOU Item #62, page 38 - Provide a copy of the letter to State Industries and their response when received.

7. LOU Item #67, page 41 - Provide further information on the investigation, sampling, and/or analysis performed during or after removal of the trash and debris from the Delbert Madsen Site to assess and characterize any contamination, specifically hydrocarbons. The Phase I Report refers to the site as a "storage and salvage yard...for old vehicles and wrecked vehicles."

8. LOU Item #68, page 42 - KMCC's original response to this item stated Nevada recycling has been notified of lease termination effective December 1996. The September 30, 1996, response indicates the lease will likely be renewed on a yearly basis for some time to come. The existence of a lease is insufficient, in itself, to delay remediation of any contamination until the property is vacated. If the lease has been renewed and the property will be occupied beyond December 1996, it is strongly suggested that KMCC inspect the property for possible releases and acceptable housekeeping activities, and take appropriate actions as may be required.

Workplan

9. Section 2.2.1, page 2-1 - "EPA Method 8015" should read "EPA Method 8015 Modified (8015M)" for consistency with requirements and Table 1d. Correct the remainder of the document as necessary.

10. Section 2.2.2, page 2-2 - It should be noted, when analytical results are received they may be statistically evaluated (i.e. SW-846, Equation 8) to determine if the appropriate number of samples were collected and the assumption of homogeneity is correct.

11. Section 2.2.2, last paragraph (page 2-3) - Provide the criteria that will be used to determine the need for TCLP analyses?

12. Section 2.3, page 2-3 - The last two paragraphs contain apparent typographical errors - "wereconstructed" and "???impoundments." Correct as appropriate.

13. Section 2.3.2, page 2-4 - Provide the rationale for the 24-36 inches sampling depth in Old P-2 and P-3. How much underlying soil was removed and disposed at U.S. Ecology? Was any fill placed in the excavations? If so, how much?

14. Section 2.3.3, page 2-5 - The rationale for nitrate sampling in wells MW-17, -25, and -89 appears to be limited to the fact it is specifically required by the LOU. Is this correct? Provide a discussion of additional analyses that might provide more useful information?

15. Section 2.3.4, page 2-6 - Again, provide the rationale for sample depths of 24-36 inches. Provide construction details of the east, west, and south side berms and the origin of the berm material? What does "inorganic type materials" mean? Provide the information from "a previous terminal manager" that resulted in metal and Ph testing only. Was this manager a KMCC employee? The Phase I Report states this area was outside of the fenced and guarded KMCC facility, and accessible to Pioneer, BMI, Koch, Saguaro, NuBulk Transportation, J.B. Kelly and Chemstar among others. If access was uncontrolled, why are metal and pH analyses deemed sufficient to define the extent of possible contamination?

16. Section 2.3.7, page 2-7 - Specifically address the use of the J.B.Kelly Site as a truck washing and maintenance facility as described in the Phase I Report, and the potential for cleaning and degreasing solvent contamination as a result of these operations. Justify limiting samples to metals and pH only.

17. Section 2.3.8, page 2.8 - Was any sampling performed to verify that no 1,1,1-TCA contamination was present around the AP maintenance shop? If not, should sampling be considered?

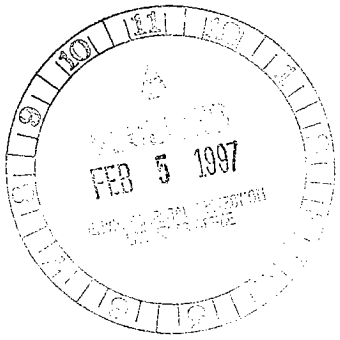
18. Section 2.3.10, page 2-9 - Provide additional information regarding soil sampling to verify that no residual contamination remains from the kerosene and benzene USTs. The monitoring well should also be sampled for TPH to verify/refute the presence of kerosene. Provide the location of this proposed monitoring well (MW-97). Why does KMCC only propose lithologic sampling of the soil boring? Per KMCC's response to LOU Item #4, projected products from the site include monochlorobenzene, paradichlorobenzene, soda arsenite solution, synthetic detergent, and chlorinated paraffin. Provide the proposed sampling/analysis plan for these compounds.

19. Section 3 - There is no reference to collection of duplicates, blanks, spikes or other quality control samples, with the exception of four samples for field pH, temperature and conductivity, and only rinsate and trip blanks are specified for groundwater samples. For aqueous samples, it is standard practice to collect duplicate samples, and volatile samples usually require a field blank. Commonly, one quality control sample is collected per 20 samples of each matrix or sample group. Please explain. Also, provide the planned disposition of purge water and excess soils.

20. Sections 3.2.2.1 and 3.3.2.1 - It should be noted that samples collected for volatile organic compound analysis may not be composited.

21. Section 3.5, page 3-16 - Well installation/abandonment procedures should be in accordance with NRS 534.010 through 534.340 and NAC 534.010 through 534.470, Regulation for Water Well and Related Drilling.

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



January 31, 1997

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Kelso:

Subject: KMCC Phase II Consent Agreement - Attachment C Revision

Kerr-McGee Chemical Corporation (KMCC) signed a Consent Agreement with Nevada Division of Environmental Protection (NDEP) earlier in 1996, establishing the process for proceeding with Phase II of an Environmental Conditions Assessment. Earlier in January, KMCC submitted Attachment C, a property description of the Henderson site, to NDEP. That Attachment C has been updated with information from a survey (resulting in typographical changes) and Quit Claim review (resulting in exclusion of a piece of property). Attached here is a revised Attachment C.

At least one more revision of this Attachment C is expected as transfer of property to the City of Henderson for the Warm Springs Road right-of-way is completed.

Feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM-1428
Staff Environmental Specialist

Attachment
By certified mail
cc: Brenda Pohlmann (NDEP)
PRDemps
RHJones
RANapier
TWReed
JTSmith (Covington & Burling)
Verrill Norwood (Pioneer)
Joel Mack (Montrose)
Susan Stewart (TIMET)
Kent Stevenson (Pioneer) - w/o attachment
Lee Erickson (Stauffer) - w/o attachment
Mike Reilly (Zeneca) - w/o attachment
Barry Sandles (Morrison & Foerster - TIMET) - w/o attachment
PSCorbett
R. Simon (ENSR)
David Tundermann (Parsons, Behle & Latimer - BMI) - w/o attachment
Greg Schlink (BMI)

SMC\PHIICA~1.WPD

ATTACHMENT C

LEGAL DESCRIPTION
(Page 1 of 2)

KERR-MCGEE CHEMICAL CORPORATION (KMCC)
HENDERSON, NEVADA

I, W. C. Haynes, Registered Civil Engineer, do hereby certify that this map is a true and accurate plat of the land surveyed and staked out under my direct supervision at the instance of the Western Electrochemical Company of Nevada, owner of said parcel of land, that the location of all property corners have been definitely established and perpetuated in strict accordance with the law as shown hereon, that the property, comprising 90.53 acres, more or less, is a portion of what is commonly known as the Basic Magnesium Project, located in the County of Clark, State of Nevada, Township 22 South, Range 62 East, Mount Diablo Base and Meridian, and more particularly described as follows:

Beginning at the Northeast corner of Section 13, thence North 89°00'00" West 1195.57 feet along the North line of Section 13 to a point which is the true point of beginning; Thence South 8°51'37" East 637.87 feet to a point; Thence South 81°08'23" West 20.00 feet to a point; Thence North 8°51'37" West 335.75 feet to a point; Thence South 81°08'23" West 260.00 feet to a point; Thence North 8°51'37" West 65.00 feet to a point; Thence South 81°08'23" West 34.00 feet to a point; Thence North 8°51'37" West 6.00 feet to a point; Thence South 81°08'23" West 12.00 feet to a point; Thence South 8°51'37" East 6.00 feet to a point; Thence South 81°08' 23" West 64.00 feet to a point; Thence South 8°51'37" East 1.50 feet to a point; Thence South 81°08'23" West 212.00 feet to a point; Thence South 8°51'37" East 63.50 feet to a point; Thence South 81°08'23" West 548.00 feet to a point; Thence South 8°51'37" East 120.00 feet to a point; Thence North 81°08'23" East 350.00 feet to a point; Thence South 8°51'37" East 215.75 feet to a point; Thence North 81°08'23" East 637.00 feet to a point; Thence South 8°51'37" East 126.25 feet to a point; Thence South 81°08'23" West 454.00 feet to a point; Thence South 8°51'37" East 232.50 feet to a point; Thence North 81°08'23" East 454.00 feet to a point; Thence South 8°51'37" East 40.00 feet to a point; Thence South 8°08'23" West 454.00 feet to a point; Thence South 8°51'37" East 1167.50 feet to a point on the North boundary line of the B.M.P. entrance road; Thence North 81°08'23" East 454.00 feet along the North boundary line of the B.M.P. entrance road to a point; Thence South 8°51'37" East 200.00 feet to a point on the South boundary line of the B.M.P. entrance road; Thence South 81°08'23" West 554.00 feet along the South boundary line of the B.M.P. entrance road to a point; Thence North 8°51'37" West 100.00 feet to a point on the center line of the B.M.P. entrance road; Thence South 81°08'23" West 1238.00 feet along the center line of the B.M.P. entrance road to a point; Thence North 8°51'37" West 1591.50 feet to a point; Thence South 81°08'23" West 740.00 feet to a point; Thence North 8°51'37" West 508.50 feet to a point; Thence North 81°08'23" East 355.00 feet to a point; Thence North 8°51'37" West 555.00 feet to a point; Thence South 81°08'23" West 355.00 feet to a point; Thence North 8°51'37" West 116.01 feet to a point along North line of Section 13; Thence South 89°00'41" East 1278.81 feet along the North line of Sector 13 to the North quarter corner of Section 13; Thence South 89°00'00" East 1456.55 feet along the North line of Section 13 to the true pont of beginning, containing 94.33 acres more or less, all of which ties in the North one half of said Section 13, saving and excepting therefrom a surrounded area described as follows:

Beginning at the North quarter corner of Section 13, thence South 0°05'03" West 528.98 feet along the North-South center line of Section 13 to a point which is the true point of beginning; Thence North 81°08'23" East 2.27 feet to a point; Thence South 8°51'37" East 29.00 feet to a point; Thence North 81°08'23" East 325.00 feet to a point; Thence South 8°51'37" East 120.00 feet to a point; Thence South 81°08'23" West 691.00 feet to a point; Thence South 8°51'37" East 49.00 feet to a point; Thence South 81°08'23" West 362.00 feet to a point; Thence North 8°51'37" West 234.00 feet to a point; Thence North 81°08'23" East 362.00 feet to a point; Thence South 8°51'37" East 65.00 feet to a point; Thence North 81°08'23" East 341.00 feet to a point; Thence North 8°51'37" West 29.00 feet to a point; Thence North 81°08'23" East 22.73 feet to the true point of beginning, containing 3.86 acres, more or less.

Survey completed November 3, 1952.

W. C. Haynes
Registered Civil Engineer
Nevada License No. 448

U:\LEGALDES.WPD
Revised February 3, 1997

LEGAL DESCRIPTION

KERR-MCGEE CHEMICAL CORPORATION (KMCC)
HENDERSON, NEVADA

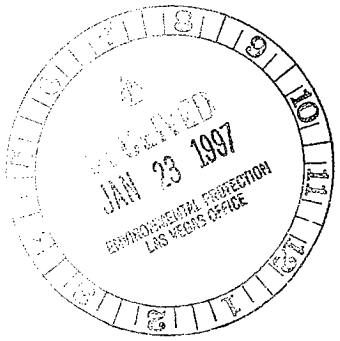
Description as taken from Quit Claim Deed dated March 15, 1962 and recorded March 23, 1962 in Official Records Book No. 349, Instrument No. 282224, between United States of America and American Potash and Chemical Corporation, for a 151.3689 acre parcel at northern end of KMCC Property.

That certain property being a portion of what is commonly known as the Basic Magnesium Project in the County of Clark, State of Nevada, and more particularly described as follows:

PARCEL NO. 1

Beginning at the Section corner common to Sections 1, 2, 11 and 12, Township 22 South, Range 62 East, M.D.B. & M.; thence North 1° 16' 15" West 1314.14 feet along the West line of Section 1; thence leaving said West line South 89° 36' 55" East 1252.59 feet more or less to the Southwesterly line of Athol Avenue as shown on the Plat of Sierra Vista City, recorded in Book 2 of Plats, page 5, Clark County, Nevada records; thence South 42° 27' 00" East 41.39 feet along said Southwesterly line; thence leaving said Southwesterly line South 0° 47' 53" East 1285.42 feet to a point on the South line of said Section 1; thence South 89° 31' 45" East 1269.30 feet along said South line to theQuarter corner common to said Sections 1 and 12; thence leaving said South line South 0° 53' 32.5" West 1317.21 feet; thence South 89° 33' 08" East 753.00 feet to a point on the West boundary of Eleventh Street projected; thence South 8° 51' 37" East 767.34 feet along said West boundary to a point on the North fence line of B.M.P.; thence leaving said West boundary North 63° 17' 49" West 387.59 feet along said North fence line to an angle point therein; thence continuing along said fence line North 84° 13' 42.5" West 3118.39 feet to the West line of Section 12; thence North 2° 07' 00" East 1615.32 feet along said West line to the point of beginning, containing 151.3689 acres, more or less.

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



January 20, 1997

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Phase II Consent Agreement - Attachment C

Dear Mr. Kelso:

Kerr-McGee Chemical Corporation (KMCC) signed a Consent Agreement with Nevada Division of Environmental Protection (NDEP) earlier in 1996, establishing the process for proceeding with Phase II of an Environmental Conditions Assessment. Attached is the Attachment C to that Agreement, a property description of the Henderson site.

Feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM-1428
Staff Environmental Specialist

Attachment
By certified mail
cc: Brenda Pohlmann (NDEP)
PRDemps
RHJones
RANapier
TWReed
JTSmith (Covington & Burling)
Verrill Norwood (Pioneer)
Joel Mack (Montrose)
Susan Stewart (TIMET)
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PSCorbett
RSimon (ENSR)
David Tundermann (Parsons, Behle & Latimer - BMI) - w/o attachment
Greg Schlink (BMI)

SMC\PHIICACL.WPD

ATTACHMENT C

I, W. C. Haynes, Registered Civil Engineer, do hereby certify that this map is a true and accurate plat of the land surveyed and staked out under my direct supervision at the instance of the Western Electrochemical Company of Nevada, owner of said parcel of land, that the location of all property corners have been definitely established and perpetuated in strict accordance with the law as shown hereon, that the property, comprising 90.53 acres, more or less, is a portion of what is commonly known as the Basic Magnesium Project, located in the County of Clark, State of Nevada, Township 22 South, Range 62 East, Mount Diablo Base and Meridian, and more particularly described as follows:

Beginning at the Northeast corner of Section 13, thence North 89°00'00" West 1195.57 feet along the North line of Section 13 to a point which is the true point of beginning; Thence South 8°51'37" East 637.87 feet to a point; Thence South 81°08'23" West 20.00 feet to a point; Thence North 8°51'37" West 335.75 feet to a point; Thence South 81°08'23" West 260.00 feet to a point; Thence North 8°51'37" West 65.00 feet to a point; Thence South 81°08'23" West 34.00 feet to a point; Thence North 8°51'27" West 600 feet to a point; Thence South 81°08'23" West 12.00 feet to a point; Thence South 8°51'37" East 6.00 feet to a point; Thence South 81°08' 23" West 64.00 feet to a point; Thence South 8°51'37" East 1.50 feet to a point; Thence South 81°08'23" West 212.00 feet to a point; Thence South 8°51'37" East 63.50 feet to a point; Thence South 81°08'23" West 548.00 feet to a point; Thence South 8°51'37" East 120.00 feet to a point; Thence North 81°08'23" East 350.00 feet to a point; Thence South 8°51'37" East 215.73 feet to a point; Thence North 81°08'23" East 637.00 feet to a point; Thence South 8°51'37" East 126.25 feet to a point; Thence South 81°08'23" West 454.00 feet to a point; Thence South 8°51'37" East 232.50 feet to a point; Thence North 81°08'23" East 454.00 feet to a point; Thence South 8°51'37" East 40.00 feet to a point; Thence South 8°08'23" West 454.00 feet to a point; Thence South 8°51'37" East 1167.50 feet to a point on the North boundary line of the B.M.P. entrance road; Thence North 81°08'23" East 454.00 feet along the North boundary line of the B.M.P. entrance road to a point; Thence South 8°51'37" East 200.00 feet to a point on the South boundary line of the B.M.P. entrance road; Thence South 81°08'23" West 554.00 feet along the South boundary line of the B.M.P. entrance road to a point; Thence North 8°51'37" West 100.00 feet to a point on the center line of the B.M.P. entrance road; Thence South 81°08'23" West 1238.00 feet along the center line of the B.M.P. entrance road to a point; Thence North 8°51'37" West 1591.50 feet to a point; Thence South 81°08'23" West 740.00 feet to a point; Thence North 8°51'37" West 508.50 feet to a point; Thence North 81°08'23" East 355.00 feet to a point; Thence North 8°51'37" West 555.00 feet to a point; Thence South 81°08'23" West 355.00 feet to a point; Thence North 8°51'37" West 116.01 feet to a point along North line of Section 13; Thence South 89°00'41" East 1278.81 feet along the North line of Sector 13 to the North quarter corner of Section 13; Thence South 89°00'00" East 1456.55 feet along the North line of Section 13 to the true pont of beginning, containing 94.33 acres more or less, all of which ties in the North one half of said Section 13, saving and excepting therefrom a surrounded area described as follows:

Beginning at the North quarter corner of Section 13, thence South 0°05'03" West 528.98 feet along the North-South center line of Section 13 to a point which is the true point of beginning; Thence North 81°08'23" East 2.27 feet to a point; Thence South 8°51'37" East 29.00 feet to a point; Thence North 81°08'23" East 323.00 feet to a point; Thence South 8°51'37" East 120.00 feet to a point; Thence South 81°08'23" West 691.00 feet to a point; Thence South 8°51'37" East 49.00 feet to a point; Thence South 81°08'23" West 362.00 feet to a point; Thence North 8°51'37" West 234.00 feet to a point; Thence North 81°08'23" East 362.00 feet to a point; Thence South 8°51'37" East 65.00 feet to a point; Thence North 81°08'23" East 341.00 feet to a point; Thence North 8°51'37" West 29.00 feet to a point; Thence North 81°08'23" East 22.73 feet to the true point of beginning, containing 3.86 acres, more or less.

Survey completed November 3, 1952.

W. C. Haynes
Registered Civil Engineer
Nevada License No. 448

UVLEGALDES

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

December 13, 1996

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

Dear Mr. Rosse:

Subject: Closed Hazardous Waste Landfill
1996 Post Closure Monitoring Results

Kerr-McGee Chemical Corporation's (KMCC) Henderson Facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in June 1996. 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 water quality represented a movement towards improved quality.

Notice of a statistically significant change of an up gradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). 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 up gradient and three down gradient wells to follow the groundwater quality in the closed hazardous waste landfill area. M-5 was the up gradient well. M-6, M-7 and H-28 were the down gradient wells. During the June 1996 post closure sampling, a statistically significant change from baseline of the historical **up gradient** 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, SpCd, TOC and TOX. This change is consistent with past sampling efforts. This same trend was apparent during 1991, 1992, 1993,1994 and 1995 monitoring.

All statistically significant changes from baseline detected in the **down gradient** monitoring wells described below reflect a groundwater **quality improvement** when compared to the 1982/83 baseline values of up gradient well M-5. Please see Table 1. All parameters, pH, SpCd, TOC and TOX moved in the direction of quality improvement in all three down gradient wells, M-6, M-7 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 up gradient 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.
2. A decrease in SpCd in M-5A, M-6A, M-7A and H-28.
3. A decrease in TOC in M-5A, M-6A, M-7A and H-28.
4. A decrease in TOX in M-5A, M-6A, M-7A and H-28.

As with the up gradient change from baseline, the down gradient 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 was apparent during 1991, 1992, 1993,1994 and 1995 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 S.M. Crowley at (702) 651-2234, if you have any questions.

Sincerely,

Patrick S. Corbett
Plant Manager

Attachments
By certified mail
cc: SMCrowley
RANapier
MJPorterfield

SMC\RCRA696.WPD

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring
1996

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	6/26/96	1708.41	ND	2.9	1.9	1700	3800	1800	<0.5	42.0	27.0	6.80	9220
										42.0	24.0	6.84	9400
										41.0	26.0	6.91	9490
										40.0	27.0	6.90	9490
							M-5A Average			41.3	26.0	6.86	9400
							M-5A Standard Deviation			0.8	1.2	0.04	110
							Background (M-5) *			62.3	47.7	6.34	10469
							M-5A t-Test			**0.85**	**2.60**	**2.38**	**9.96**
M-6A	6/25/96	1680.54	ND	0.12	0.12	1200	1800	1600	<0.5	2.2	1.4	7.40	5620
										1.4	1.5	7.39	5660
										1.2	1.5	7.40	5750
										1.7	1.5	7.40	5750
							M-6A Average			1.6	1.5	7.40	5695
							M-6A Standard Deviation			0.4	0.0	0.00	57
							Background (M-5) *			62.3	47.7	6.34	10469
							M-6A t-Test			**2.46**	**5.54**	**6.89**	**45.75**
M-7A	6/25/96	1683.56	ND	0.022	0.0074	1400	1700	1700	<0.5	1.3	25.0	7.60	6420
										1.4	25.0	7.44	6580
										1.6	24.0	7.38	6540
										1.6	23.0	7.41	6500
							M-7A Average			1.5	24.3	7.46	6510
							M-7A Standard Deviation			0.1	0.8	0.08	59
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			**2.47**	**2.81**	**7.20**	**37.90**
H-28	6/25/96	1690.18	0.015	100	1.8	1100	2500	420	<0.5	3.8	4.4	7.52	5320
										4.4	3.9	8.10	6030
										4.0	4.1	7.93	6250
										4.3	4.1	7.92	6200
							H-28 Average			4.1	4.1	7.87	5950
							H-28 Standard Deviation			0.2	0.2	0.21	373
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			**2.36**	**5.22**	**9.35**	**31.71**
Field Blank	6/25/96		ND	ND	ND	ND	ND	ND	<10	<1.0	<0.1	6.10	1

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

TABLE 2. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring - Resample Results

Well #	Date	Water Level (feet)	TOC (mg/l)	TOX (mg/l)	pH	Specific Conductance (umhos/cm)
M-5A	10/23/96	1708.33	25.00	22.00	7.00	9400
			22.00	20.00	7.10	9200
			20.00	24.00	7.00	9200
			26.00	22.00	7.10	9250
	M-5A Average		23.25	22.00	7.05	9263
	M-5A Standard Deviation		2.38	1.41	0.05	82
	Background (M-5) *		62.3	47.7	6.34	10469
	M-5 t-Test		**1.58**	**3.08**	**4.61**	**11.43**
M-6A	10/23/96	1681.09	1.30	1.70	7.30	5400
			2.00	1.90	7.40	5500
			1.70	1.80	7.30	5450
			1.50	2.00	7.30	5400
	M-6A Average		1.63	1.85	7.33	5438
	M-6A Standard Deviation		0.26	0.11	0.04	41
	Background (M-5) *		62.3	47.7	6.34	10469
	M-6A t-Test		**2.46**	**5.49**	**6.40**	**48.45**
M-7A	10/23/96	1682.41	1.20	20.00	7.30	6500
			1.30	17.00	7.40	6500
			1.10	22.00	7.50	6550
			1.10	19.00	7.40	6550
	M-7A Average		1.18	19.50	7.40	6525
	M-7A Standard Deviation		0.08	1.80	0.07	25
	Background (M-5) *		62.3	47.7	6.34	10469
	M-7A t-Test		**2.48**	**2.86**	**6.80**	**12.94**
H-28	10/23/96	1689.93	3.30	4.20	7.30	5400
			3.00	4.50	7.10	5300
			3.50	4.70	6.90	5800
			3.60	5.10	7.10	5700
	H-28 Average		3.35	4.63	7.10	5550
	H-28 Standard Deviation		0.23	0.33	0.14	206
	Background (M-5) *		62.3	47.7	6.34	10469
	H-28 t-Test		**2.39**	**5.16**	**4.81**	**42.15**
Field Blank	10/23/96		<1.0	<1.0	6.6	<1

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

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
Carson City, Nevada 89710

December 11, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Semi-Annual Performance Report - Chromium Mitigation System (Dated July 26, 1996)

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has reviewed the subject report and agrees this material is an acceptable response to NDEP's general comment on KMCC's Phase II Workplan. The Division does, however, have some questions and requests for future submittals.

1. For future submittals, please provide the following data in electronic format:

   - Available chromium data (total and hexavalent) (Tables 1 and 3)
   - Interceptor well discharge rates (Table 2)
   - Groundwater chromium treatment analyses (Table 4)
   - Groundwater elevations (Appendix A)

This submittal will facilitate the Division's statistical analysis of the data and a better understanding of the effectiveness of both the interceptor/recharge well system and the chromium treatment system.

2. Tables 1 and 3 present data from nine wells within the KMCC facility. What data is available from other wells within the facility? Is any hexavalent data available? Chromium speciation data (influent and effluent) may provide additional information to evaluate system effectiveness.

3. Have the analyses been performed by the same laboratory over the length of this submittal or have multiple laboratories been used?

4. What is the background (natural) concentration of chromium (total and hexavalent) in groundwater upgradient of the facility?

TABLE 2. KE: :GEE CHEMICAL CORPORATION - H: :RSON, NV
Hazaruous Waste Landfill Post Closure Monitoring - Resample Results

Well #	Date	Water Level (feet)	TOC (mg/l)	TOX (mg/l)	pH	Specific Conductance (umhos/cm)
M-5A	10/23/96	1708.33	25.00	22.00	7.00	9400
			22.00	20.00	7.10	9200
			20.00	24.00	7.00	9200
			26.00	22.00	7.10	9250
	M-5A Average		23.25	22.00	7.05	9263
	M-5A Standard Deviation		2.38	1.41	0.05	82
	Background (M-5) *		62.3	47.7	6.34	10469
	M-5 t-Test		**1.58**	**3.08**	**4.61**	**11.43**
M-6A	10/23/96	1681.09	1.30	1.70	7.30	5400
			2.00	1.90	7.40	5500
			1.70	1.80	7.30	5450
			1.50	2.00	7.30	5400
	M-6A Average		1.63	1.85	7.33	5438
	M-6A Standard Deviation		0.26	0.11	0.04	41
	Background (M-5) *		62.3	47.7	6.34	10469
	M-6A t-Test		**2.46**	**5.49**	**6.40**	**48.45**
M-7A	10/23/96	1682.41	1.20	20.00	7.30	6500
			1.30	17.00	7.40	6500
			1.10	22.00	7.50	6550
			1.10	19.00	7.40	6550
	M-7A Average		1.18	19.50	7.40	6525
	M-7A Standard Deviation		0.08	1.80	0.07	25
	Background (M-5) *		62.3	47.7	6.34	10469
	M-7A t-Test		**2.48**	**2.86**	**6.80**	**12.94**
H-28	10/23/96	1689.93	3.30	4.20	7.30	5400
			3.00	4.50	7.10	5300
			3.50	4.70	6.90	5800
			3.60	5.10	7.10	5700
	H-28 Average		3.35	4.63	7.10	5550
	H-28 Standard Deviation		0.23	0.33	0.14	206
	Background (M-5) *		62.3	47.7	6.34	10469
	H-28 t-Test		**2.39**	**5.16**	**4.81**	**42.15**
Field Blank	10/23/96		<1.0	<1.0	6.6	<1

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

KMCC

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

December 13, 1996

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

Dear Mr. Rosse:

Subject: Closed Hazardous Waste Landfill
1996 Post Closure Monitoring Results

Kerr-McGee Chemical Corporation's (KMCC) Henderson Facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in June 1996. 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 water quality represented a movement towards improved quality.

Notice of a statistically significant change of an up gradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). 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 up gradient and three down gradient wells to follow the groundwater quality in the closed hazardous waste landfill area. M-5 was the up gradient well. M-6, M-7 and H-28 were the down gradient wells. During the June 1996 post closure sampling, a statistically significant change from baseline of the historical **up gradient** 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, SpCd, TOC and TOX. This change is consistent with past sampling efforts. This same trend was apparent during 1991, 1992, 1993,1994 and 1995 monitoring.

All statistically significant changes from baseline detected in the **down gradient** monitoring wells described below reflect a groundwater **quality improvement** when compared to the 1982/83 baseline values of up gradient well M-5. Please see Table 1. All parameters, pH, SpCd, TOC and TOX moved in the direction of quality improvement in all three down gradient wells, M-6, M-7 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 up gradient 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.
2. A decrease in SpCd in M-5A, M-6A, M-7A and H-28.
3. A decrease in TOC in M-5A, M-6A, M-7A and H-28.
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As with the up gradient change from baseline, the down gradient 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 was apparent during 1991, 1992, 1993,1994 and 1995 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 S.M. Crowley at (702) 651-2234, if you have any questions.

Sincerely,

Patrick S. Corbett
Plant Manager

Attachments
By certified mail
cc: SMCrowley
RANapier
MJPorterfield

SMC\RCRA696.WPD

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring
1996

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)
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							M-5A t-Test			**0.85**	**2.60**	**2.38**	**9.96**
M-6A	6/25/96	1680.54	ND	0.12	0.12	1200	1800	1600	<0.5	2.2	1.4	7.40	5620
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										1.4	25.0	7.44	6580
										1.6	24.0	7.38	6540
										1.6	23.0	7.41	6500
							M-7A Average			1.5	24.3	7.46	6510
							M-7A Standard Deviation			0.1	0.8	0.08	59
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			**2.47**	**2.81**	**7.20**	**37.90**
H-28	6/25/96	1690.18	0.015	100	1.8	1100	2500	420	<0.5	3.8	4.4	7.52	5320
										4.4	3.9	8.10	6030
										4.0	4.1	7.93	6250
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							H-28 Average			4.1	4.1	7.87	5950
							H-28 Standard Deviation			0.2	0.2	0.21	373
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			**2.36**	**5.22**	**9.35**	**31.71**
Field Blank	6/25/96		ND	ND	ND	ND	ND	ND	<10	<1.0	<0.1	6.10	1

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

INTERNATIONAL
TECHNOLOGY
CORPORATION

November 1, 1996

Mr. Robert Kelso, P.E.
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Review of KMCC Response to the July 10, 1996 NDEP General Comment

Dear Mr. Kelso:

I have reviewed the Kerr-McGee Chemical Corporation (KMCC) response to the July 10, 1996 NDEP General comment. For comment response, KMCC submitted a July 22, 1996 letter "First Half 1996 Performance Report, Chromium Mitigation Project." My comments are enclosed.

If you have any questions regarding these comments, please call me or Terre Maize at 702-794-1700. Thank you for this opportunity to be of service.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances.

Sincerely,
IT CORPORATION

Michael D. O'Hagan

Michael D. O'Hagan, C.E.M.
CEM#: EM-1167, Expires 12-96

Comments on Kerr-McGee Chemical Corporation Letter Report "First Half 1996 Performance Report, Chromium Mitigation Project. "

General Comments

The Kerr-McGee letter report was submitted in response to the July 10, 1996, NDEP General comment - "Plates 1-3 show data that is approximately 3 years old. What changes have occurred in that time? Please update with current data."

In general, the Kerr-McGee letter report fulfills the comment. The following comments are directed towards the content of the letter.

For future submittals, submit the following data on disk:

A.) Available chromium data (total and hexavalent) (Tables 1 and 3)
B.) Interceptor well discharge rates (Table 2)
C.) Groundwater chromium treatment analyses (Table 4)
D.) Groundwater Elevations (Appendix A)

The data as presented in the July 22, 1996, is generally understandable. However, to fully understand the effectiveness of both the inceptor/recharge well system and the chromium treatment system, statistical evaluation of the data is necessary. This would be facilitated by receiving the data on disk.

Groundwater Surface Configuration/ Continuous Water-level Recorders

Agree with Kerr-Mcgee's interpretations as presented in these sections.

Interceptor System Performance

Agree with Kerr-Mcgee's interpretations about water levels as presented in this section.

1.) Total chromium-in-groundwater data are provided for wells M-71, M-73, M-84, M-84 (Table 1) and M-11, M-23, M-36, M-72, and M-86 (Table 3). Considering these tables, four questions arise:

A.) Are these all the chromium-in-groundwater data available for the interceptor/recharge well system? For example, are there hexavalent chromium data from these wells?

B.) Have the chromium analyses been performed by the same laboratory for the length of record presented in the submittal?

C.) What is the background (natural) concentration of total and hexavalent chromium in groundwater in areas upgradient of the facility?

2.) The letter states on page 3 that the M-80 series wells exhibit a leveling off or decline in chromium concentrations in the first half of 1996 (see Figure 7 also). This does appear to be true for well M-86 -- chromium concentrations have declined from 10.4 (Sept-95) to 2.50 milligram per liter (mg/L) (Jun-96).

However, chromium concentration in well M-84 has fluctuated considerably -- presently the "decline" in chromium appears to be based on only three data points - Feb-96, Mar-96, and Jun-96.

Chromium concentration in well M-88 are quite low throughout the record presented -- with the exception of a value of 1 mg/L (Jun-93) generally within two standard deviations of the mean of 0.62 mg/L. Therefore, a real decline appears only in M-86. Additional time-series data are needed to determine if the "declines" in M-84 and M-88 are real.

Chromium concentrations in groundwater samples from well M-88 and wells M-84 and M-86 differ by an order of magnitude. Well M-88 data should be graphed separately from wells M-84 and M-86.

Impact of Disposal Systems on Downgradient Water Levels

Agree with Kerr-Mcgee's interpretations concerning water levels as presented in this section.

Chromium Treatment System Effectiveness

1.) Interceptor Well Discharge Rates (Table 2) and Groundwater Chromium treatment Analysis (Table 4) -- there does not appear to be a correspondence between the amount of groundwater extracted (Table 2) and the amount of groundwater treated (Table 4). For example, when the June 1996 average(?) interceptor discharge rate of 36.8 gallons per minute (gpm) is multiplied by 7 days (that is 36.8 gpm x 1,440 minutes/day x 7 days/week), the system pumped approximately 371,000 gallons/week during June. Yet Table 4 indicates the June, 1996 weekly average treated volume was 426,000 (assuming "M" means 1,000) gallons. Is makeup water added to the system? Is there an error in the tables, or has the reviewer made a mistake or misinterpreted the tables?

2.) The submittal indicates average feed chromium concentration to the system January - June 1996 was 9.14 mg/L (Table 4). Is there data available to determine the concentration of hexavalent chromium? Speciation data of

influent groundwater may help Kerr-Mcgee and NDEP more effectively evaluate the effectiveness of the chromium removal system.

Recovery/Treatment System Effectiveness

No comments

Conclusions

Comments as noted above

Proposed Future Activities

Agree with Kerr-Mcgee's proposals in this section. Comments regarding additional work to be performed/data needs are noted above.

fax cover sheet

IT Las Vegas (commercial)

Phone: (702)222-0704

Fax: (702)222-3632

TO: Bob Kelso

From: Irene Mazza

No. Pages (with cover) 6

IT Corporation
4330 S. Valley View Ste 106
Las Vegas, Nevada 89106

Bob:

As a quick aside note – I had Syl review the Pioneer sampling rationale (Section 4.1). He has never heard of using acreage as a basis for number of samples and suggested that a reference be provided. We had previously requested this and the response was that the rationale was provided in the Work Plan. Perhaps rewording the comment and asking again would be appropriate. Also, there is no indication that they plan to evaluate the data for completeness (i.e., such as using SW-846 Equation 8) to determine if an adequate number of samples were collected.

As to KMCC, they state that there is no evidence that organics are used or disposed; therefore, they should not have to analyze for organics. They don't provide really much info except the statement that there is no evidence.... Is that adequate for you? Based on their processes, it looks reasonable, but seems a little weak. Also, Mike O'Hagan is reviewing the groundwater report (Attachment 24) for KMCC and will have comments no later than Monday. Note that in my LOU response comments, I put in some statements that KMCC should provide things to NDEP. I'm sure they intend to; I just put those in as flags so we'll remember to follow up on those items. (You may not need reminders, but I sure do!) Last, but not least, I really don't feel qualified to evaluate the air dispersion information provided in the LOU responses. I am trying to find someone in-house who can review it and tell me if it makes sense. If not, I'll find someone within the corporation. If I have to go outside of our office, I'll talk to you first and provide you with an estimate. I'm hoping to find someone here who can take an hour or so and review it for me.

I also looked at the fax you sent me from Seacor (October 23, 1996). The only comment I have on it is on Page 4, top of page. It is stated that DDE, DDT, and DDD were found in the soil samples. However, the recommendation states that target compounds were "below detectable levels." This discrepancy should be resolved.

Next step for me: look for the darn reference to the rad report, then take another lingering look at Pioneer. If I can't find the reference in the Phase II stuff that I have, then I'll go to Brenda's office and look in the Phase I's (or see if she wants to look). I'll also review the landfill info you sent and get it to Brenda. I also owe you a monthly report for October, which I'll get done by Friday. I'd like to wait to mail the KMCC comments to you until after you've looked at them. I'm between offices today (as usual). If you get voice mail at the 222-0704 number, try me at the 794-1717 number.

Terre

INTERNATIONAL TECHNOLOGY CORPORATION

October 30, 1996

Mr. Robert Kelso, P.E.
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Review of KMCC Work Plan and LOU Responses

Dear Mr. Kelso:

I have reviewed the Kerr-McGee Chemical Corporation (KMCC) Phase II Work Plan and Response to Letter of Understanding (LOU). My comments are enclosed.

If you have any questions regarding these comments, please call me at 702-794-1717. Thank you for this opportunity to be of service.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances.

Sincerely,
IT CORPORATION

Terre Maize

Terre Maize, C.E.M.
CEM#: EM-1030, Expires 11-96

COMMENTS ON KMCC PHASE II WORK PLAN
AND LOU RESPONSES
October 30, 1996

Work Plan

1. Page 2-1, Section 2.2.1, change EPA Method 8015 to EPA Method 8015 Modified (8015M). This change should be made throughout the text where this method is referenced.

2. Pages 2-2 and 2-3, Section 2.2.2. It should be noted that when results are received they will be statistically evaluated (such as through the use of SW-846 Equation 8 which uses the mean, regulatory threshold and standard deviation) to determine if the appropriate number of samples were collected and if the assumption of homogeneity is correct. While the number of samples proposed is probably adequate, a basis for the number selected should be provided (such as a reference to SW-846 or statistical methods).

3. Page 2-3, first full paragraph. What criteria will be used to determine if TCLP analyses should be conducted?

4. Page 2-3, last 2 paragraphs. There are typographical error in the text ("wereconstructed" in last full paragraph, "???" in last partial paragraph).

5. Page 2-4, Section 2.3.2, second paragraph. It is stated that samples will be "collected at a depth of 24-36 inches." Please provide the rationale for this sampling depth.

6. Page 2-5, Section 2.3.3. NDEP's previous comment asked for the rationale for sampling for nitrates. The LOU Response dated September 30, 1996, states that "a discussion of the well locations and sampling rationale is provided in the Work Plan." The Work Plan states "As specifically required in the LOU..." The fact that the LOU states that nitrates should be evaluated appears to be KMCC's sole rationale for sampling for nitrates. Whether other compounds should be analyzed is not addressed.

7. Pages 2-5 and 2-6, Section 2.3.4. NDEP's previous comment asking for the rationale for the sampling depth and limited analyses does not appear to have been adequately addressed. The revised Work Plan states that a previous manager was interviewed to help limit the suite of analytes. Additional information would also be helpful. For example, was there no evidence of staining or spillage? Is process knowledge adequate to indicate that organic compounds were not used in this area? What, specifically, are "inorganic type materials"? What is the rationale for the limited sampling depth? What about surface soil contamination?

8. Pages 2-7 and 2-8, Section 3.2.7. The previous comment by NDEP does not appear to have been adequately addressed. NDEP asked for a rationale for limiting analyses to metals and pH as truck washing and maintenance activities could indicate historical use

of solvents for cleaning and degreasing. This comment does not appear to be addressed by the plan.

9. Page 2-9, Section 2.3, last paragraph of section. The monitor well should also be analyzed for total petroleum hydrocarbons (TPH) for kerosene. In addition, the proposed analyses (semivolatiles, volatiles, pH, and specific conductance) will not detect the presence of arsenite or synthetic detergent and may not detect chlorinated paraffins. Additional analyses are recommended: metals (arsenic) and anionic, cationic, and nonionic detergent (depending on detergent type). Semivolatile organic compound analyses could detect chlorinated paraffins if the method is standardized against a standard chlorinated paraffin mixture.

11. Section 3. There is no reference to collection of duplicates, blanks, spikes, or other quality control samples (with the exception of 4 samples for field pH, temperature, and conductivity). Only equipment rinsate blanks and trip blanks are mentioned for groundwater samples. For aqueous samples, it is standard pracatice to collect duplicate samples. For volatile samples, it is standard practice to use a field blank. Commonly, one quality control sample is collected per 20 samples of each matrix or per sample group.

12. Page 3-11, Section 3.2.2.1, and Page 3-15, Section 3.3.2.1. It should be noted that samples collected for volatile organic compound analysis may not be composited.

LOU Responses

1. Page 13, LOU Item 15. It should be noted that the 1:10 dilution could have an effect on results if the initial undiluted response is beyond the linear range of the instrument. It could also have an effect on the detection limit.

2. Page 14, LOU Items 16 and 17. Why is chromium not sampled for in the monitor wells?

3. Page 15, LOU Items 16 and 17, second paragraph on page states that "installation of anew system ... has begun." What is the schedule for installation and implementation of this system?

4. Page 18, LOU Item 20. What is the schedule for submittal of this plan?

5. Page 30, LOU Item 47. It is stated that KMCC is unaware of studies of manganese effects on the local resident population. Are any planned? What steps were taken to locate information?

6. Page 34, LOU Item 56. Please provide the additional reference to NDEP when it is obtained.

7. Page 38, LOU Item 62. Please provide a copy of State Industries' response to NDEP.

8. Page 41, LOU Item 64. Please provide a copy of the TPH analyses to NDEP when they are available.

9. Page 42, LOU Item 68. Previously, it was stated that the lease for Nevada Recycling would be effective December 1996 and that the site would be cleaned upon lease termination. Previous reports indicate that soil contamination may be present. The September 30, 1996, KMCC response indicates that the lease has been renewed and that a sampling plan will be developed as the property is vacated; it is also stated that the property is likely to be occupied for a number of years into the future. How will soil contamination from spillage, etc., be addressed in the interim? Is it known that the contamination is not affecting groundwater? When is the sampling plan expected to be written and executed? What will be included in the "evaluation for cleanliness"?

ACCELERATED WORK TO ABATE, MITIGATE AND ELIMINATE ENVIRONMENTAL CONTAMINANTS IN THE GROUNDWATER EMANATING FROM THE BMI COMPLEX IN HENDERSON, NV

PROJECT WORK ORDER: Groundwater characterization

PURPOSE: The purpose of this work order is to provide a physical, chemical and radiological characterization of the groundwater flowing toward the Las Vegas Wash in the vicinity of the Pittman Lateral. This characterization is investigative in nauture and time is of the essence.

The last such characterization, albeit limited, was by the U.S. Environmental Protection Agency during the 1983/1984 timeframe. Results of sampling by Kerr-McGee Chemical LLC and others in this area is available. There are approximately 15 monitoring wells along the Pittman Lateral to be sampled and two monitoring wells along the Southern edge of the BMI Complex which may serve as background wells.

The plume(s) of interest contain organics, high-conductivity and perchlorate. The contaminants of interest in the groundwater include chromium, perchlorate, dissolved solids (salt), radionuclides, pesticides, organo-phosphates, organo-acids and benzene. The actual analytes are those expected to be introduced into the groundwater by the various liquid and solid waste management practices by the various companies that have and are operating at the BMI Complex. The field measurements of interest include pH and conductivity.

TIMEFRAME FOR PERFORMANCE: It is expected that a narrative and graphical report, containing data, analysis, summary and conclusions will be presented to NDEP no later than Monday, November 30, 1998 and a presentation will be made at a meeting of BMI companies in Las Vegas on Wednesday, December 2, 1998.

CONTRACTOR'S EXPERTISE: Technical expertise to be provided on this project includes an aqueous geochemist, a person with substantial expertise in contaminant fate and transport in groundwater, and a person with substantial experience in developing conceptual site models using US EPA's 1997 Directive and ASTM Standards.

NDEP POINT OF CONTACT: Thomas A. Whalen, P.E. in NDEP's Carson City Office (702)-687-4670 ext 3019.

TASKS: Some of the tasks on this project include a one day consultation to NDEP regarding the appropriate analytes and well data based upon a review of Phase I and Phase II submittals from the BMI Companies and discussion with the NDEP Point of Contact; contacting PEPCON & KMC LLC regarding use of their wells; mobilization, sampling and demobilization; submission of samples to appropriate laboratories for analysis including EPA's Las Vegas Lab for special perchlorate analysis; analytical data review and analysis; data summary; conclusions;

narrative report including appropriate graphics; and presentation to NDEP and at appropriate meetings of the BMI Companies.

POSSIBLE ANALYTES OF INTEREST

Stauffer/Pioneer

Benzene
Chloroform
Chlorobenzene
Dimethyldisulfide
Carbophenothion (Trithion)
Phosmet (Imidan)
Dimethylphosphorodithioic Acid (DMPT)
Diethylphosphorodithioic Acid (DEPT)
Monochlorobenzene Sulfonic Actid (MCBSA)
Benzene Sulfonic Acid
Phthalic Acid
Carbon Tetrachloride
Para-chlorobenzene sulfonicacid
Total Dissolved Solids
BHC - alpha isomer
BHC - delta isomer
BHC - gamma isomer (Lindane)
Phenol
Methylene Chloride
Hexachlorobenzene
Sodium hydroxide
Sodium hypochlorite
Iodine
Hydrochloric Acid
Phosphoric Acid
Thiol
Hydroxymethyl phthalimid
Iosheptane
Methanol
p-Chlorothiophenol
Thiolphenol
bis p-chlorophenyl sulfone
bis p-chlorophenyl disulfide
Phenyl sulfide
Phenyl disulfide
Phenyl sulfone
1,2 - dichlorobenzene
1,3 - dichlorobenzene

1,4 - dichlorobenzene
m- dichlorobenzene
p- dichlorobenzene
o- dichlorobenzene
trichlorobenzene
Chlorothioanisole
pp' DDE
op' DDT
pp' DDT

Kerr-McGee Chemical LLC

Nitrates
Chromium
Perchlorate
TDS

TIMET

Arsenic
Chromium (total)
Nitrate -nitrogen
Total Dissolved Solids
Manganese
Chloride
Sulfaate
Chloroform
Trichloroethene
Tetrachloroethene
Radium -226 & -228 in pCi/L
Beta emitters in mrems
Gross alpha in pCi/L
Radon in pCi/L
Uranium in micro grams/L and pCi/L

ANALYTICAL METHODS TO BE CONSIDERED

VOCs EPA 8260 + MTBE
Semi - vol 8270
Pesticides 8080
Aqueous TPH 8015M
Metals 6010
Perchloraate
Conductivity
Total Dissolved Solids -- Gross and trace chemistry to determine all the constituents

BTEX

MONITORING WELLS

From East to West along the Pittman Lateral

PC 10 KMC LLC -- contact Susan Crowley
PC 12 KMC
PC 17 KMC
MW K4 PEPCON -- contact Jeff Gibson
PC 18 KMC
PC 55 KMC
PC 19 KMC
L 635 The L series are old EPA wells, flush mount, 4" PVC, "in bad shape",
L 637 not maintained, full of silt and sediment, hard to find, Contact
L 639 Susan Crowley at KMC for location assistance.
L 641
L 645
L 651
L 653
MW Q (Twin) use shallow -- PEPCON

Background

BRW TIMET, no well construction log, contact Tony Garcia
H11 Stauffer/Pioneer, contact Chris Sylvia @ Pioneer

INTERNATIONAL
TECHNOLOGY
CORPORATION

October 30, 1996

Mr. Robert Kelso, P.E.
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

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Sincerely,
IT CORPORATION

Terre Maize

Terre Maize, C.E.M.
CEM#: EM-1030, Expires 11-96

Regional Office
4330 South Valley View, Suite 114 • Las Vegas, Nevada 89103-4047 • 702-794-1700

COMMENTS ON KMCC PHASE II WORK PLAN
AND LOU RESPONSES
October 30, 1996

Overall Comment:
The LOU requests that the limited suite of analytes (primarily metals and pH) be justified. The Work Plan and LOU Responses state that KMCC has no knowledge of disposal of organic compounds in the various locations. This statement needs additional documentation and backup. While the statement is not disputed, additional justification, such as references to process knowledge, should be provided. It is understood that organic compounds were not used as part of the processes; however, the use of products, such as chlorinated solvents and degreasers, was ubiquitous throughout the period of operation. There have also been statements in the Phase I report and Phase II Work Plan that knowledge of dumped constituents is limited. Therefore, it may be prudent to collect a few samples for analysis of organic compounds, if only to prove their absence.

Work Plan

1. Page 2-1, Section 2.2.1, change EPA Method 8015 to EPA Method 8015 Modified (8015M). This change should be made throughout the text where this method is referenced.

2. Pages 2-2 and 2-3, Section 2.2.2. It should be noted that when results are received they will be statistically evaluated (such as through the use of SW-846 Equation 8 which uses the mean, regulatory threshold and standard deviation) to determine if the appropriate number of samples were collected and if the assumption of homogeneity is correct. While the number of samples proposed is probably adequate, a basis for the number selected should be provided (such as a reference to SW-846 or statistical methods).

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9. Page 2-8, Section 2.3.8. Were any subsequent tests performed to determine that the staining was due only to waste oil and not to spilled 1,1,1-TCA? If not, it may be prudent to collect a sample to determine if 1,1,1-TCA is present.

10. Page 2-9, Section 2.3.10, last paragraph of section. The monitor well should also be analyzed for total petroleum hydrocarbons (TPH) for kerosene. In addition, the proposed analyses (semivolatiles, volatiles, pH, and specific conductance) will not detect the presence of arsenite or synthetic detergent and may not detect chlorinated paraffins. Additional analyses are recommended: metals (arsenic) and anionic, cationic, and nonionic detergent (depending on detergent type). Semivolatile organic compound analyses could detect chlorinated paraffins if the method is standardized against a standard chlorinated paraffin mixture.

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8. Page 41, LOU Item 64. Please provide a copy of the TPH analyses to NDEP when they are available. Rec'd 4 Feb 22

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

October 2, 1996

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Phase II Written Response to Letter of Understanding

Dear Mr. Kelso:

Kerr-McGee Chemical Corporation (KMCC) signed a Consent Agreement with Nevada Division of Environmental Protection (NDEP) earlier in 1996, establishing the process for proceeding with Phase II of an Environmental Conditions Assessment. As required in this Agreement, a Phase II Work Plan was developed and submitted to NDEP which described field activities designed to fill in data gaps identified in the Phase I activities. Concurrent with submission of the Phase II Work Plan was submission of a Written Response which addressed those data gaps which did not require field work.

In July 1996, NDEP provided comments on both the Work Plan and Written Response for inclusion in the final version of the respective documents. Attached with this correspondence is the revised Written Response inclusive of the NDEP comments and KMCC response to the NDEP comments. Two copies have been sent to the Las Vegas NDEP location, to the attention of Brenda Pohlmann. Submission of the revised Work Plan will follow this correspondence in several weeks.

Feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM-1428
Staff Environmental Specialist

smc\PHIIWRCL.WPD
cc: Brenda Pohlmann (NDEP)
PRDemps
RHJones
RANapier
TWReed
JTSmith (Covington & Burling)
RSimon (ENSR)
Verrill Norwood (Pioneer)
Joel Mack (Montrose)
Susan Stewart (TIMET)
Greg Schlink (BMI)
PSCorbett

Kent Stevenson (Pioneer) - w/o attachment
Lee Erickson (Stauffer) "
Mike Reilly (Zeneca) "
Barry Sandles (Morrison & Foerster - TIMET)
David Tundermann (Parsons, Behle & Latimer - BMI)

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
Carson City, Nevada 89710

September 20, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Phase II Consent Agreement - Signature Copy

Dear Ms. Crowley:

Enclosed for your records is the original signature version of the Phase II Consent Agreement between Kerr-McGee Chemical Corporation (KMCC) and the Division concerning further activities at the KMCC Facility in Henderson, Nevada. Attachments A and B are included. Your prompt attention to providing Attachment C is greatly appreciated.

This letter also serves as notification by the Division that the undersigned is designated as the Division Project Coordinator per Section XXIII of the Consent Agreement. Mr. Doug Zimmerman will act as Project Coordinator during any absences.

Please do not hesitate to contact me or Doug Zimmerman at (702) 687-4670, extension 3020 and 3127, respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

cc: D. Zimmerman, NDEP
W. Frey, DAG

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

August 29, 1996

Mr. Doug Zimmerman
Chief, Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Zimmerman:

Subject: KMCC Phase II

Kerr-McGee Chemical Corporation signed a Consent Agreement with NDEP in August 1996, establishing the process for proceeding with Phase II of an Environmental Conditions Assessment. As required in this Agreement, this correspondence is to confirm the Kerr-McGee Project Manager as myself, Susan M. Crowley. In addition, the following will be key project personnel:

TABLE 1
Key Personnel

TITLE	COMPANY - LOCATION	NAME, PHONE
KMCC Project Manager	KMCC - Henderson, NV	Susan Crowley, 702/651-2234
ENSR Project Manager	ENSR - Camarilo, CA	Rick Simon, 805/388-3775
ENSR Asst Project Manager	ENSR - Camarillo, CA	Harold van Deinse, 805/388-3775
Site Health & Safety Officer	KMCC - Henderson, NV	Greg B. Cowley, 702/651-2228
Nevada Certified Environmental Manager	ENSR - Camarillo, CA	David Gerry, CEM # Pending 805/388-3775
KMCC Project Hydrologist	KM - Oklahoma City, OK Corporate Office	Tom W. Reed, 405/270-2654
Laboratory Contact	LOCKHEED - Las Vegas, NV	Mary Ford, 702/361-1626

Feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM-1428
Staff Environmental Specialist

By certified mail
cc: PSCorbett, PRDemps, RHJones, RANapier

SMC\PHIIPER.WPD

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

August 29, 1996

Mr. Doug Zimmerman
Chief, Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Zimmerman:

Subject: KMCC Phase II

Kerr-McGee Chemical Corporation signed a Consent Agreement with NDEP in August 1996, establishing the process for proceeding with Phase II of an Environmental Conditions Assessment. As required in this Agreement, this correspondence is to confirm the Kerr-McGee Project Manager as myself, Susan M. Crowley. In addition, the following will be key project personnel:

TABLE 1
Key Personnel

TITLE	COMPANY - LOCATION	NAME, PHONE
KMCC Project Manager	KMCC - Henderson, NV	Susan Crowley, 702/651-2234
ENSR Project Manager	ENSR - Camarilo, CA	Rick Simon, 805/388-3775
ENSR Asst Project Manager	ENSR - Camarillo, CA	Harold van Deinse, 805/388-3775
Site Health & Safety Officer	KMCC - Henderson, NV	Greg B. Cowley, 702/651-2228
Nevada Certified Environmental Manager	ENSR - Camarillo, CA	David Gerry, CEM # Pending 805/388-3775
KMCC Project Hydrologist	KM - Oklahoma City, OK Corporate Office	Tom W. Reed, 405/270-2654
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Feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Sincerely,

Susan M. Crowley, CEM-1428
Staff Environmental Specialist

By certified mail
cc: PSCorbett, PRDemps, RHJones, RANapier

SMC\PHIIPER.WPD

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

August 16, 1996

Mr. Paul Lohman
Nevada Department of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: Modification of Permit NV0000078 - Well Sampling Elimination

Dear Mr. Lohman:

Kerr-McGee Chemical Corporation (KMCC) maintains ponds on site for management of process solutions. These ponds all contain aqueous non-hazardous solutions and are regulated in the NPDES program under the authority of the Nevada Department of Environmental Protection.

While we recognize the efficiency ponds provide for managing and concentrating process solutions, we also recognize the risk ponds may pose to the environment in the event of a breach of the lining system. Towards minimizing this risk, it has been KMCC's goal to eliminate all single-lined ponds from service. Single-lined ponds were either decommissioned with flows redirected to alternative equipment for handling the process solutions, **or** ponds were decommissioned with flows redirected to a double-lined pond.

Ponds AP-2 and C-1 were the last of these single-lined ponds to be decommissioned. C-1 pond was decommissioned in late 1995, and the flow (steam plant blow down) was expected to be redirected to a newly built, double-lined C-1. Until the new C-1 was built, the flow was temporarily redirected to WC-2, a double-lined pond. Because our NPDES Permit was in the renewal process, changes were made to the Permit to reflect the new C-1 existence as a double-lined pond even though the pond had not yet been built. This was done because pond construction was imminent. NDEP and KMCC believed the pond would be complete and in service by the end of the Permit's comment period. However, after a construction delay due to the difficulty in C-1 solids evaporation, and after considerable engineering effort to reduce the steam plant effluent volume, KMCC was able to accommodate the old C-1 flows in WC-2 on a permanent basis. A decision was made to not build the new C-1, and the construction materials were returned to the manufacturer. Decommissioning of old C-1 was discussed in the first, second, and third quarter 1995 DMR's submitted to Shannon Bell, NDEP. The final disposition of the solids and liner was discussed in the third quarter 1995 DMR. Yet to be completed for the decommissioned C-1 pond is a Sampling Plan which will provide information for a clean closure of the non-hazardous C-1 pond area.

Single-lined pond AP-2 was decommissioned in the fourth quarter 1995. Flow which had gone to this pond was redirected to double-lined AP-1 pond. AP-2 pond's accumulated solids were transferred to double-lined AP-6 for later product value recovery. The liner was washed and allowed to dry. It was tested and subsequently disposed of at the non-hazardous Apex Industrial landfill. A description of these activities was provided in the fourth quarter 1995 DMR submitted to Shannon Bell, NDEP. A Sampling Plan will be prepared for AP-2 which will provide information for clean closure of the non-hazardous AP-2 pond area.

In March 1996, KMCC submitted a request to Leo Drozdof, NDEP, for modification of KMCC Henderson's NPDES Permit #0000078. KMCC requested that the Permit be modified: 1) to eliminate double lined C-1 pond from the pond list, because new C-1 was not built, and 2) to eliminate the sampling requirement for wells which historically monitored the single lined AP-2, because AP-2 was no longer in existence. Subsequent information was sent to Mr. Drozdof in April 1996, which included plots of the constituents monitored in the AP-2 wells. Attached to this correspondence are the AP-2 well descriptions as well as a map to indicate where these wells are located.

KMCC appreciates your attention in this matter. We are interested in our Permit reflecting conditions within the plant as accurately as possible. Please feel free to call me at (702) 651-2234 if you have any questions or need additional information.

Sincerely,

Kerr-McGee Chemical Corporation

Susan M. Crowley
Staff Environmental Specialist

Attachments

cc: PSCorbett
MJPorterfield
RANapier
TWReed
Shannon Bell, NDEP

SMC\AP2WELLS.WPD

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

August 16, 1996

Patrick Corbett
Plant Manager
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009

Subject: Modification of NPDES Permit NV0000078

Dear Mr. Corbett:

The purpose of this letter is to respond to Kerr-McGee Chemical Corporation's (KMCC) request to modify NPDES permit NV0000078. KMCC has requested a permit modification to reflect the removal from service of surface impoundment AP-2 and KMCC' decision not to build surface impoundment C-1. This request was presented to the Nevada Division of Environmental Protection (NDEP) by KMCC in two letters dated March 25 and April 8, 1996.

After reviewing the permit and historical groundwater data collected from monitor wells M-17, 25, and 89 and the information supplied by KMCC in the aforementioned letters, NDEP will modify the existing permit such that:

- Pond C-1 listed in section I.A.4 and mentioned in the March 25, 1996 letter will be removed from the permit to acknowledge that it does not exist.

- The sampling frequency of monitoring wells M-17, M-25, and M-89 as presented in section I.A.7.2 of the current permit will change from monthly to quarterly.

Additionally, NDEP reviewed available files concerning the AP ponds and found no evidence that wells M-17, 25, and 89 were installed for the express purpose of detecting a potential leak from AP-2. However, the monitoring and reporting schedule for these wells as required under this permit may change following an assessment of the data to be presented in the AP-2 closure report.

The aforementioned modifications to permit NV0000078 shall become effective immediately. If you have any questions regarding this information please do not hesitate to call me at (702) 687 - 5836 ext. 3141.

Sincerely yours,

Paul R. Lohman
Staff II, Associate Engineer

cc: Bob Kelso, P.E. - Corrective Actions
Shannon Bell - Water Pollution Control

Printed by Bob Kelso 8/ /96 3:58pm

From: Paul Lohman
To: Bob Kelso
Subject: Kerr McGee Surface Impoundment

====NOTE========== 8/19/96 3:33pm==========

On Tuesday august 13, I called Susan Crowley at KMCC regarding thier request to modify there existing NPDES permit. One of the modifications they requested was recognition in their permit that pond C-1 no longer existed.

At the time the permit was renewed, KMCC planned to build a double lined pond called C-1. This pond was to replace a single lined pond at the same location which had been decommisioned earlier. dd C1 → Single lined

I asked what the condition of the pond was when it was decommisioned. She said a tear was observed in the liner but they were not sure if it was a result of removal activities or something else. I also asked if they planned to provide a closure plan and report associated with the pond decommisioning. She said no since no monitoring wells were associated with the pond.

She said a white precipitate forms at the former pond location when any ground moisture evaporates.

KERR-McGEE
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

August 15, 1996

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

Dear Ms. Bell:

SUBJECT: Henderson Facility - NPDES #NV0000078

This report is required by and prepared specifically for the State of Nevada DEP. It presents the observed results of measurements required to be performed by the State of Nevada DEP. It is not intended as an assertion of the accuracy of any instrument, readings, or analytical results, nor is it an endorsement of the suitability of any analytical measurement procedure.

KMCC maintains lined ponds to manage some aqueous process solution at the Henderson facility. All current ponds are double lined. One of the older closed ponds, AP-2 (a single lined pond), had associated groundwater monitoring wells that were sampled to document no leakage from the pond. This sampling requirement was included in the facility NPDES Permit #0000078. This pond has been closed, and a request to modify the Henderson Permit #0000078 to eliminate the wells sampling requirement has been submitted to NDEP. While the Permit requires annual reporting of the analytical information related to this closed pond to NDEP, this information is being supplied now and will be supplied quarterly, at your request, until the permit modification is made.

Attached in Table 1 is information related to groundwater wells M-17 (upgradient), M-89 and M-25.

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

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Attachment
cc: PSCorbett
RANapier
MJPorterfield
FRStater
WKTaylor

SMC\NPDESGW.WPD

Table 1. AP-2 Groundwater Wells - Analytical Data

Date	Well #	Depth to Water	pH	Sp Cond (umhos)	NaCl (g/l)	NH_4ClO_4 (g/l)
1/96	M-17	33.70	7.1	15,330	3.4	0.04
	M-89	32.45	7.1	15,280	3.7	0.16
	M-25	33.00	7.3	11,730	3.3	0.14
2/96	M-17	33.90	7.2	17,230	3.5	0.05
	M-89	32.50	7.1	16,600	3.4	0.15
	M-25	33.10	7.5	13,720	3.3	0.07
3/96	M-17	33.80	7.2	17,300	3.5	0.05
	M-89	32.90	7.2	16,150	3.4	0.14
	M-25	32.30	7.3	12,470	3.3	0.08
4/96	M-17	34.10	7.1	16,350	3.5	0.04
	M-89	32.75	7.1	15,080	3.3	0.16
	M-25	33.20	7.2	12,010	3.2	0.16
5/96	M-17	34.15	7.2	14,960	3.5	0.08
	M-89	32.75	7.2	13,650	3.2	0.16
	M-25	33.30	7.2	11,310	3.2	0.16
6/96	M-17	34.30	7.2	15,030	3.5	0.07
	M-89	32.85	7.2	13,370	3.3	0.16
	M-25	33.30	7.3	11,030	3.2	0.16

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

STATE OF NEVADA
BOB MILLER
Governor

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

* * * * FAX COVER SHEET * * * *

DATE: 8/1/96

TO: Pat Dorrs
KMCC

FAX NUMBER: (505) 270-4101

FROM: Bob Kelso
NDOP

SUBJECT/COMMENTS: Change pages to Ø1 Consent Agree - Henderson, NV. Facility (Pages 1, 3, 50, 51)

NUMBER OF PAGES INCLUDING COVER PAGE: 5

IF YOU HAVE ANY QUESTIONS, PLEASE CALL:
(702) 687-4670 x 3020

(702) 687-

DRAFT

NDEP Comments to KMCC Phase II Submittal

Response to Letter of Understanding

1. LOU Item #1 - Attachment 1 provides the analytical data from DataChem for three (3) samples "in the vicinity" of WC-1 and WC-2. Please provide specific sample locations and indicate same on appropriate Figures.

2. LOU Item #3 - Please explain the comment regarding modifications to the April 1993 ECA Report. No change pages are provided with this submittal and the 1993 report appears unchanged.

3. LOU Item #4 - What were the activities and/or products of the additional tenants listed in KMCC's response, i.e., Ruth Mitchell; Nevada Clay Products Company; Allied Productions, Inc.; and U.S.Vanadium? Assuming Hardesty/Amecco did operate and produce chemical products, what is the most probable method and location of waste disposal and transport? How does KMCC propose to verify that none of these residual wastes remain on site?

4. LOU Item #6 - The Division has received and reviewed analytical results of the City of Henderson's sampling along the proposed Warm Springs Road Extension from Gibson to Eastgate Roads. We have not seen analytical results for the remaining section from Eastgate to Boulder Highway. This information will be forwarded to KMCC on receipt. Regarding KMCC's previous sampling data, please provide the locations of each sample and the rationale for excluding the 1-4 feet below ground surface sampling interval.

5. LOU Item #11 - Due to the difficulty involved in obtaining confirmatory samples from the "old drying pad" area, they are not required at the current time. The Division may require these samples, including Chromium VI, on facility decommissioning or pad removal/replacement.

6. LOU Item # 14 - Attachment 7 has been reviewed by the Bureau of Waste Management personnel as summarized in enclosed memo from J. Denison, dated June 13, 1996. Based on the information in Attachment 7, chromium does not appear to be a concern, however, one must question how the liquid waste stream entering the impoundment failed the EP Tox test (per the Phase I documentation), and the evaporated solids and soils managed to pass. Any additional information you have on this occurrence would be very enlightening.

7. LOU #16 & #17 - The requested summary diagram/facility map shows all AP impoundments and waste management units/areas except the on-site Hazardous Waste Landfill. Please include the landfill location on the appropriate drawing or drawings.

8. LOU #28 - Please provide additional detail regarding hydrocarbon removal at the hazardous waste storage area, i.e., volume of material removed, location of samples, disposal receipts, etc. Also what were the "elevated levels of TPH" shown by soil testing and what other materials were analyzed for?

9. LOU # 39 - Provide a schedule for the additional soil removal, analysis and reporting. What are the elevated TPH levels still present and the extent of the contamination? This Item may be more appropriate to the Workplan for ease of management and tracking.

10. LOU #41 - See Comment 9 above for LOU #39.

11. LOU #43 - The Division is unable to locate the referenced document (Groundwater Interception System Evaluation Report, Henderson, Nevada Facility) prepared by the Kerr-McGee Hydrology Department. Please provide a copy for review and evaluation in response to the request of LOU #43. Additional KMCC effort may be required based on the results of this review.

12. LOU #56 - Additional clarification of this response is required. For example, does "initial treatment" refer to application of AP to the soil or application of a methodology to remove/reduce it? If the later, it appears to have been a failure. Also, since the referenced reports are over 20 years old and the literature search was brief, is anyone actively investigating AP environmental impacts at the current time. I understand that an AP working group, composed of producers and users, is also concerned about this issue. Is any information available from this group?

13. LOU #59 - The LOU requests a list of analytes "...currently monitored for and the latest data." Please provide this information along with the locations at which the samples were taken.

14. LOU #60 - What is the status of the acid drains in the non-operating portion of the plant? What material/contaminants can get into these drains and be distributed throughout the system? What techniques have been employed to verify the integrity of this system? What does KMCC plan to do with the unplugged portion?

15. LOU #63 - Please provide a copy of the final report and the closure letter from Clark County regarding the June 1991 tank removal at the J.B. Kelley Site.

16. LOU # 64 through 67 - Page 26 is missing from this document. Please provide this page and the responses to the referenced LOU's.

17. LOU # 68 - KMCC's response indicates other "visits" to the Nevada Recycling Corporation site since September 1993. What was the outcome of these visits? Provide copies of any reports and subsequent correspondence. How does KMCC intend to verify site cleanliness after lease termination? Include this as a discussion item in the workplan.

Phase II Workplan

18. Section 2.2.2 (Sampling) - Provide the statistical bases for the number of samples to be collected in each area, i.e., include the SW-846 calculations for the stratified random sampling method. why was this particular methodology selected?

19. Section 2.3.1 (Trade Effluent Ponds/LOU #1 & #2) - What is the rationale for selected sample depths of 0-1, 4-5 and 9-10 feet below ground surface? The borings made prior to construction of WC-1 and WC-2 indicate depths of 15-16 feet. How do the locations of the new borings relate to the location of the WC-1 and WC-2 borings?

20. Section 2.3.3 (AP Ponds/LOU #16 & #17) - Provide the rationale for analyzing for nitrates in wells M-17, M-89 and M-25. What waste products are present in the ponds from the AP process?

21. Section 2.3.4 (Truck Unloading Area/LOU #35) - Provide the rationale for a sampling depth of 24-36 inches and the limited analyses for total metals and pH. KMCC's Phase I Report states "unknown" contamination in this area. What new information is available to better define the wastes now?

22. Section 2.3.6 (Change House/Lab Septic Tank - LOU #54) Semi-volatile organic compounds (SVOC's) are typically used in laboratory processes along with volatile organics for preparing standards, solutions, and titrants. Why are analyses for SVOC's excluded?

23. Section 2.3.7 (J.B. Kelley/LOU #63) - Again, provide rationale for limiting analyses to metals and pH. Truck washing and maintenance activities could indicate the historical use of solvents for cleaning and degreasing.

PETER G. MORROS, Director
L.H. DODGION, *Administrator*
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

July 10, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Comments to the KMCC Phase II Work Plan and Response to Letter of Understanding - NDEP and the City of Henderson

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has completed its review of the referenced Phase II documents and provides the attached comments for inclusion in the final version. These comments include those of the City of Henderson and represent the consolidated comments of known interested parties.

In addition, the Division considers both documents, the Draft LOU Response and the Draft Workplan, to constitute the deliverable "Workplan" referenced in the Phase II Consent Agreement. The cross-referencing between the two documents functionally makes them a single workplan.

Please do not hesitate to contact me or Doug Zimmerman at (702) 687-4670, extension 3020 and 3127, respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

cc: D. Zimmerman, NDEP
W. Frey, NDAG
Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

NDEP Comments to KMCC Phase II Submittal

Response to Letter of Understanding

General - Plates 1-3 show data that is approximately 3 years old. What changes have occurred in that time? Please update with current data.

1. LOU Item #1 - Attachment 1 provides the analytical data from DataChem for three (3) samples "in the vicinity" of WC-1 and WC-2. Please provide specific sample locations and indicate same on appropriate Figures.

2. LOU Item #3 - Please explain the comment regarding modifications to the April 1993 ECA Report. No change pages are provided with this submittal and the 19932 report appears unchanged. Also, provide additional justification/rationale for the statement that manganese dioxide "...represents the majority of emissions...considered to be 'depositional.'" How does this compare to current and historical dispersion and deposition?

3. LOU Item #4 - What were the activities and/or products of the additional tenants listed in KMCC's response, i.e., Ruth Mitchell; Nevada Clay Products Company; Allied Productions, Inc.; and U.S.Vanadium? Assuming Hardesty/Amecco did operate and produce chemical products, what is the most probable method and location of waste disposal and transport? How does KMCC propose to verify that none of these residual wastes remain on site?

4. LOU Item #6 - The Division has received and reviewed analytical results of the City of Henderson's sampling along the proposed Warm Springs Road Extension from Gibson to Eastgate Roads. We have not seen analytical results for the remaining section from Eastgate to Boulder Highway. This information will be forwarded to KMCC on receipt. Regarding KMCC's previous sampling data, please provide the locations of each sample and the rationale for excluding the 1-4 feet below ground surface sampling interval.

5. LOU Item #8 - This LOU item requested "additional information on the...regulatory/closure status and release history..." of Pond P-3, which does not appear to have been discussed in the Phase I Report. Provide the specific characteristics of the waste managed therein, the sampling criteria used to determine the extent of underlying soil removal at "closure", and the location and analytical results from such samples.

6. LOU Item #11 - Due to the difficulty involved in obtaining confirmatory samples from the "old drying pad" area, they are not required at the current time. The Division may require these samples, including Chromium VI, on facility decommissioning or pad removal/replacement.

7. LOU Item # 14 - Attachment 7 has been reviewed by the Bureau of Waste Management personnel as summarized in enclosed memo form J. Dennison, dated June 13, 1996. Based on the information in Attachment 7, chromium does not appear to be a concern, however, one must question how the liquid waste stream entering the impoundment failed the EP Tox test (per the Phase I documentation), and the evaporated solids and soils managed to pass. Any additional information you have on this occurrence would be very enlightening. Again, the issue is not chromium, but any contaminant in the disposed waste is above state action levels.

8. LOU Item #15 - Additional information is needed regarding the status and removal of the Platinum Drying Unit. Attachment 8 shows TCLP analysis data indicating analysis dates during January 1993. The chain of custody forms appear to indicate sampling dates in April 1994. Please reconcile these dates and provide sample locations and analytical data for both test sequences. Also, the LOU response text (page 7) indicates soils were collected and analyzed from under the pad while Attachment 8 indicates samples from beside the pad. Please explain. What is the difference between "#1N" and "#2S" on the chain of custody form in Attachment 8? Explain the implications on the detected chromium concentrations due to the 1:10 dilution to reduce acetate matrix interference.

9. LOU Items #16 & #17 - The requested summary diagram/facility map shows all AP impoundments and waste management units/areas except the on-site Hazardous Waste Landfill. Please include the landfill location on the appropriate drawing or drawings. Also, provide additional data regarding the decommissioning of Pond AP-2, e.g. sampling data showing that soil contaminated at levels of concern was removed, sampling locations, etc.

10. LOU Item #20 - Provide additional data regarding the decommissioning of Pond C-1, e.g. sampling data showing that soil contaminated at levels of concern was removed, sampling locations, etc.

11. LOU Items #24 and #34 - The LOU requests specific information regarding the potential impact of manganese on the groundwater from the areas. Provide additional, manganese specific, data or an explanation relating the non-manganese data from Attachment 10 to the potential manganese impact.

12. LOU Item #28 - Please provide additional detail regarding closure and hydrocarbon removal at the hazardous waste storage area, i.e., volume of material removed, location of samples, disposal receipts, etc. Also what were the "elevated levels of TPH" shown by soil testing and what other materials were analyzed for?

13. LOU Item #39 - Provide a schedule for the additional soil removal, analysis and reporting. What are the elevated TPH levels still present and the extent of the contamination? This Item may

be more appropriate to the Workplan for ease of management and tracking.

14. LOU Item #41 - See Comment 9 above for LOU #39.

15. LOU Item #43 - The Division will review and evaluate the referenced document (Groundwater Interception System Evaluation Report, Henderson, Nevada Facility) prepared by the Kerr-McGee Hydrology Department in response to the "stand alone document" request of LOU #43. Additional KMCC effort may be required based on the results of this review, including further characterization of contamination in the vadose zone beneath Units 4 & 5.

16. LOU Item #43 - Has KMCC evaluated the effects of manganese exposure to off-site residents at other facilities? If so, what results were obtained, what conclusions were drawn, and what changes/modifications to processes, etc. were made in response to these results and conclusions? What industrial hygiene studies are available and/or have been reviewed by KMCC concerning manganese effects on the local resident population?

17. LOU Item #56 - Additional clarification of this response is required. For example, does "initial treatment" refer to application of AP to the soil or application of a methodology to remove/reduce it? If the later, it appears to have been a failure. Also, since the referenced reports (please provide the Division with copies) are over 20 years old and the literature search was brief, is anyone actively investigating AP environmental impacts at the current time. I understand that an AP working group, composed of producers and users, is also concerned about this issue. Is any information available from this group?

18. LOU Item #59 - The LOU requests a list of analytes "...currently monitored for and the latest data." Please provide this information along with the locations at which any samples were taken. This response also only addresses groundwater contamination. What soil sampling has been conducted around the storm sewer system to ensure that no leakage has occurred? Mr. Gaddy's letter makes reference to small flows in the system from upgradient source water leaks. If water can get into the system, contamination has the potential to get out.

19. LOU Item #60 - What is the status of the acid drains in the non-operating portion of the plant? What material/contaminants can get into these drains and be distributed throughout the system? What techniques have been employed to verify the integrity of this system? What soil sampling has been conducted around the acid drain system to ensure that no leakage has occurred. What does KMCC plan to do with the unplugged portion?

20. LOU Item #62 - Attachment 16 (Subsurface Soil Evaluation, Former Evaporation Pond Sites, Former State Industries Facility) will require additional evaluation by the Division to determine if additional information is required. Areas of potential concern

include closure requirements/documentation for the former evaporation ponds, regulatory status, and other historical uses. There also appear to be several factual inconsistencies between Attachment 16 and the KMCC Phase I Report, including differences with respect to the type of pond liner and the physical size of the ponds. These inconsistencies must be resolved to the satisfaction of the Division.

21. LOU Item #63 - Please provide a copy of the final report and the closure letter from Clark County regarding the June 1991 tank removal at the J.B. Kelley Site. Completion of the two borings (MW-92 and MW-93) indicates an intent to continue sampling for some period of time into the future. Attachment 17 only includes analytical data from the initial sampling round. What additional data is available? Please provide a copy to the Division.

22. LOU Items #64 through #67 - Page 26 is missing from this document. Please provide this page and the responses to the referenced LOU's.

23. LOU Item #68 - KMCC's response indicates other "visits" to the Nevada Recycling Corporation site since September 1993. What was the outcome of these visits? Provide copies of any reports and subsequent correspondence. How does KMCC intend to verify site cleanliness after lease termination? Include this as a discussion item in the workplan.

Phase II Workplan

24. Section 2.2.2 (Sampling) - Provide the statistical bases for the number of samples to be collected in each area, i.e., include the SW-846 calculations for the stratified random sampling method. Why was this particular methodology selected? Also, provide the rationale for analyte selection in each area, i.e. metals and pH in the Trade Effluent Ponds and nitrates in the monitoring wells around the AP Ponds.

25. Section 2.3.1 (Trade Effluent Ponds/LOU #1 & #2) - What is the rationale for selected sample depths of 0-1, 4-5 and 9-10 feet below ground surface? The borings made prior to construction of WC-1 and WC-2 indicate depths of 15-16 feet. How do the locations of the new borings relate to the location of the WC-1 and WC-2 borings? Provide the rationale for limiting sampling to only metals and pH.

26. Section 2.3.2 (Old P-2, P-3 Ponds/LOU #7 & #8) - The text states sampling for total metals and pH. Table 2 (page 2-9) indicates chromium and pH. Which is correct? Provide the rationale for this analyte selection.

27. Section 2.3.3 (AP Ponds/LOU #16 & #17) - Provide the rationale for analyzing for nitrates in wells M-17, M-89 and M-25. What waste products are present in the ponds from the AP process?

28. Section 2.3.4 (Truck Unloading Area/LOU #35) - Provide the rationale for a sampling depth of 24-36 inches and the limited analyses for total metals and pH. KMCC's Phase I Report states "unknown" contamination in this area. What new information is available to better define the wastes now?

29. Section 2.3.6 (Change House/Lab Septic Tank - LOU #54) Semi-volatile organic compounds (SVOC's) are typically used in laboratory processes along with volatile organics for preparing standards, solutions, and titrants. Why are analyses for SVOC's excluded?

30. Section 2.3.7 (J.B. Kelley/LOU #63) - Again, provide rationale for limiting analyses to metals and pH. Truck washing and maintenance activities could indicate the historical use of solvents for cleaning and degreasing.

L. H. DODGION
Administrator

Administration:
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BOB MILLER
Governor

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Director

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Waste Management
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

* * * * FAX COVER SHEET * * * *

DATE: 7/10/96

TO: Susan Crowley
KMCC

FAX NUMBER: (702) 651-2310

FROM: Bob Kerr
NDEP

SUBJECT/COMMENTS: Final Comments to Draft Workplan. Original to follow by U.S. Mail. Call if you have any questions

Bob

NUMBER OF PAGES INCLUDING COVER PAGE: 7

IF YOU HAVE ANY QUESTIONS, PLEASE CALL:
(702) 687-4670 x3020

(O)-1991

(702) 687-

Hazardous Waste Disposal Law program by NAC § 444.8632, after January 26, 1983.

2. With respect to each Study Item which also is a Subject Unit that was closed by removal or decontamination, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1, such tasks as are necessary to demonstrate that the closure met the standards for closure by removal or decontamination in 40 C.F.R. §§ 264.228, 264.280(e), or 264.258, as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

3. With respect to each Study Item which also is a Subject Unit that was not closed by removal or decontamination in accordance with the standard specified in the preceding Paragraph 2, the Company shall include in the Environmental Conditions Workplan required by Section IV.A.1 such tasks as are necessary to develop the groundwater monitoring and hazardous constituent release characterization information specified in Subpart F of 40 C.F.R. Part 264 and 40 C.F.R. § 270.14(c), as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

XVII. REIMBURSEMENT OF DIVISION OVERSIGHT COSTS

1. Following the Effective Date and for the effective period of this Consent Agreement, the Company shall reimburse the Division for costs reasonably incurred for oversight of this Consent Agreement in the manner prescribed by Section XVII (Reimbursement of Division Oversight Costs) of such BMI Common Areas Phase 2 Consent Agreement.

2. In the event that the BMI Companies fail to comply with Section XVII (Reimbursement of Division Oversight Costs) of the BMI Common Areas Phase 2 Consent Agreement, then the Company shall be obligated to reimburse the Division for any unpaid oversight costs and expenses as described in Paragraph 1 of said Section XVII that are: (i) not the subject of dispute resolution proceedings under Section XV of the BMI Common Areas Phase 2 Consent Agreement; and (ii) attributed to the Company or the Company's Site in an invoice submitted to the BMI Companies by the Division as required by Paragraph 2 of Section XVII of the BMI Common Areas Phase 2 Consent Agreement. Amounts due hereunder shall be paid by the Company within thirty (30) days after receipt by the Company of written notice from the Division indicating the amount owing.

3. In the event that the BMI Common Areas Phase 2 Consent Agreement terminates for any reason before this Consent Agreement terminates in accordance with Section XXX (Termination) hereof, the Company shall be obligated hereunder to reimburse the Division for oversight costs and expenses as described in

Paragraph 1 of Section XVII (Reimbursement of Division Oversight Costs) of such BMI Common Areas Phase 2 Consent Agreement that are incurred by the Division in the ongoing administration of this Consent Agreement. The Division shall submit to the Company a monthly invoice, commencing with the first full calendar month after the termination of the BMI Common Areas Phase 2 Consent Agreement, containing the information described in Paragraph 2 of Section XVII of such BMI Common Areas Phase 2 Consent Agreement. Amounts due hereunder shall be paid within thirty (30) days after receipt of each invoice by a check 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 such checks shall reference the name of the Site and the Company's name and address. Copies of all such checks and letters forwarding the checks shall be sent simultaneously to the Division Project Coordinator. Any failure by the Company to timely make any payment required under this Section shall be subject to the interest rate specified in Section XIV.

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

July 1, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Phase II Consent Agreement - Final

Dear Ms. Crowley:

Enclosed for your review is the final version of the Phase II Consent Agreement between Kerr-McGee Chemical Corporation (KMCC) and the Division concerning further activities at the KMCC Facility in Henderson, Nevada. Please review the document for completeness with respect to our recent telephone conversations and correspondence. To the best of my knowledge, all agreed to modifications have been made. The Consent Agreement also requires three (3) attachments: Attachment A is the August 14, 1994 Letter of Understanding; Attachment B is identical to Attachment B in the Common Areas Phase II Agreement (Exclusion Areas); and Attachment C is a description of the Former Montrose Facility. I will supply Attachments A and B when the signed document is returned to me. Attachment C may be supplied at a reasonable later date if not available for submittal with the signed copy.

Please forward copies to the appropriate individuals for signature. Note there are two signature pages. Please sign and return both for corresponding Division signatures. An original will be returned for your records.

Mr. John Edgcomb's draft letter regarding the 60 day response time for an approvable workplan after receipt of Division comments is acceptable and will be executed upon receipt.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021 respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:jm
cc: L.H. Dodgion, NDEP
V. Rosse, NDEP
D. Zimmerman, NDEP
W. Frey, NDAG
Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

CUTLER & STANFIELD, L.L.P.

700 Fourteenth Street, N.W.
Washington, D.C. 20005
Telephone: (202) 624-8400
Facsimile: (202) 624-8410

Ref: 08050-03

FACSIMILE COVER SHEET

TO:	FAX NUMBER:	TELEPHONE:
Robert Kelso	702 885 0868	702 687 5872

FROM: Barry Conaty

DATE: July 1, 1996

NUMBER OF PAGES (Including this cover sheet): 5

COMMENTS: Attached are our comments on the KMCC draft Work Plan for inclusion as commente of NDEP per the NDEP/City Letter of Understanding.

IF YOU HAVE DIFFICULTY RECEIVING THIS TRANSMISSION, PLEASE CALL: Andrea AT (202) 624-8400

JUNE 30, 1996

COMMENTS RE: KERR McGEE CHEMICAL CORPORATION
DRAFT MAY 1996 RESPONSE TO LETTER OF UNDERSTANDING
AND
DRAFT MAY 1996 PHASE II WORKPLAN

References herein are to "Draft LOU Response" and "Draft Workplan."

1. Except as indicated below (Comments 5 and 6), we concur with all NDEP draft comments communicated under cover letter dated June 21, 1996.

2. Bob, NDEP should consider informing KMCC that BOTH the Draft LOU Response and Draft Workplan will be considered as the "workplan" required by the Phase 2 Consent Agreement. There is a lot of cross-referencing that renders the two documents functionally one workplan.

3. LOU Item 3. The Draft LOU Response is only partially responsive. The LOU obligates KMCC to provide information regarding patterns of dispersion and probable deposition for <u>all</u> current <u>and historical</u> air emissions. The Draft LOU Response addresses only emissions from one process (manganese dioxide) for one year (1990). The assertion (Draft LOU Response at p. 2) that this process "was selected because it represents the majority of the emissions from the facility that are considered 'depositional.' is conclusory.

4. LOU Item 8. Plate 3 included in the Draft LOU Response shows data that is nearly three years old. The Plate should be updated.

5. LOU Item 8. Neither the Draft LOU Response nor the Draft Workplan provides the required "additional information on the ... regulatory/closure status, and release history" of this impoundment. What were the specific characteristics of the waste managed in this impoundment? What sampling criteria were used in determining the extent of "underlying soil" removal? Provide such sampling data and locations.

6. LOU Item 11. No environmental samples were collected when the "old drying pad" was demolished. Significant residual soil contamination could remain. The new replacement facility is only 18 feet wide (Phase I Report at p. 5-10). Thus, it should be feasible to collect appropriate confirmatory soil samples without penetrating the concrete pad/liner, i.e., boring on the slant from the side of the unit. In addition, more information is required regarding the apparent status of the "old drying pad" as a RCRA/NHWDL

regulated treatment, storage or disposal ("TSD") unit. The Draft LOU Response should be revised to reconcile the manner in which the old unit was closed in June 1991 according to Mr. Gaddy's observations (Draft LOU Response at App. 6) with the applicable RCRA/NIWDL unit closure regulations.

7. LOU Item 14. A clean closure equivalency petition is required. Note, however, that the issue is not whether residual chromium levels in soil are less than the former EP Toxicity regulatory threshold, but whether any contaminant present in the waste disposed in the unit remains at a total concentration in soil which exceeds NDEP action levels.

8. LOU Item 15.

- The Draft LOU Response should be revised to reconcile the detected total chromium levels in soil with applicable NDEP action levels set forth in the June 25, 1992 Contaminated Soil and Groundwater Policy.

- Further, reconcile the statement (Draft LOU Response p. 7) that "[s]oils under the pad were collected and analyzed" with the chain-of-custody statement (App. 8) that the soils were from "beside" the platinum drying pad.

- What are the dates of sample collection and analyses referenced in Appendix 8?

- What is the difference between "#1N" and "#2S" on the chain-of-custody form included in Appendix 8?

- Explain the implications for the detected concentration of chromium of the Comment included on the TCLP Analysis form in Appendix 8 that "aliquots diluted (1:10) to reduce acetate matrix interferences."

9. Provide further information regarding the decommissioning of Pond AP-2 (Draft LOU Response at p. 8), e.g., sampling data showing that soil contaminated at levels of concern was removed.

10. LOU Item 20. Provide further information regarding the closure of Pond C-1, e.g., sampling data showing that soil contaminated at levels of concern was removed.

11. LOU Items 24, 34. The Draft Workplan should be revised to include the collection of environmental samples from these areas sufficient to demonstrate that "these areas will not have the potential to impact ground water with manganese." The Draft LOU Response (p. 12) references TCLP data for

metals other than manganese in attempting to make this demonstration. This is inadequate.

12. LOU Item 28. Provide further information regarding the closure/removal of the Hazardous Waste Storage Area (SWMU KMCC-004). Explain why 4.5 feet of soil were removed. What testing in addition to TPH was performed to verify the removal of all soil contaminated at levels of concern.

13. LOU Item 43. NDEP should inform KMCC that the referenced report titled Groundwater Interception System Evaluation Report, Henderson, Nevada Facility submitted to NDEP on September 15, 1993 will be reviewed and evaluated under the Phase 2 Consent Agreement as an approvable deliverable.

14. LOU Item 43. The Draft Workplan should be revised to address the characterization of contamination in the unsaturated zone beneath Units 4 and 5. Such activities are necessary to evaluate the feasibility of removal/stabilization remedies. Further, such characterization activities are feasible.

15. A report of the 1993 "facility-wide sampling program" referenced throughout the Draft LOU Response should be provided to NDEP. The overall purpose and scope of this endeavor is not evident from the discussion in the Draft LOU Response.

16. LOU Item 47. Provide the required data/documentation for off-site resident exposure to manganese ore and/or manganese compounds.

17. LOU Item 56. Provide to NDEP a copy of each of the two reports.

18. LOU Items 59, 60. The Draft Workplan should be revised to include tasks to provide the required "documentation of system flow/integrity investigations." The Draft Workplan also should be revised to include tasks to "provide a technically based evaluation of the potential for soil and/or ground water contamination resulting from historic waste disposal through the acid drain system." The statement (Draft LOU Response p. 24) that the acid drain system has been "plugged" and is "no longer in use" does not address the issue of impacts from the historical use of such system.

19. NDEP should inform KMCC that the referenced report titled Subsurface Soil Evaluation, Former Evaporation Pond Sites, Former State Industries Facility appended to the Draft LOU Response (Appendix 16) will be reviewed and evaluated under

the Phase 2 Consent Agreement as an approvable deliverable. It should be noted in this regard, however, that considerably more information is necessary regarding the historical use, RCRA/NHWDL regulatory status, and closure of these impoundments by State Industries. In addition, there are numerous factual inconsistencies between the Appendix 16 report and the Phase I Report.

20. LOU Item 63. No sampling data is provided from the ground water monitoring wells installed by KMCC.

21. Draft Workplan at p. 2-3. No rationale is provided for limiting analyses on samples collected in Areas A and B to metals and soil pH, particularly in light of fact that nothing apparently is known regarding the nature of materials disposed in the open area south of the Trade Effluent Disposal Ponds.

22. Draft Workplan at p. 2-3 and Table 2. The text is inconsistent with the Table regarding whether the analysis will be for total metals (text) or just chromium. The analysis should be for total metals to establish the basis for clean closure.

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
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Water Pollution Control

STATE OF NEVADA
BOB MILLER
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DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

* * * * FAX COVER SHEET * * * *

DATE: 6/21/96

TO: Susan Crowley
Kerr-McGee

FAX NUMBER: (702) 651-2310

FROM: Bob Kerso
NDEP

SUBJECT/COMMENTS: Susan Enclosed are the comments on the Kmcc Q2 WP that have been forwarded to the City of Henderson. I apologize for the delay and have requested a response by 6/28/96 Bob

NUMBER OF PAGES INCLUDING COVER PAGE: 6

IF YOU HAVE ANY QUESTIONS, PLEASE CALL:

(702) 687 - 4670 x 3020

PETER G. MORROS, Director

L.H. DODGION, *Administrator*

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Address Reply to:
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Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
Carson City, Nevada 89710

June 21, 1996

MR BARRY CONATY ESQ
CUTLER & STANFIELD
700 FOURTEENTH STREET NW
WASHINGTON DC 20005

Subject: KMCC Phase II Workplan Comments

Dear Barry:

Attached for your review are NDEP's comments to the KMCC Phase II Work Plan and Response to the Letter of Understanding. Please provide any additional comments or corrections not later than June 28, 1996 for inclusion in the final transmittal to KMCC.

If you have any questions or I may be of further assistance, please contact me at (702) 687-4670, extensions 3020.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:jm

enclosure

cc: A. Biaggi

NDEP Comments to KMCC Phase II Submittal

Response to Letter of Understanding

1. LOU Item #1 - Attachment 1 provides the analytical data from DataChem for three (3) samples "in the vicinity" of WC-1 and WC-2. Please provide specific sample locations and indicate same on appropriate Figures.

2. LOU Item #3 - Please explain the comment regarding modifications to the April 1993 ECA Report. No change pages are provided with this submittal and the 19932 report appears unchanged.

3. LOU Item #4 - What were the activities and/or products of the additional tenants listed in KMCC's response, i.e., Ruth Mitchell; Nevada Clay Products Company; Allied Productions, Inc.; and U.S.Vanadium? Assuming Hardesty/Amecco did operate and produce chemical products, what is the most probable method and location of waste disposal and transport? How does KMCC propose to verify that none of these residual wastes remain on site?

4. LOU Item #6 - The Division has received and reviewed analytical results of the City of Henderson's sampling along the proposed Warm Springs Road Extension from Gibson to Eastgate Roads. We have not seen analytical results for the remaining section from Eastgate to Boulder Highway. This information will be forwarded to KMCC on receipt. Regarding KMCC's previous sampling data, please provide the locations of each sample and the rationale for excluding the 1-4 feet below ground surface sampling interval.

5. LOU Item #11 - Due to the difficulty involved in obtaining confirmatory samples from the "old drying pad" area, they are not required at the current time. The Division may require these samples, including Chromium VI, on facility decommissioning or pad removal/replacement.

6. LOU Item # 14 - Attachment 7 has been reviewed by the Bureau of Waste Management personnel as summarized in enclosed memo from J. Denison, dated June 13, 1996. Based on the information in Attachment 7, chromium does not appear to be a concern, however, one must question how the liquid waste stream entering the impoundment failed the EP Tox test (per the Phase I documentation), and the evaporated solids and soils managed to pass. Any additional information you have on this occurrence would be very enlightening.

7. LOU #16 & #17 - The requested summary diagram/facility map shows all AP impoundments and waste management units/areas except the on-site Hazardous Waste Landfill. Please include the landfill location on the appropriate drawing or drawings.

8. LOU #28 - Please provide additional detail regarding hydrocarbon removal at the hazardous waste storage area, i.e., volume of material removed, location of samples, disposal receipts, etc. Also what were the "elevated levels of TPH" shown by soil testing and what other materials were analyzed for?

9. LOU # 39 - Provide a schedule for the additional soil removal, analysis and reporting. What are the elevated TPH levels still present and the extent of the contamination? This Item may be more appropriate to the Workplan for ease of management and tracking.

10. LOU #41 - See Comment 9 above for LOU #39.

11. LOU #43 - The Division is unable to locate the referenced document (Groundwater Interception System Evaluation Report, Henderson, Nevada Facility) prepared by the Kerr-McGee Hydrology Department. Please provide a copy for review and evaluation in response to the request of LOU #43. Additional KMCC effort may be required based on the results of this review.

12. LOU #56 - Additional clarification of this response is required. For example, does "initial treatment" refer to application of AP to the soil or application of a methodology to remove/reduce it? If the later, it appears to have been a failure. Also, since the referenced reports are over 20 years old and the literature search was brief, is anyone actively investigating AP environmental impacts at the current time. I understand that an AP working group, composed of producers and users, is also concerned about this issue. Is any information available from this group?

13. LOU #59 - The LOU requests a list of analytes "...currently monitored for and the latest data." Please provide this information along with the locations at which the samples were taken.

14. LOU #60 - What is the status of the acid drains in the non-operating portion of the plant? What material/contaminants can get into these drains and be distributed throughout the system? What techniques have been employed to verify the integrity of this system? What does KMCC plan to do with the unplugged portion?

15. LOU #63 - Please provide a copy of the final report and the closure letter from Clark County regarding the June 1991 tank removal at the J.B. Kelley Site.

16. LOU # 64 through 67 - Page 26 is missing from this document. Please provide this page and the responses to the referenced LOU's.

17. LOU # 68 - KMCC's response indicates other "visits" to the Nevada Recycling Corporation site since September 1993. What was the outcome of these visits? Provide copies of any reports and subsequent correspondence. How does KMCC intend to verify site cleanliness after lease termination? Include this as a discussion item in the workplan.

Phase II Workplan

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23. Section 2.3.7 (J.B. Kelley/LOU #63) - Again, provide rationale for limiting analyses to metals and pH. Truck washing and maintenance activities could indicate the historical use of solvents for cleaning and degreasing.

June 13, 1996

MEMORANDUM

TO: Bob Kelso

FROM: Jeff Denison

RE: Letter (June 11, 1996) from J.T. Smith / Kerr McGee / BMI

My major comment is in reference to Item #5 on Page 2 of J.T. Smith's letter.

I have evaluated "Attachment 7" and find that this information alone does not suffice as demonstration that "clean closure" has been achieved under the standard of 40 CFR 264.228 and 270.1.--if for no other reason than it fails to follow the "Procedures for closure equivalency determination" [270.1(c)(6)].

Because impoundments P-1 and S-1 certified closure (according to 265.115) after January 26, 1983, they are subject to post-closure permits unless it is demonstrated that "closure by removal" has been provided under 40 CFR 270.1(c)(5) and (6) [See 270.1(c)].

Because a Part B application for a post-closure permit has not been submitted, Kerr McGee should formally petition the Administrator for a determination that a post-closure permit is not required because the closure met the applicable Part 264 closure standards [270.1(c)(5)(ii)]. The petition must include data demonstrating that closure by removal or decontamination standards were met or exceeded. This petition should obviously include, but may not be limited to, the information in "Attachment 7" in order to receive approval. In any event, the Division will approve or deny the petition within 90 days of its receipt according to the procedures outlined in paragraph (c)(6) of 270.1 and will provide the public the opportunity to submit written comments on the information submitted, etc... .

Again, in reference to Item 5, it is unlikely that a petition could be received and a determination made "during the period for further review of the Workplan and LOU response." I also made a suggestion to remove the last phrase of Item 14.

See me to discuss any further questions.

June 13, 1996

MEMORANDUM

TO: Bob Kelso

FROM: Jeff Denison

RE: Letter (June 11, 1996) from J.T. Smith / Kerr McGee / BMI

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Because impoundments P-1 and S-1 certified closure (according to 265.115) after January 26, 1983, they are subject to post-closure permits unless it is demonstrated that "closure by removal" has been provided under 40 CFR 270.1(c)(5) and (6) [See 270.1(c)].

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Again, in reference to Item 5, it is unlikely that a petition could be received and a determination made "during the period for further review of the Workplan and LOU response." I also made a suggestion to remove the last phrase of Item 14.

See me to discuss any further questions.

L. H. DODGION
Administrator

Administration:
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Fax 687-5856

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DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

* * * * FAX COVER SHEET * * * *

DATE: 6/13/95

TO: SUSAN STEWART - TIMET
(702) 565-2689
BARRY SANDALS - MORRISON & FOERSTER
(415) 677-7522

FAX NUMBER:

FROM: BOB KERSO
NDEP

SUBJECT/COMMENTS: SUSAN/BARRY
ATTACHED ARE THE FINAL VERSIONS OF SECTIONS III.F & XVII. THEY SHOULD MATCH DEP's LETTER OF 3 JUNE. LET ME KNOW IF THERE ARE ANY PROBLEMS.

NUMBER OF PAGES INCLUDING COVER PAGE: 5

IF YOU HAVE ANY QUESTIONS, PLEASE CALL:

(702) 687 - 4670 x3020

F. NEVADA HAZARDOUS WASTE DISPOSAL LAW COMPLIANCE

1. For purposes of this Section IV.F, the terms "hazardous constituent," "hazardous waste," "landfill," "land treatment unit," "pile" and "surface impoundment" shall have the meanings specified in 40 C.F.R. § 260.10, each as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632. The term "Subject Unit" means each landfill, land treatment unit, surface impoundment, or waste pile unit located at the Site which received hazardous waste after July 26, 1982, or with respect to which closure was certified pursuant to 40 C.F.R. § 265.115, as adopted by reference in the Nevada

OVINGTON & BURLING
1201 PENNSYLVANIA AVENUE, N. W.
P.O. BOX 7566
WASHINGTON, D.C. 20044-7566
(202) 662-6000

TELEFAX: (202) 662-6291
TELEX: 89-593 (COVLING WSH)
CABLE: COVLING

J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

LECONFIELD HOUSE
CURZON STREET
LONDON W1Y 8AS
ENGLAND
TELEPHONE: 44-171-495-5655
TELEFAX: 44-171-495-3101

BRUSSELS CORRESPONDENT OFFICE
44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-512-9890
TELEFAX: 32-2-502-1598

June 11, 1996

BY FACSIMILE AND FIRST CLASS MAIL

Mr. Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental
Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

Dear Bob:

Thank you for meeting with representatives of the Kerr-McGee Chemical Corporation (KMCC) on June 5, 1996, to discuss completion of a Phase II consent agreement between KMCC and the Division of Environmental Protection (the Division). This letter will confirm that KMCC's management agrees to sign a Phase II Consent Agreement prior to final approval and incorporation of a Workplan for an Environmental Conditions Investigation at its Henderson, Nevada facility based upon the understanding and conditions that we discussed on June 5.

These understandings and conditions are as follows:

1. KMCC will sign an agreement that is substantially the same as the Division's March 26, 1996 draft -- modified in only two respects. First, the Division has agreed to amend Section IV.F. to substitute the language forwarded KMCC on April 29. Second, the Division will modify the first paragraph of Section XVII (Reimbursement of Division Oversight Costs) as set forth in your letter of June 3, 1996 to Joel Mack. The Division will forward KMCC a clean, signature copy of the agreement reflecting these changes.

2. The Division will not expect KMCC's signature on this Agreement until it receives further information regarding the comments of the Division, its IT contractor and by the City of Henderson. The latter has agreed to review comments of the Division and IT. You have agreed to share with KMCC the materials that you will be forwarding to Henderson. It is the Division's hope to complete the initial review process, including comments by the City of Henderson by June 21, 1996. You have shared with KMCC the preliminary comments of the Division and IT, and have represented that your review to date has not identified any "fundamental" issues. Indeed, you have represented that KMCC's Workplan and the accompanying response to the Letter of Understanding (LOU) appear to be "95%" complete. In the unlikely event that further review turns up any new "fundamental" issues, we have agreed that there will be an opportunity to resolve such issues prior to the time that KMCC would be compelled to sign a Phase II Agreement.

3. Given the importance of the "fundamental" issue concept, we discussed our mutual understanding of this term. A "fundamental" issue is one that would significantly increase the likely scope and cost of KMCC's Phase II obligations. Reasonable requests for more sampling points or analytes would not be deemed "fundamental." In contrast, a requirement to initiate systematic sampling and planning for removal of chromium contaminated soil beneath the production facilities would definitely be considered "fundamental."

4. You have identified only one aspect of the LOU response that may require some expansion of the draft Workplan. It is whether KMCC can fairly be required to do groundwater sampling for additional analytes at the groundwater monitoring wells installed on the J.B. Kelley lease site in an effort to characterize potential environmental impacts from any operations that may have been conducted in that area by a previous tenant, the Hardesty Chemical Company. We have agreed to continue to examine the issue of whether the groundwater monitoring done by KMCC at the Kelley site suffices to demonstrate that no significant contamination occurred as a result of any Hardesty operations.

5. During the period for further review of the Workplan and LOU response, the Division will examine whether documents submitted by KMCC as Attachment 7 to the LOU response regarding residual contamination levels in the old surface impoundments, P-1 and S-1, suffices to demonstrate that "clean closure" has been achieved under the standard of 40 C.F.R. §§ 264.228 and 270.1.

The Division will advise KMCC of its conclusions in this regard before signature of the Phase II Agreement is required.

6. Although it is likely that KMCC will be required to sign the Phase II Agreement before it receives formal comments on the Workplan and LOU Response, the Division will submit such comments in the form of an "approval with conditions" or by other appropriate means -- in contrast to a Notice of Disapproval pursuant to Section VI, which would trigger rigid deadlines and potentially trigger stipulated penalties.

I would appreciate receiving confirmation from you that the Division shares the understandings summarized in this letter. KMCC looks forward to continued constructive cooperation with the Division in carrying out the Phase II process.

Sincerely,

John T. Smith II

cc: Alex Biaggi
Verne Rosse
William Frey
Legal Subcommittee
Susan Stewart

COVINGTON & BURLING
1201 PENNSYLVANIA AVENUE, N. W.
P.O. BOX 7566
WASHINGTON, D.C. 20044-7566
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TELEPHONE: 32-2-512-9890
TELEFAX: 32-2-502-1598

J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

June 11, 1996

BY FACSIMILE AND FIRST CLASS MAIL

Pond
P-1
&
S-1
Copies documentation attached.
File for Ref.

Mr. Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

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? IS THIS CORRECT?

2. The Division will not expect KMCC's signature on this Agreement until it receives further information regarding the comments of the Division, its IT contractor and by the City of Henderson. The latter has agreed to review comments of the Division and IT. You have agreed to share with KMCC the materials that you will be forwarding to Henderson. It is the Division's hope to complete the initial review process, including comments by the City of Henderson by June 21, 1996. You have shared with KMCC the preliminary comments of the Division and IT, and have represented that your review to date has not identified any "fundamental" issues. Indeed, you have represented that KMCC's Workplan and the accompanying response to the Letter of Understanding (LOU) appear to be "95%" complete. In the unlikely event that further review turns up any new "fundamental" issues, we have agreed that there will be an opportunity to resolve such issues prior to the time that KMCC would be compelled to sign a Phase II Agreement.

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I would appreciate receiving confirmation from you that the Division shares the understandings summarized in this letter. KMCC looks forward to continued constructive cooperation with the Division in carrying out the Phase II process.

Sincerely,

John T. Smith II

cc: Alex Biaggi
Verne Rosse
William Frey
Legal Subcommittee
Susan Stewart

BOB - I WASN'T PART OF THE CONV. SO I HAVE TO RELY ON YOU & VERNE ON CONTENT. WE WANT TO BE SURE THIS IS CONSISTENT W TALKS W JOEL ET. AL. ALSO POINTS OUT A NEED TO STAY AWAY FROM WORD SUCH AS "FUNDAMENTALLY" AND "BASICALLY"; THEY USE THEM AGAINST US. WE PROBABLY NEED TO HOLD A TIGHTER LINE.

Review plan & associated letters

10) On-Site Hazardous Waste Landfill, SWMU KMCC-013:

Provide the Division with copies of correspondence relating to the closure and post-closure status of the landfill. This information should include the post-closure plan.

Attachment 5 contains the Closure/Post Closure Plan for the on-site hazardous waste landfill. Also provided in Attachment 5 are the April 16, 1985, and the January 17, 1986, letters from NDEP concerning the landfill.

11) SWMU KMCC-005:

Provide specific information (i.e. volume of material, depth of excavation, criteria used to determine extent of contamination, etc.) relating to the removal of the "old drying pad" and underlying fill material and native soils. Provide an evaluation of the feasibility of collecting confirmatory samples of soil from beneath the area of the old pad.

Alan Gaddy, former Environmental Engineer for KMCC, was present at the time that the original drying pad was removed. Attachment 6 contains a summary of his observation regarding the scope of the work completed. The current pad was built directly over the old pad and is underlain by a synthetic liner. This liner serves as secondary containment in the event that the pad should leak.

Obtaining a sample from directly beneath the pad, which would be the location of greatest potential for contamination, would require penetration of the liner thus compromising its integrity. Based on observations of Mr. Gaddy, all discolored soil plus additional soil was removed from beneath the old pad. As such, KMCC believes that confirmatory sampling is not warranted.

12) Hazardous Waste Storage Area, SWMU KMCC-006:

No further action is required at this time.

13) Pond S-1:

No further action is required at this time. A review of the RCRA permit status of this SI may be required pending the outcome of Phase II investigations. ?

14) Pond P-1, and Associated Conveyance Piping:

KMCC will provide Closure documentation for this impoundment. A review of the RCRA permit status of this SI may be required pending the outcome of Phase II investigations. ~~No further action is anticipated.~~ ?

KMCC will provide Closure documentation for this impoundment. A review of the RCRA permit status of this SI may be required pending the outcome of Phase II investigations. No further action is anticipated.

Attachment 7 contains a letter from Thomas J. Fronapfel, P.E., of the NDEP, to Rolfe B. Chase, Jr., of KMCC, stating that the "impoundments have been properly closed, and that they no longer remain under the interim status standards of 40 CFR Part 265". Also included in Attachment 7 is a copy of the analytical results obtained from both P-1 and S-1 that KMCC collected as part of the clean closure demonstration. (Due to the poor quality of the original, some of the values have been penciled in next to the printed value for clarity.)

15) Platinum Drying Unit, SWMU KMCC-007:

KMCC will provide either analytical data or a technically based argument supporting their contention that minor staining of the soil surrounding this unit is not a threat to either human health or the environment and is not a violation of State or Federal regulations. Included in this information shall be a discussion of how KMCC has revised housekeeping practices so as to eliminate or minimize further releases of waste material from this unit.

Since the LOU was issued, KMCC has removed the platinum sludge unit. This was done to make way for construction of the new boron and boron trichloride plant which now covers the area previously occupied by the pad. In preparation for plant construction, the pad was removed and disposed of at U. S. Ecology, Beatty, NV. Soils under the pad were collected and analyzed for <u>total</u> chromium. Chromium concentrations were below regulatory limits (see Attachment 8).

The TCLP results of material in the platinum sludge drying area collected in January 1993 showed that all metals were below the method detectable limit with the exception of chromium which had a concentration of 1.1 mg/l (see Attachment 8). Based on these results, any material that may have escaped from the unit was below regulatory levels.

16 & 17) Ponds AP-1 and AP-2, and Associated Transfer Lines and Ponds AP-3 and Associated Transfer Lines:

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from these impoundments. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

ATTACHMENT 7

LOU ITEM 14

POND P-1 CLOSURE DOCUMENTATION

(131)

RICHARD H. BRYAN
Governor

RECEIVED

DEC 9 1985

R.B. CHASE

STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
Carson City, Nevada 89710
(702) 885-4670

December 5, 1985

Rolfe B. Chase, Jr.
Plant Manager
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, NV 89015

Certified Mail #P336 765 599
Return Receipt Requested

Dear Mr. Chase:

The Division has completed its review of the closure certifications for the S-1 and P-1 impoundments and for the hazardous waste landfill, dated September 4, 1985, September 6, 1985 and October 22, 1985, respectively.

The S-1 and P-1 impoundments appear to have been closed in accordance with the closure plan for these impoundments dated September 26, 1984, and approved by the Division on April 16, 1985. The Division hereby acknowledges that these impoundments have been properly closed, and that they no longer remain under the interim status standards of 40 CFR Part 265.

With regard to the hazardous waste landfill, the certification does not appear to conform to the approved closure plan. Specifically, the closure plan specified a final cover slope of 3 to 5 percent, whereas the installed final cover slope is verified as 1 percent North to South and 3 percent East to West. Although no specific slope is required by regulation, closure must be done in accordance with the approved closure plan. Therefore, it is necessary for KMCC to show that the 1 percent slope will prevent infiltration and that it will provide adequate drainage away from the landfill cell. Please submit this information to the Division within fifteen (15) days of receipt of this letter.

Should you have any questions concerning this matter, please contact me.

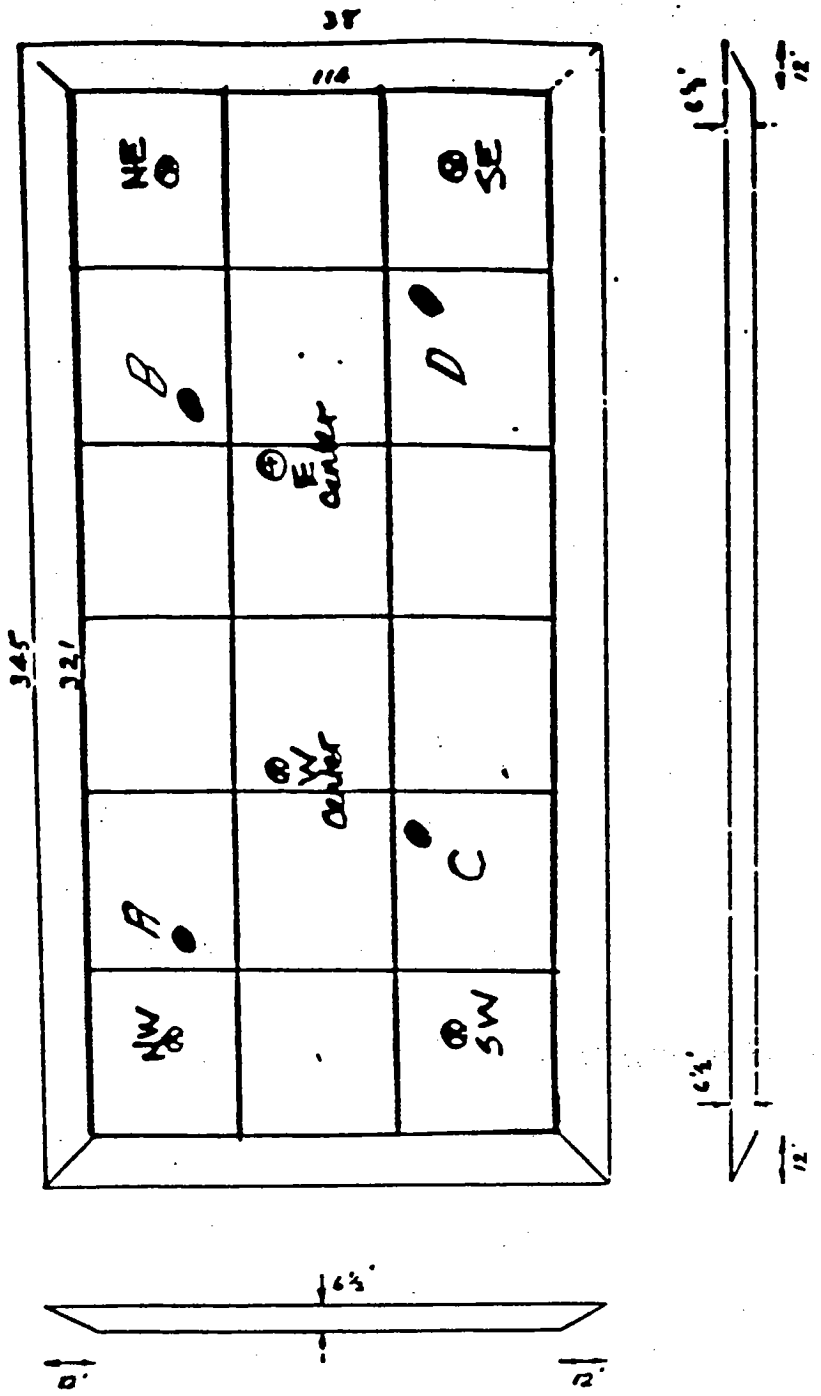
Sincerely,

Thomas J. Fronapfel

Thomas J. Fronapfel, P.E.
Environmental Engineer
Waste Management Section

TJF/pr

cc: Gary Lance, EPA Region IX



EVAPORATION POND S-1

Analyses Attached

Figure 1

Pond S-1

CHAIN OF CUS. ECORD— ENVIRONMENTAL SAMPLES NM-0770

FACILITY	SAMPLING FIRM	SAMPLE
NAME: KMCC Henderson	NAME: Desert Research Institute	☐ Effluent ☐ Groundwat
ADDRESS: Box 55	ADDRESS:	☑ Solid ☐ Surface Wa
Henderson, NV. 89015	SIGNATURE:	☐ Soils

NO.	LOCATION	DATE	TIME	WEATHER TEMP	WEATHER PREC	SAMPLE TYPE AND METHOD COMP.	GRAB	MECH	MAN	TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
1	S-1 NW Corner	3/2/84		70s	Haze							Nitric Acid Extraction leachate analyzed for Chromium	1 composite at each loc comprise... grab sampl... for ... for ...
2	S-1 SW Corner												
3	S-1 W Center												
4	S-1 E Center												
5	S-1 NE Corner												
6	S-1 SE Corner												
M-1	background												
M-21	background												
M-4	background												
T	tails	↓		↓	↓							EP Toxicity ext. all metals	3 grab.

RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME

DISPATCHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY (SIGNATURE)	DATE	TIME
			[signature]	3/6/84	9:56

CARRIER

ADDRESS: 90001402

METHOD OF SHIPMENT

LABORATORY: DESERT RESEARCH INST. WRC

ADDRESS: 7010 DANDINI BLVD

RENO NV 89512

ADDITIONAL REMARKS

ALL ANALYSIS PERFORMED BY EPA APPROVE PROCEDURES

☒ Yes ☐ No, explain above

KERR-McGEE C ORATION

CHAIN OF CUSTODY RECORD — ENVIRONMENTAL SAMPLES KM-4778

FACILITY
NAME: Kerr McGee Chem Corp
ADDRESS: P.O. Box 55
Henderson NV. 89015

SAMPLING FIRM
NAME: SAME + Desert Research Inst
ADDRESS:
SIGNATURE: Kevin V. Epstein

SAMPLE
☐ Effluent ☐ Groundwater
☑ Solid ☐ Surface Water
☐

NO.	LOCATION	DATE	TIME	WEATHER TEMP.	WEATHER PREC.	SAMPLE TYPE AND METHOD COMP.	GRAB	MECH	MAN.	TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
A-1	NW Corner Pond S-1, 1' Depth	8-24-84	11:00	95	—		✓	✓		NA	1 BAG	Chromium	Analyze by Lab Ep. Tox. and Nitric Acid for Chromium
A-2	NW Corner S-1, 2' Depth	8-24-84	"	95	—		✓	✓		"		"	
A-3	NW Corner S-1, 3' Depth	8-24-84	"	"	—		✓	✓		"			
A-4	NW Corner S-1, 4' Depth	8-24-84	"	"	—		✓	✓		"			
A-5	NW Corner S-1, 5' Depth	8-24-84	"	"	—		✓	✓		"			
A-6	NW Corner S-1, 6' Depth	8-24-84	1115	"	—		✓	✓		"			
B-1	NE Corner S-1, 1'	8-24-84	1115	"	—		✓	✓		"			
B-2	NE Corner S-1, 2'	8-24-84	1117	"	—		✓	✓		"			
B-3	NE Corner S-1, 3'	8-24-84	1120	"	—		✓	✓		"			
B-4	NE Corner S-1, 4'		1125	"	—		✓	✓		"			
B-5	NE Corner S-1, 5'		1130	"	—		✓	✓		"			

RELINQUISHED BY (SIGNATURE): Frederick P. Staten — RECEIVED BY (SIGNATURE): — DATE: Aug 24 84 — TIME:
RELINQUISHED BY (SIGNATURE): — RECEIVED BY (SIGNATURE): — DATE: — TIME:
RELINQUISHED BY (SIGNATURE): — RECEIVED BY (SIGNATURE): — DATE: — TIME:
DISPATCHED BY (SIGNATURE): — DATE: — TIME:
RECEIVED FOR LABORATORY (SIGNATURE): — DATE: 27 AUG 84 — TIME: 12:30
CARRIER:
LABORATORY: Bert Elliott
ADDRESS: 9000140S
ADDRESS: DRI WATER LAB RENO NV
METHOD OF SHIPMENT:

ADDITIONAL REMARKS:

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES
☒ Yes ☐ No, explain above.

KERR-McGEE CORPORATION

CHAIN OF CUSTODY RECORD — ENVIRONMENTAL SAMPLES KM-4178

FACILITY	SAMPLING FIRM	SAMPLE
NAME: Kerr McGee Chem Corp	NAME: Some & DRI	☐ Effluent ☐ Groundwater
ADDRESS: P.O. Box 55	ADDRESS: Reno NV	☒ Solid ☐ Surface Water
Henderson NV 89015	SIGNATURE:	☐ Soil Sample

NO.	LOCATION	DATE	TIME	WEATHER TEMP.	WEATHER PREC.	SAMPLE TYPE AND METHOD COMP.	GRAB	MECH	MAN.	TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
B-6	NE Corner S-1, 6'	8-24-84	1130	95	—		✓	✓	"	NA	1 Bag	Chromium	Analyze by
C-1	SW Corner S-1, 1'	8-24-84	1135	95	—		✓	✓		"	1 Bag		Leach E
C-2	SW Corner S-1, 2'	8-24-84	1137	"	—		✓	✓		"	1 Bag		Tolic and
C-3	SW Corner S-1, 3'	8-24-84	1140	"	—		✓	✓		"	1 Bag		Nitric Acid
C-4	SW Corner S-1, 4'	8-24-84	1145	"	—		✓	✓		"	1 Bag		Extraction of
C-5	SW Corner S-1, 5'	8-24-84	1147	"	—		✓	✓		"	1 Bag		Chromium.
C-6	SW Corner S-1, 6'	8-24-84	1150	"	—		✓	✓		"	1 Bag		
D-1	SE Corner S-1, 1'	8-24-84	1155	"	—		✓	✓		"	1 Bag		
D-2	SE Corner S-1, 2'	8-24-84	1158	"	—		✓	✓		"	1 Bag		
D-3	SE Corner S-1, 3'	8-24-84	1200	"	—		✓	✓		"	1 Bag		
D-4	SE Corner S-1, 4'	8-24-84	1205	"	—		✓			"	1 Bag	✓	

RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME
[signature]		8-24-84	
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME
RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME

DISPATCHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY (SIGNATURE)	DATE / TIME
			[signature]	27/84 / 12:30
CARRIER			LABORATORY	
			[signature]	
ADDRESS			ADDRESS	
			DRI WATER LAB RENO NV	
METHOD OF SHIPMENT				
90001403				

ADDITIONAL REMARKS

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES

☒ Yes ☐ No, explain above.

KERR-McGEE CORPORATION

CHAIN OF CUSTODY RECORD — ENVIRONMENTAL SAMPLES KM-0770

FACILITY

NAME: Kerr McGee

ADDRESS: PO Box 55
Henderson NV 89015

SAMPLING FIRM

NAME: Same + DRI

ADDRESS:

SIGNATURE:

SAMPLE

☐ Effluent ☐ Groundwater
☑ Solid ☐ Surface Water
☐ Soil Sample

NO.	LOCATION	DATE	TIME	WEATHER TEMP.	WEATHER PREC.	SAMPLE TYPE AND METHOD COMP.	GRAB	MECH	MAN.	TIMES CASING CLEARED	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
D-5	SE Corner S-1	8-24-84	1205	95	-		✓	✓		NA	1 Bag	Chromium by EP Tox	
D-6	SE Corner S-1	8-24-84	1210	95	-		✓	✓		NA	1 Bag	and Nitric Acid Extraction	

RELINQUISHED BY (SIGNATURE): [signature] — RECEIVED BY (SIGNATURE): — DATE: 8-24-84 — TIME:

RELINQUISHED BY (SIGNATURE): — RECEIVED BY (SIGNATURE): — DATE: — TIME:

RELINQUISHED BY (SIGNATURE): — RECEIVED BY (SIGNATURE): — DATE: — TIME:

DISPATCHED BY (SIGNATURE): — DATE: — TIME:

RECEIVED FOR LABORATORY (SIGNATURE): [signature] — DATE: 8/24/84 — TIME: 12:30

CARRIER:

ADDRESS: 90001404

METHOD OF SHIPMENT:

LABORATORY: DRI WATER LAB

ADDRESS: RENO NV

ADDITIONAL REMARKS:

ALL ANALYSIS PERFORMED BY EPA APPROVED PROCEDURES

☒ Yes ☐ No

SEP 24

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

REPORT DATE: 20-SEP-84
FILE NAME: 7714M.TB_

LAB # / DATE	SAMPLE POINT	CR MG/L		
7714	EP-TOX S1			
8-MAR-84	NW CORNER	0.05	0.05	mg/l
7715	EP-TOX S2			
8-MAR-84	SW CORNER	<.02	<.02	
7716	EP-TOX S3			
8-MAR-84	W CENTER	<.02	<0.02	
7717	EP-TOX S4			
8-MAR-84	E CENTER	0.11	0.11	
7718	EP-TOX S5			
8-MAR-84	NE CORNER	0.02	0.02	
7719	EP-TOX S6			
8-MAR-84	SE CORNER	<.02	<0.02	
7720	EP-TOX M1			
8-MAR-84	BACKGROUND	<.02	<0.02	
7721	EP-TOX M2			
8-MAR-84	BACKGROUND	<.02	<0.02	
7722	EP-TOX M3			
8-MAR-84	BACKGROUND	<.02	<0.02	

Table I

OLP 17 1984

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

REPORT DATE: 13-SEP-84
FILE NAME: 870:KM.TBL

LAB # / DATE	SAMPLE POINT	CR EPTOX	
8701 24-AUG-84	A-1	.03	0.03
8702 24-AUG-84	A-2	<.02	<0.02
8703 24-AUG-84	A-3	.02	0.02
8704 24-AUG-84	A-4	.02	.02
8705 24-AUG-84	A-5	<.02	<.02
8706 24-AUG-84	A-6	<.02	<.02
8707 24-AUG-84	B-1	<.02	<.02
8708 24-AUG-84	B-2	<.02	<.02
8709 24-AUG-84	B-3	<.02	<.02
8710 24-AUG-84	B-4	<.02	<.02
8711 24-AUG-84	B-5	<.02	<.02
8712 24-AUG-84	B-6	<.02	<.02
8713 24-AUG-84	C-1	<.02	<.02
8714 24-AUG-84	C-2	<.02	<.02
8715 24-AUG-84	C-3	<.02	<.02

RESULTS ON EP-TOX EXTRACTS REPORTED IN MG/L.

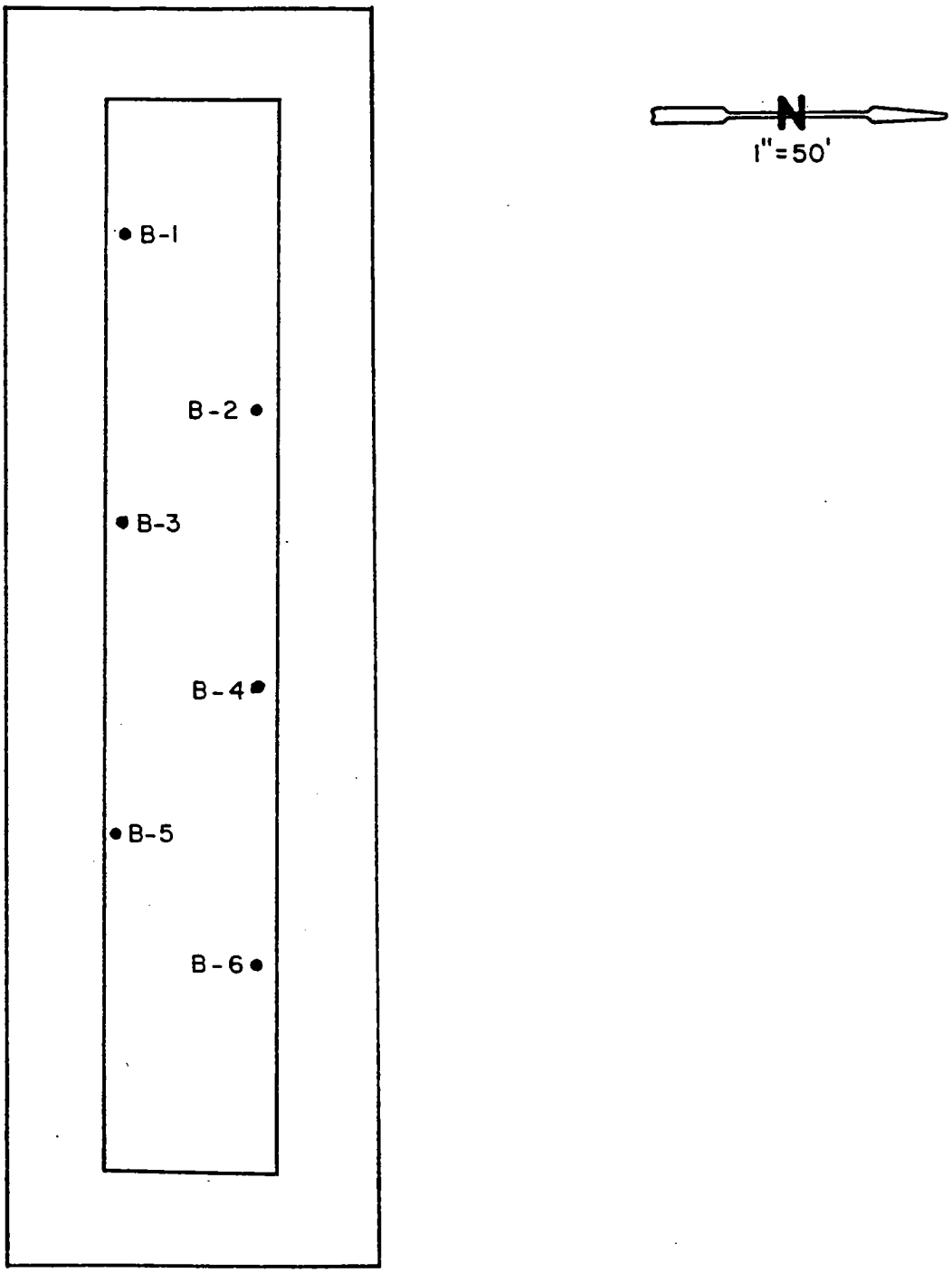
Table I (continued)

WATER ANALYSIS LABOR[illegible]ORY
DESERT RESEARCH INSTITUTE

REPOR[illegible] DATE: 13-SEP-84
FILE NAME: 8701KM.TBL

LAB # / DATE	SAMPLE POINT	CR EPTOX	
8716 24-AUG-84	C-4	<.02	<0.02
8717 24-AUG-84	C-5	<.02	<0.02
8718 24-AUG-84	C-6	<.02	<0.02
8719 24-AUG-84	D-1	.01	0.02
8720 24-AUG-84	D-2	<.02	<0.02
8721 24-AUG-84	D-3	<.02	<0.02
8722 24-AUG-84	D-4	<.02	<0.02
8723 24-AUG-84	D-5	<.02	<0.02
8724 24-AUG-84	D-6	<.02	<0.02

RESULTS IN [illegible] ARE QUOTED IN MG/L.



• B-2: Approximate Location of Exploratory Boring

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. L-1359-3

PLOT PLAN
POND P-1

CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature) Paul A. Davis (Paul A. Davis)

Phone: 702-736-2936

SHIP TO:
DESERT RESEARCH INST.
7010 DANDINI
SPARKS, NV 89431
ATTN: WRC LAB

ATTENTION:

Phone No.

SHIPPING INFORMATION

Shipper

Address

Date Shipped

Shipment Service

Airbill No.

Cooler No.

Relinquished by: (Signature) William Siegel	Received by: (Signature) Mary Pleasant	Date/Time 8-12-85 11:24
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Receive for laboratory by*: (Signature)	Date/Time 8-13-85 11:30

*Analysis laboratory should complete, "sample condition upon receipt", section below, sign and return top copy to J. H. KLEINFELDER & ASSOCIATES, 5115 South Industrial Road, Suite 605, Las Vegas, Nevada 89118

Sample Number	Site Identification	Date Sampled	Analysis Requested	Sample Condition Upon Receipt
0-½	B-1	8-9-85	Chromium	GOOD
½-1½	B-1			
1½-2½	B-1			
2½-3½	B-1			
3½-4½	B-1			
0-½	B-2			
½-1½	B-2			
1½-2½	B-2			
2½-3½	B-2			
3½-4½	B-2			
0-½	B-3			
½-1½	B-3			
1½-2½	B-3			
2½-3½	B-3			
3½-4½	B-3			
0-½	B-4			
½-1½	B-4			
1½-2½	B-4			
2½-3½	B-4			
3½-4½	B-4			

Form A-382 (Rev. 7/82) White-Sampler Canary- J. H. KLEINFELDER & ASSOCIATES Pink-Lab Courtesy Copy

CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature) Paul H. Davis (Paul H. Davis)

Phone: 702-736-2936

SENT TO:
DESERT RESEARCH INST.
2770 DANDINI
SPARKS, NV

ATTENTION: WRCC LAB

Phone No.

SHIPPING INFORMATION

Shipper
Address
Date Shipped
Shipment Service
Airbill No.
Cooler No.

	Received by: (Signature)	Date/Time
Relinquished by: (Signature) William Siegel	Mary Hinman	8/12/85 11:24
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Receive for laboratory by*: (Signature)	Date/Time
	[illegible]	8-13-85 11:2[illegible]

*Analysis laboratory should complete, "sample condition upon receipt", section below, sign and return top copy to J. H. KLEINFELDER & ASSOCIATES, 5145 South Industrial Road, Suite 605, Las Vegas, Nevada 89118

Sample Number	Site Identification	Date Sampled	Analysis Requested	Sample Condition Upon Receipt
C ½	B-5	8-9-85	Chromium	GOOD
½-1½	B-5			
1½-2½	B-5			
2½-3½	B-5			
3½-4½	B-5			
0-½	B-6			
½-1½	B-6			
1½-2½	B-6			
2½-3½	B-6			
3½-4½	B-6			

Form A-382 (Rev. 7/82)
White-Sampler Canary- J. H. KLEINFELDER & ASSOCIATES Pink-Lab Courtesy Copy

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

REPORT DATE: 22-AUG-85
FILE NAME: 9735KL.TBL

LAB # / DATE	SAMPLE POINT	CR MG/L
9735 9-AUG-85	B-1 0 - .5'	0.11
9736 9-AUG-85	B-1 .5 - 1.5'	<.10
9737 9-AUG-85	B-1 1.5 - 2.5'	<.10
9738 9-AUG-85	B-1 2.5 - 3.5'	<.10
9739 9-AUG-85	B-1 3.5 - 4.5'	<.10
9740 9-AUG-85	B-2 0 - .5'	0.41
9741 9-AUG-85	B-2 .5 - 1.5'	0.10
9742 9-AUG-85	B-2 1.5 - 2.5'	<.10
9743 9-AUG-85	B-2 2.5 - 3.5'	<.10
9744 9-AUG-85	B-2 3.5 - 4.5'	<.10
9745 9-AUG-85	B-3 0 - .5'	0.27
9746 9-AUG-85	B-3 .5 - 1.5'	<.10
9747 9-AUG-85	B-3 1.5 - 2.5'	<.10
9748 9-AUG-85	B-3 2.5 - 3.5'	<.10
9749 9-AUG-85	B-3 3.5 - 4.5'	<.10

CHROMIUM ANALYSIS ON EP-TOX EXTRACTS

WATER ANALYSIS LABORATORY
DESERT RESEARCH INSTITUTE

REPORT DATE: 22-AUG-85
FILE NAME: 9735KL.TBL

LAB # / DATE	SAMPLE POINT	CR MG/L
9750 9-AUG-85	B-4 0 - .5'	< .10
9751 9-AUG-85	B-4 .5 - 1.5'	< .10
9752 9-AUG-85	B-4 1.5 - 2.5'	< .10
9753 9-AUG-85	B-4 2.5 - 3.5'	< .10
9754 9-AUG-85	B-4 3.5 - 4.5'	< .10
9755 9-AUG-85	B-5 0 - .5'	0.21
9756 9-AUG-85	B-5 .5 - 1.5'	< .10
9757 9-AUG-85	B-5 1.5 - 2.5'	< .10
9758 9-AUG-85	B-5 2.5 - 3.5'	< .10
9759 9-AUG-85	B-5 3.5 - 4.5'	< .10
9760 9-AUG-85	B-6 0 - .5'	0.25
9761 9-AUG-85	B-6 .5 - 1.5'	< .10
9762 9-AUG-85	B-6 1.5 - 2.5'	0.10
9763 9-AUG-85	B-6 2.5 - 3.5'	0.11
9764 9-AUG-85	B-6 3.5 - 4.5'	< .10

CHROMIUM ANALYSIS ON EP-TOX EXTRACTS

B00

COVINGTON & BURLING
1201 Pennsylvania Avenue, N.W.
P. O. Box 7566
Washington, D.C. 20044-7566

Fax Numbers: 202-662-6291 or 202-737-0528
Fax Operator: 202-662-6280

Please Call 202-662-6280 If There Are Transmission Problems

Leconfield House
Curzon Street
London W1Y8AS England
Tel: 011-44-71-495-5655
Fax: 011-44-71-495-3101

Brussels Office
44 Avenue dos Arts
Brussels 1040 Belgium
Tel: 011-32-2-512-9890
Fax: 011-32-2-502-1598

DATE: June 11, 1996

TO: Robert Kelso

FROM: John T. Smith II

ROOM: 721-E

3 Pages (including cover)

Message:

PLEASE SEE THAT COPIES OF THE ATTACHED ARE DELIVERED TO A. BIAGGI, V. ROSSE AND W. FREY.

John T. Smith II

If there is a transmission problem, please call the number checked below:

___ **(202) 662-6280 (Telecommunications)**

___ **(202) 778-5555**

721-E Room Number

COVINGTON & BURLING
1201 PENNSYLVANIA AVENUE, N. W.
P.O. BOX 7566
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(202) 662-6000

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TELEX: 89-593 (COVLING WSHI
CABLE: COVLING

J.T. SMITH II
DIRECT DIAL NUMBER
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LECONFIELD HOUSE
CURZON STREET
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BRUSSELS CORRESPONDENT OFFICE
44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-512-9890
TELEFAX: 32-2-502-1598

June 11, 1996

BY FACSIMILE AND FIRST CLASS MAIL

Mr. Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Actions
Nevada Division of Environmental Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

Dear Bob:

Thank you for meeting with representatives of the Kerr-McGee Chemical Corporation (KMCC) on June 5, 1996, to discuss completion of a Phase II consent agreement between KMCC and the Division of Environmental Protection (the Division). This letter will confirm that KMCC's management agrees to sign a Phase II Consent Agreement prior to final approval and incorporation of a Workplan for an Environmental Conditions Investigation at its Henderson, Nevada facility based upon the understanding and conditions that we discussed on June 5.

These understandings and conditions are as follows:

1. KMCC will sign an agreement that is substantially the same as the Division's March 26, 1996 draft -- modified in only two respects. First, the Division has agreed to amend Section IV.F. to substitute the language forwarded KMCC on April 29. Second, the Division will modify the first paragraph of Section XVII (Reimbursement of Division Oversight Costs) as set forth in your letter of June 3, 1996 to Joel Mack. The Division will forward KMCC a clean, signature copy of the agreement reflecting these changes.

? IS THIS CORRECT?

2. The Division will not expect KMCC's signature on this Agreement until it receives further information regarding the comments of the Division, its IT contractor and by the City of Henderson. The latter has agreed to review comments of the Division and IT. You have agreed to share with KMCC the materials that you will be forwarding to Henderson. It is the Division's hope to complete the initial review process, including comments by the City of Henderson by June 21, 1996. You have shared with KMCC the preliminary comments of the Division and IT, and have represented that your review to date has not identified any "fundamental" issues. Indeed, you have represented that KMCC's Workplan and the accompanying response to the Letter of Understanding (LOU) appear to be "95%" complete. In the unlikely event that further review turns up any new "fundamental" issues, we have agreed that there will be an opportunity to resolve such issues prior to the time that KMCC would be compelled to sign a Phase II Agreement.

3. Given the importance of the "fundamental" issue concept, we discussed our mutual understanding of this term. A "fundamental" issue is one that would significantly increase the likely scope and cost of KMCC's Phase II obligations. Reasonable requests for more sampling points or analytes would not be deemed "fundamental." In contrast, a requirement to initiate systematic sampling and planning for removal of chromium contaminated soil beneath the production facilities would definitely be considered "fundamental."

4. You have identified only one aspect of the LOU response that may require some expansion of the draft Workplan. It is whether KMCC can fairly be required to do groundwater sampling for additional analytes at the groundwater monitoring wells installed on the J.B. Kelley lease site in an effort to characterize potential environmental impacts from any operations that may have been conducted in that area by a previous tenant, the Hardesty Chemical Company. We have agreed to continue to examine the issue of whether the groundwater monitoring done by KMCC at the Kelley site suffices to demonstrate that no significant contamination occurred as a result of any Hardesty operations.

5. During the period for further review of the Workplan and LOU response, the Division will examine whether documents submitted by KMCC as Attachment 7 to the LOU response regarding residual contamination levels in the old surface impoundments, P-1 and S-1, suffices to demonstrate that "clean closure" has been achieved under the standard of 40 C.F.R. §§ 264.228 and 270.1.

The Division will advise KMCC of its conclusions in this regard before signature of the Phase II Agreement is required.

6. Although it is likely that KMCC will be required to sign the Phase II Agreement before it receives formal comments on the Workplan and LOU Response, the Division will submit such comments in the form of an "approval with conditions" or by other appropriate means -- in contrast to a Notice of Disapproval pursuant to Section VI, which would trigger rigid deadlines and potentially trigger stipulated penalties.

I would appreciate receiving confirmation from you that the Division shares the understandings summarized in this letter. KMCC looks forward to continued constructive cooperation with the Division in carrying out the Phase II process.

Sincerely,

John T. Smith II

cc: Alex Biaggi
Verne Rosse
William Frey
Legal Subcommittee
Susan Stewart

BOB - I WASN'T PART OF THE CONV. SO I HAVE TO RELY ON YOU FOR VERBAL CONTENT. WE WANT TO BE SURE THIS IS CONSISTENT W TALKS W JOEL ET. AL. ALSO POINTS OUT A NEED TO STAY AWAY FROM WORDS SUCH AS "FUNDAMENTALLY" AND "BASICALLY"; THEY USE THEM AGAINST US. WE PROBABLY NEED TO HOLD A TIGHTER LINE.

INTERNATIONAL TECHNOLOGY CORPORATION

June 7, 1996

Project No.: 766408.02010000

Mr. Robert Kelso, P.E.
Bureau of Corrective Actions
Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Review Comments on Kerr-McGee Phase II Work Plan

Dear Mr. Kelso:

I have conducted an in-depth review of the Kerr-McGee Chemical Corporation (KMCC) Phase II Work Plan and my comments are attached.

In general, the plan addresses the primary contaminants of concern and seems to be adequate. However, until the question of selection of block sizing and number of samples required is answered, it cannot be determined if the plan will provide adequate data for decision-making. If the plan is intended only for initial screening to determine if additional characterization or remediation is warranted, then it is generally adequate with the exceptions noted in the attached.

If you have any questions or comments, please call me at 702-794-1717. Thank you for this opportunity to be of service.

Sincerely,

Terre Maize

Terre Maize, CEM
Project Manager

CEM Number EM-1030
Expires: November 12, 1996

LV/6-9-96/G:\KELSO.6A

Regional Office
4330 South Valley View, Suite 114 • Las Vegas, Nevada 89103-4047 • 702-794-1700

1. Section 2.2.2. Is there a statistical basis for the number of samples to be collected? The Work Plan states that "the number of blocks of each area is equal to the number of samples that will be collected in the area," however, there does not appear to be an explanation for how the number of samples for a given area was selected. While the number of samples appears adequate in some areas, it does not appear adequate in others (such as the Trade Effluent Ponds). The Work Plan then goes on to say that each block was overlain by a grid of 100 cells. Again, the basis for using a grid of 100 cells is not explained. Until the basis for the number of samples and grid sizes is explained, it cannot be determined if the number of samples are defensible or adequate. Please note that the stratified random sampling method described is not the issue in question; this sample location rational should be adequate.

2. Section 2.31. Why was the depth of 10 feet chosen for borings? Is this adequate? The Work Plan states that the ponds received solid wastes from 1945 to 1979. While the total metals and soil pH will provide information on liquids placed in the ponds, it is not clear that this is adequate to determine if other constituents from the solid waste disposal practices are present and/or migrating. In addition, while the hazardous waste landfill is undergoing post-closure monitoring, it is not clear whether the proposed suite of analytes is adequate to detect potential migration from the landfill that may have occurred post-closure. It is difficult to determine whether the Work Plan adequate addresses LOU Item 2 to better delineate the poorly defined historic disposal area and to establish the nature of materials deposited therein. If there is a lack of historic process knowledge, then what is the basis for such a limited suite of analytes? Plates 1 and 2 show elevated conductivity and manganese levels in the general vicinity down gradient of the old hazardous waste landfill. Is this from migration of landfill constituents?

3. Section 2.3.6. Why are semivolatiles not constituents of concern? Typically, semivolatile, as well as volatile, organic compounds are used in laboratory processes.

4. Section 2.3.7. Based on review, the JB Kelley, Inc. Trucking Site appears to be at the same location as the old Hardesty/Amecco site. While the Phase I report explains that it is not clear whether Hardesty ever operated, there are potential constituents of concern listed. These include monochlorobenzene, paradichlorobenzene, and soda arsenate solution. The proposed analytical suite of total metals and soil pH may not be adequate to detect other constituents of concern, such as volatile and semivolatile organics. In addition, the suite of analytes does not appear to be adequate to address LOU Item 63; it is not explained why volatile and semivolatile organics and total petroleum hydrocarbons would not be contaminants of concern from vehicle cleaning operations.

5. Response to LOU, Item 5. From the response, it is assumed that no conveyances received waste solely from KMCC. Is this a correct assumption? If not, this needs clarification in the plan.

6. Response to LOU Item 10. While the response is adequate to address the specific LOU concern, the Work Plan does not provide information on what the post-closure monitoring has revealed.

7. Response to LOU Item 11. It is KMCC's opinion that no further characterization is warranted; however, if the state feels that further characterization is warranted, slant or horizontal boring methods could be employed. Without additional information, it is not clear whether this would be a worthwhile effort.

8. Response to LOU Item 35. It is not clear whether there is adequate process knowledge to limit the analytical suite to only those constituents listed in the Work Plan.

9. Response to LOU Item 39; this item will require follow-up since additional analyses are promised.

10. Response to LOU Item 41. This item requries follow-up since additional anlayses are promised.

11. Response to LOU Item 44. In addition to the elevated manganese levels found in groundwater beneath Unit 6, there is also high specific conductivity in the groundwater, presumably from the precipitation process described in the response. Therefore, it appears that the manganese is contributing to the high TDS in the shallow aquifer. This appears contrary to the state of Nevada's nondegredation policy for groundwater.

12. Respone to LOU Item 52. Recommend field verification.

13. Response to LOU Item 59. The Phase I report says that State Industries had previously discharged various constituents to the storm sewer system. This discharge was stopped; however, it is not clear whether contamination resulting from this discharge migrated into the groundwater or vadose zone. Contaminants appear to include volatiles and semivolatiles. The State Industries soil boring report indicates that these constituents are currently present below TCLP regulatory levels on the State Industries property; however, it is not clear whether more highly concentrated contaminants were released into the storm sewer system.

14. Response to LOU Item 68. The Work Plan states that concrete has been placed to provide an area for processing of cars. However, it is not stated whether the existing contamination was removed prior to placing the concrete.

15. The responses imply that the elevated conductivity and high TDS are not items that should be of concern. Does this reflect the state's position also?

6/7/96 Telecon
[BMI]

Barry Sandals, Pat Demps, John Foccomb, Joel Mack
+ more Ken Stevens
S. Biacci, W. Frey, R. Kerso

Blank Check Notion + Field Work Start

Timet → Low Items → Some Answered } Barry Sandals
Field Work to come later

Provide informal comments as quickly as possible

Modify CA to accept delivery w/o Stip Penalties
Similar to RAS Language Re. Penalties

KMCC Mtg. 6/5/96

S. Crowley, Pat Dempsey, Alex Napier, J.T. Smith
V. Rosso, R. Korso, W. Frey

OK w/ RCRA language & oversight costs

Hardesty → Kelley data → nothing further
↳ may not have ever operated.
chemicals from sales brochure.
MW-92 & 93
will check TOC/TOX(H) data from
Hazardous Waste Landfill

KMCC to discuss w/mgmt willingness to commit to signing current agreement @ time in which preliminary comments from IT's Henderson are received and no fundamental issues are raised to significantly alter WP agreements. ~ 21 June 96
response by Tues/Wed → June 11-12
will provide page 26

Look @ Attch 7 and evaluate w/respect to RCRA wording in IV.F.
- provide response.

/Cmee

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

June 3, 1996

MR JOEL H MACK ESQ
LATHAM & WATKINS
701 "B" STREET SUITE 2100
SAN DIEGO CA 92101-8197

Re: Phase II Consent Agreements - RCRA Requirements

Dear Mr. Mack:

Per our recent discussions, the Nevada Division of Environmental Protection reiterates its position that the Phase II Investigations at the BMI Complex provide sufficient information (analytical, technical, etc.) to determine the appropriate course of action, remedial or otherwise, that best protects human health and the environment in the vicinity of the Complex.

This position is also true with respect to potential RCRA sites (known or unknown) within the Complex. In all cases, the data gathering requirements of 40 CFR Parts 264 and 270 are applicable; all options for remedial actions are open for evaluation; and the final selection will be a function of analytical data, economic impacts, legal requirements, and the protection of human health and the environment, among others. It is not the intent of the Division to arbitrarily eliminate any viable option(s) at this time.

With respect to the RCRA provisions of the Phase II Consent Agreement (Section IV(F)), the Division does intend to follow the interpretative pronouncements of the Federal Environmental Protection Agency, in particular, EPA's statement of March 19, 1987 regarding the interpretation of the 'remove and decontaminate' language appearing in § 264.228 (ref. 52 Fed. Reg. 8704, 8706 (1987)).

In addition, your proposed modification to Section E.1 which changes "...received hazardous waste after July 26, 1982, **or** with respect to which closure was certified..." to "...received hazardous waste after July 26, 1982, **and** with respect to which closure was certified..." is unacceptable to the Division. The existing wording is in agreement with 40 CFR §§ 270.1(c).

Paragraph 1, Section XVII (Reimbursement of Division Oversight Costs) has also been modified to read as follows:

> "Following the Effective Date and for the effective period of this Consent Agreement, the Company(ies) shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement in the manner prescribed by Section XVII (Reimbursement of Division Oversight Costs) of the BMI Common Areas Phase 2 Consent Agreement."

Final electronic and hard copy versions will be supplied if these changes are agreeable. If you need additional information or have questions regarding these matters, please contact the undersigned or Mr. Allen Biaggi at (702) 687-4670, extension 3020 or 3021, respectively.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

cc: A. Biaggi, NDEP
W. Frey, Deputy Attorney General
Mr. Barry Conaty, Cutler and Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005
Mr. John D. Edgcomb, 55 Francisco Street, Suite 612, San Francisco, Ca. 94133
Mr. J. T. Smith II, Covington and Burling, P.O. Box 7566, Washington, D.C. 20044
Ms. Susan P. Stewart, TIMET, PO Box 2128, Henderson, Nevada 89009

COVINGTON & BURLING
1201 PENNSYLVANIA AVENUE, N. W.
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BRUSSELS CORRESPONDENT OFFICE
44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-512-9890
TELEFAX: 32-2-502-1598

J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

May 24, 1996

BY FACSIMILE AND REGULAR MAIL

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Action
Nevada Division of Environmental
Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

Dear Bob:

Thank you for sending me a copy of your May 21, 1996 letter to Joel Mack. As I have mentioned in our phone conversations, Kerr McGee's principal concern with the RCRA language in the proposed Phase II consent agreement is that it might trigger RCRA permitting, which, in turn, could compel facility-wide corrective action under RCRA. This outcome could result if NDEP were to determine that Kerr McGee had not met the standards for "closure by removal or decontamination in § 264.228." See, 40 CFR §270.1(c)(5).

As we have discussed, EPA has issued an interpretation of the terms "remove" and "decontaminate" as they appear in §264.228. I sent you a copy of EPA's interpretation on May 22, 1996. It is our position that any reference in the Consent Agreement to this regulatory standard should be understood to include EPA's authoritative interpretation of the standard.

In this regard, Kerr McGee urges an amendment to your draft letter to include the following language after the second paragraph.

"The Division confirms that it intends to construe and apply the RCRA provisions cited in § IV(F) of the Phase II Agreement in a manner consistent with authoritative interpretative pronouncements by the Federal Environmental Protection Agency and, in particular, EPA's statement of March 19, 1987 regarding the interpretation of the 'remove and decontaminate' language appearing in § 264.228. See, 52 Fed. Reg. 8704, 8706 (1987)."

Inclusion of the above language in your letter and amendment of the March 26, 1996 draft of the proposed Consent Agreement along the lines suggested by the Division on April 29, 1996 should assuage much of Kerr McGee's concern about §IV(F). Also, it is our understanding from extensive telephone discussions with you and other representatives of the Division during the past month that the Division shares our objective of avoiding measures that would trigger RCRA corrective action in manner that would interfere with orderly completion of the consent process under which we have been proceeding.

Sincerely,

John T. Smith II

cc: Joel Mack
Susan Stewart

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1201 PENNSYLVANIA AVENUE, N. W.
P.O. BOX 7566
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44 AVENUE DES ARTS
BRUSSELS 1040 BELGIUM
TELEPHONE: 32-2-512-9890
TELEFAX: 32-2-502-1598

J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

May 23, 1996

VIA FACSIMILE

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Action
Nevada Division of Environmental
Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

Dear Bob:

As you are aware, Kerr McGee Chemical Corporation (KMCC) has submitted a Response to the August 1994 Letter of Understanding (LOU) and a draft Phase II ECI Workplan for its facility, in Henderson, Nevada. Under separate cover, this week KMCC is submitting a proposed schedule for execution of this workplan. KMCC proposes that the Phase II Workplan be appended to any Phase II Consent Agreement (the "Agreement") in lieu of the ECI guidance document referred to at lines 18-19 of page 12 of the Agreement.

Apart from completion of review of KMCC's Phase II Workplan, two other matters remain for clarification before KMCC will be in a position to execute the Phase II Agreement. We have discussed these issues informally in phone conversations over the past few weeks.

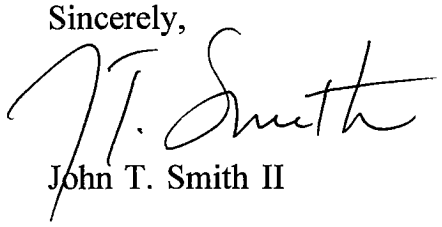
The first issue relates to the language of Section XVII on Nevada's oversight costs. We have suggested eliminating paragraph 1 of this Section. NDEP has made a counter suggestion on the phone which sounded promising, but as yet we have not seen this amendment in writing.

More significant is the language you have proposed as Section IV.F. addressing potential application of RCRA at the KMCC facility. We have discussed the language extensively, as well as an alternative draft forwarded us on

April 29, 1996. Satisfactory resolution of the issues posed should be achieved before execution of any Phase II Agreement.

It is my understanding from our telephone discussion of May 21, 1996, that you will be sending us a draft letter elaborating the purpose and practical effect of this language. We will review this letter promptly and will contact you with further comments or questions, as appropriate.

Sincerely,



John T. Smith II

cc: Joel Mack
Susan Stewart

INTERNATIONAL TECHNOLOGY CORPORATION

May 23, 1996

Project No.: 766408.02010000

Mr. Robert Kelso, P.E.
Bureau of Corrective Actions
Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Review Comments on Kerr-McGee Phase II Work Plan

Dear Mr. Kelso:

I have reviewed the Kerr-McGee Chemical Corporation (KMCC) Phase II Work Plan and have the following comments:

1. Section 2.2.2. How were the block and grid sizes selected? Is there a statistical basis or is the number based strictly on the ability to achieve blocks of equal size?

2. Section 2.3.6. Why are semivolatiles not constituents of concern?

3. Response to LOU, Item 5. From the response, it is assumed that no conveyances received waste solely from KMCC. Is this a correct assumption?

In general, the plan seems adequate to provide data which will assist in determining whether further characterization or remedial action is required.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations, and ordinances.

Regional Office
4330 South Valley View, Suite 114 • Las Vegas, Nevada 89103-4047 • 702-794-1700

If you have any questions or comments, please call me at 702-794-1717. Thank you for this opportunity to be of service.

Sincerely,

Terre Maize

Terre Maize, CEM
Project Manager

CEM Number EM-1030
Expires: November 12, 1996

LV/5-23-96/G:\KELSO.5B

305

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

May 23, 1996

Mr. Allan Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89710

Subject: Phase II Work Plan - Schedule of Work

Dear Mr. Biaggi:

Earlier this month Kerr-McGee Chemical Corporation (KMCC) submitted a draft of their Phase II Work Plan, which supplements KMCC's response to the August 15, 1994, Letter of Understanding (LOU) between KMCC and the Nevada Division of Environmental Protection (NDEP). The attached schedule contains information related to the Phase II Work Plan's field activities and report generation. It should be inserted into KMCC's Phase II Work Plan as Page 4-2 in the Project Management Plan. In addition, Section 4.2 of the Work Plan will be rewritten to read:

> "After NDEP approval of this Work Plan, but not sooner than September 15, 1996, implementation of the work described in Section 2 will begin. Work will be completed as scheduled in Table 7a."

Again, KMCC is anticipating receipt of NDEP comments on the Phase II Work Plan prior to our finalizing the Consent Agreement. We believe that this will help expedite the overall process by focusing the Consent Agreement on a defined scope of work. Your assistance in this matter is appreciated.

If you have any questions, please feel free to contact me at (702) 651-2234.

Sincerely,

Susan Crowley

Susan Crowley
Staff Environmental Specialist

smc\WPCOV01.WPD
cc: PSCorbett
RANapier
RHJones
PRDemps

TABLE 7b
Work Schedule

Task Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Task 1																	
Work Plan Approval by NDEP[1]																	
Mobilization																	
Field Activities																	
Laboratory Analysis																	
Task 2																	
Data Validation																	
Draft Report Preparation																	
KMCC Review																	
Final Report Preparation and Submittal to NDEP																	

[1] : Field activities will not begin prior to September 15, 1996, even if approval is received before this date.

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J.T. SMITH II
DIRECT DIAL NUMBER
(202) 662-5555

May 22, 1996

VIA FACSIMILE

Robert C. Kelso
Supervisor, Remediation Branch
Bureau of Corrective Action
Nevada Division of Environmental
Protection
Capitol Complex
333 W. Nye Lane
Carson City, NV 89710

Dear Bob:

Attached as we discussed is a copy of EPA's 1987 rule on closure of interim status surface impoundments under RCRA. At 52 Fed. Reg. 8,706, it articulates the Agency's interpretation of the "remove and decontaminate" standard for "clean closure."

If KMCC is to agree to your suggested language at Section IV.F.2 of the Phase II Agreement, it will need some assurance that "removal or decontamination" will be construed by Nevada in a manner consistent with EPA's interpretation of this same language entailing site-specific evaluation of risk.

Sincerely,

John T. Smith II

Attachment

cc: Joel Mack
Pat Demps
John D. Edgcomb

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 265

[SW-FRL-3092-1]

Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Final Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Acency is today amending the interim status regulations for closing and providing postclosure care for hazardous waste surface impoundments (40 CFR Part 265, Subpart K), under the Resource Conservation and Recovery Act (RCRA).

The Agency proposed today's modifications to the interim status standards on July 26, 1982. Today's amendments provide conformance between certain interim status requirements for surface impoundments and those requirements contained in the permitting rules of 40 CFR Part 264, that were also published on July 26, 1982. The Agency is also setting forth its interpretation of the regulatory requirements applying to closure of storage facilities regulated under both permits and interim status.

EFFECTIVE DATE: These final regulations become effective on September 15, 1987, which is six months from the date of promulgation, as RCRA section 3010(b) requires.

ADDRESS: The docket for this rulemaking (Docket No. F-87-CCFF-FFFFF) is located in Room MLG100, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC and is available for viewing from 9:00 a.m. to 3:30 p.m., Monday through Friday, excluding holidays. Call Mia Zmud at 475-9327 for appointments.

FOR FURTHER INFORMATION CONTACT: RCRA hotline at (800) 424-9346 (in Washington, DC, Call 382-3000) or for technical information contact Ossi Meyn, Office of Solid Waste (WH-565E), U.S. Environmental Protection Agency, Washington, DC 20460, telephone (202) 382-4654.

SUPPLEMENTARY INFORMATION:

I. Authority

These regulations are issued under the authority of sections 1006, 2002(a), 3004 and 3005 of the Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, as amended (42 U.S.C 6905, 6912(a), 6924, and 6925).

II. Background

Subtitle C of RCRA creates a "cradle-to-grave" management system intended to ensure that hazardous waste is safely treated, stored, or disposed. First, Subtitle C requires the Agency to identify hazardous waste. Second, it creates a manifest system designed to track the movement of hazardous waste, and requires hazardous waste generators and transporters to employ appropriate management practices as well as procedures to ensure the effective operation of the manifest system. Third, owners and operators of treatment, storage, and disposal facilities must comply with standards the Agency established under section 3004 of RCRA that "may be necessary to protect human health and the environment." Ultimately, these standards will be implemented exclusively through permits issued to owners and operators by authorized States or the Agency. However, until these permits are issued, existing facilities are controlled under the interim status regulations of 40 CFR Part 265 that were largely promulgated on May 19, 1980. Under RCRA interim status, the owner or operator of a facility may operate without a permit if: (1) It existed on November 19, 1980, (or it existed on the effective date of statutory or regulatory changes under RCRA that render the facility subject to the requirements to have a permit under section 3005); (2) he has complied with the notification requirements of section 3010 of RCRA; (3) he applied for a permit (Part A application) in accordance with section 3005 of RCRA. Interim status is retained until the regulatory agency makes a formal decision to issue or deny the permit or until the facility loses its interim status by statute for failure to submit Part B permit application and/or certification of compliance with applicable ground-water monitoring and financial assurance requirements.

In regulations promulgated on July 26, 1982, [40 CFR Part 264, 47 FR 32274], the Agency established permitting standards in 40 CFR Part 264 covering the treatment, storage, and disposal of hazardous wastes in surface impoundments, waste piles, land treatment units, and landfills. Owners and operators of such facilities must meet these standards to receive RCRA permits. Also included in the Federal Register on that date were a series of changes to the interim status requirements of Part 265, which were promulgated to ensure consistency with the new Part 264 standards. There were, however, a few additional Part 265 conforming changes that the Agency believed should first be proposed for public comment because, in most cases, the public had not had sufficient opportunity to comment on the appropriateness of applying them during the interim status period. Many of the changes that were proposed on July 26, 1982, were promulgated in final regulations on April 23, 1985 (50 FR 16044). Today, the Agency is making final the remaining changes to the surface impoundment closure and post-closure care requirements (§ 265.228) that were proposed on July 26, 1982.

III. Discussion of Today's Amendments

The Part 264 rules issued on July 26, 1982, for surface impoundment closure and post-closure care (§§ 264.228 and 264.310) are in many ways similar to the interim status requirements (§§ 265.228 and 265.310). The Part 264 closure rules, however, contain more specific performance standards to assure adequate protection of human health and the environment. For reasons discussed below, the Agency believes the more explicit Part 264 closure rules should also be implemented during interim status. Moreover, EPA believes that the closure process is adequate to apply these closure requirements. The existing review process for interim status closure and post-closure care plans will provide an opportunity for the Agency to review the specifics of the plans for compliance with the closure performance standards. Thus, any problems with misinterpretation of the closure requirements by the owner or operator would be identified and rectified prior to actual closure. In fact, the review process for closure and post-closure care plans during interim status is similar to the review process of closure and post-closure care plans conducted during the permitting process. Therefore, the Agency believes that these closure requirements are capable of being properly implemented during interim status.

The § 265.228 closure rules proposed on July 26, 1982, and promulgated today, retain the basic format of existing regulations by allowing owners and operators to choose between removing hazardous wastes and waste residues (and terminating responsibility for the unit) or retaining wastes and managing the unit as a landfill. (An additional choice for closure is proposed elsewhere in today's Federal Register.) The requirements for both choices are made more specific in today's amendments.

If the owner or operator chooses not to remove or decontaminate the waste and waste residues, then the rules promulgated today provide that the owner or operator must: (1) Eliminate free liquids by either removing them from the impoundment or solidifying them, (2) stabilize the remaining waste and waste residues to support a final cover, (3) install a final cover to provide long-term minimization of infiltration into the closed impoundment, and (4) perform post-closure care and ground-water monitoring.

The Part 265 regulations promulgated today (like the existing Part 264 regulations for permitted units) allow owners and operators of surface impoundments to remove or decontaminate wastes to avoid capping and post-closure care requirements (§ 265.228(a)(1)). They must remove or decontaminate all wastes, waste residues, contaminated containment system components (e.g., contaminated portions of liners), contaminated subsoils, and structures and equipment contaminated with waste and leachate. All removed residues, subsoils, and equipment must be managed as hazardous waste unless there is compliance with the delisting provisions of § 261.3(d). (Similar Part 265 closure and post-closure care rules for waste piles were promulgated on July 26, 1982.)

The new requirements for closure by removal differ significantly from the previous Part 265 requirements in one respect. The previous interim status requirement in § 265.228(b) required owners or operators to remove all waste residuals and contaminated soil or to demonstrate, using the procedures in § 261.3 (c) and (d), that the materials remaining at any stage of the removal were no longer a hazardous waste. Once an owner or operator made a successful demonstration under § 261.3 (c) and (d), (s)he could discontinue removal and certify closure.

Under § 261.3 (c) and (d), materials contaminated with listed waste (as evidenced by the presence of Appendix VIII constituents) are hazardous waste by definition unless the material is delisted. Materials contaminated with characteristic wastes, however, are only hazardous wastes to the extent that the material itself exhibits a characteristic. Thus to meet the old closure by removal standard, owners or operators of characteristic waste impoundments had only to demonstrate that the remaining material did not exhibit the characteristic that first brought the impoundment under regulatory control.

This demonstration, however, arguably allowed significant and potentially harmful levels of hazardous constituents (i.e., those contained in Appendix VIII of Part 261) to remain in surface impoundment units without subjecting the units to landfill closure, post-closure care, or monitoring requirements.

For example, the previous version of the rule allowed residues from waste that originally exhibited the characteristic of extraction procedure (EP) toxicity to remain in place at "clean closure" if the residue was no longer EP toxic. This could allow an environmentally significant quantity of hazardous constituents to remain at a facility site that will receive no further monitoring or management. While EP toxic criterion would preclude only a concentration that exceeds 100 times the drinking water standard, constituents may remain at levels significantly above the drinking water standards. If such constituents are close to the saturated zone, they may contaminate ground water at levels exceeding the ground-water protection standard. Furthermore, the waste residues may contain significant and potentially harmful levels of other hazardous constituents (listed in Appendix VIII of Part 261) that are not found through EP testing. Hence, the language "or demonstrate what remains is no longer a hazardous waste" has been dropped from the interim status regulations because it is inconsistent with the overall closure performance standard requiring units to close in a manner that eliminates or minimizes the post-closure escape of Appendix VIII constituents.

Making this conforming change ensures that no Appendix VIII constituent presents any threat to human health and the environment. This is also consistent with several of the new requirements added by the Hazardous and Solid Waste Amendments of 1984. For example, new section 3004(u) of RCRA requires corrective action for releases not only of hazardous wastes, but also hazardous constituents. Similarly, section 3001(f) requires the Agency to consider, when evaluating waste delisting petitions, all hazardous constituents found in the waste, not just those for which the waste was listed as hazardous. Finally, new section 3005(j) requires owners and operators of landfills, surface impoundments, waste piles, or land treatment units that qualify for interim status and receive waste after July 26, 1982, to meet the ground-water monitoring and corrective action standards found in Subpart F to 40 CFR Part 264. These regulations also require owners and operators to monitor and clean up the full range of Appendix VIII constituents found in a waste.

The question has also arisen during the implementation of previous closures by removal whether § 265.228 requires consideration of potential ground-water contamination in addition to soil contamination. The answer to this question is yes. The closure by removal requirements in § 265.228 (a)(1) and (b) require removal or decontamination (i.e. flushing, pumping/treating the aquifer) of "underlying and surrounding contaminated soils." Since contamination of both saturated and unsaturated soils may threaten human health or the environment, the Agency interprets the term "soil" broadly to include both unsaturated soils and soils containing ground water. Thus the closure by removal standard requires consideration of both saturated and unsaturated soils. Uncontaminated ground water is, therefore, a requirement for "clean closure" under Part 265 (and Part 264) as revised today as well as under the previous regulation.

The one comment received on the proposed § 265.228 surface impoundment closure and post-closure care requirements for "clean closure" argued that clay liners should be allowed to remain in place at closure even if they are contaminated because their excavation is expensive and hazardous to workers removing the waste. EPA disagrees. While excavation may be expensive, the additional cost of removing the liner will usually be small in comparison to the cost of removing the waste. Therefore, if an owner or operator is willing to expend the resources to remove the waste, it is not unduly burdensome to go one step further and remove the liner. This burden is justified by the benefit of removing contamination from the impoundment. (See discussion below.) If extensive excavation is needed, thereby considerably increasing the cost of removal, it is generally because extensive contamination of the clay and underlying soils has occurred. In these cases, it may be cheaper to install a proper final cover and perform post-closure care rather than remove the contamination. In addition, we do not believe that removal of the liner will be any more hazardous to workers than is the removal of the waste. With proper safety procedures, removal of the waste and liner should not pose an undue hazard to workers.

EPA's Interpretation of the "Remove or Decontaminate" Standard

The sole commenter on the proposed rule also suggested that, in addition to the case where all wastes, residues, and contaminated liners and soils are

removed, no final cover should be required where the type and quantity of waste in the liner can be shown to pose no public health or environmental threat. This comment touches upon an issue that has arisen in other contexts, that is: What is the necessary extent of removal or decontamination of wastes, waste residues, contaminated liners, and soils (including contaminated ground water) to avoid the landfill closure and post-closure care requirements under both Parts 264 and 265 regulations? The issue concerning how much removal or decontamination of wastes and waste residues is necessary to protect human health and the environment is relevant in a broad range of regulatory contexts currently being examined by the Agency including closure and corrective actions under RCRA and response actions under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) programs.

The removal and decontamination issue arises directly from differences in regulatory strategy between disposal and storage. A storage unit holds wastes temporarily, and the wastes are eventually removed for treatment or disposal elsewhere. The goal at closure is to leave no materials at the storage site that require further care. In contrast, a disposal unit, by definition, is closed with wastes and residues remaining at the site. The goal at closure is to assure that these remaining wastes and residues are managed in a manner that protects human health and the environment. There is no need for post-closure oversight of storage units since all potentially harmful wastes and contaminated materials are removed. This is not true for disposal units; hence, the Agency has promulgated regulations requiring post-closure care for disposal units. (For further discussions on a proposed alternative closure option, see the preamble to proposed §§ 264.310 and 265.310 elsewhere in today's Federal Register).

To assist the reader, we describe below EPA's interpretation of the "remove and decontaminate" language in §§ 264.228 and 265.228, i.e., we describe the amount of removal or decontamination that obviates the need for post-closure care for both interim status and permitted surface impoundment units. With regard to storage units regulated under both Parts 264 and 265, the Agency interprets the terms "remove" and "decontaminate" to mean removal of all wastes and liners, and the removal of leachate and materials contaminated with the waste or leachate (including ground water) that pose a substantial present or potential threat to human health or the environment. The Agency recognizes that at certain sites limited quantities of hazardous constituents might remain in the subsoil and yet present only insignificant risks to human health and the environment. Because regulations for storage facilities require no further post-closure care, the Agency must be certain that no hazardous constituents remain that could harm human health or the environment (now or in the future). To provide the necessary level of assurance, the Agency will require owners or operators to remove all wastes and contaminated liners and to demonstrate that any hazardous constituents left in the subsoils will not cause unacceptable risks to human health or the environment. The Agency will review site-specific demonstrations submitted by facility owners and operators that document that enough removal and decontamination has occurred so that no further action is necessary. Owners or operators wishing to avail themselves of the site-specific removal option must include in their closure plans specific details of how they expect to make the demonstration, including sampling protocols, schedules, and the exposure level that is intended to be used as a standard for assessing whether removal or decontamination is achieved (see discussion below). The Agency is presently developing a guidance document explaining the technical requirements for achieving a "clean closure". This guidance document should be available in draft form by January 1987. In the meantime, the following discussion presents the framework for the demonstration procedure.

The closure demonstrations submitted by facility owners and operators must document that the contaminants left in the subsoils will not impact any environmental media including ground water, surface water, or the atmosphere in excess of Agency-recommended limits or factors; and that direct contact through dermal exposure, inhalation, or ingestion will not result in a threat to human health or the environment. Agency recommended limits or factors are those that have undergone peer review by the Agency. At the present time these include water quality standards and criteria (Ambient Water Quality Criteria 45 FR 79318, November 28, 1980; 49 FR 5831, February 15, 1984; 50 FR 30784, July 29, 1985), health-based limits based on verified reference doses (RfDs) developed by the Agency's Risk Assessment Forum (Verified Reference Doses of USEPA, ECAO-CIN-475, January 1986) and Carcinogenic Potency Factors (CPF) developed by the Agency's Carcinogen Assessment Group (Table 9-11, Health Assessment Document for Tetrachloroethylene (Perchloroethylene) USEPA, OHEA/600/8-82/005F, July 1985) to be used to determine exposure at a given risk, or site-specific Agency-approved public health advisories issued by the Agency for Toxic Substance and Disease Registry of the Center for Disease Control, Department of Health and Human Services.

The Agency is currently compiling toxicity information on many of the hazardous constituents contained in Appendix VIII to Part 261. The facility owner and operators should check with the Office of Solid Waste, Characterization and Assessment Division, Technical Assessment Branch (202) 382-4761 for the latest toxicity information. However, for some hazardous constituents, formally recommended exposure limits do not yet exist. If no Agency recommended exposure limits exist for a hazardous constituent then the owner or operator must either remove the constituent down to background levels, submit data of sufficient quality for the Agency to determine the environmental and health effects of the constituent, or follow landfill closure and post-closure requirements. Data submitted by the owner or operator on environmental and health effects of a constituent should, when possible, follow the toxicity testing guidelines of 40 CFR Parts 797 and 798 (50 FR 39252, September 27, 1985). The Agency does not believe there are many situations where developing exposure levels will be a realistic option for owners and operators because the testing required by 40 CFR Parts 797 and 798 to produce reliable toxicity estimates is expensive and time-consuming.

The Agency believes it is necessary to present policy on the appropriate point of exposure for the various pathways of exposure in order to provide some national consistency in dealing with the potential impacts of the release of hazardous constituents from closing units. The following point of exposure was chosen because the Agency believes it represents a realistic and at the same time reasonably conservative estimate of where either environmental or human receptors could be exposed to the contaminants released from the unit. For the purpose of making a closure by removal demonstration, the potential point of exposure to hazardous waste constituents is assumed to be directly at or within the unit boundary for all

routes of exposure (surface-water contact, ground-water ingestion, inhalation, and direct contact). Potential exposure at or within the unit boundary must be assumed because no further oversight or monitoring of the unit is required if the unit is closed by removal. (Recall that the land overlying a unit that closes by removal may be transferred and developed freely without giving notice of its prior use.). Therefore, no attenuation of the hazardous waste constituents leaching from the waste residues can be presumed to occur before the constituents reach exposure points.

This approach differs from the existing "delisting procedure" developed in response to the requirements of §§ 261.3 (c) and (d), 260.20, and 260.22. As discussed previously, the "clean closure" approach is based on the premise that, after closure by removal is satisfied, no further management control over the waste (or unit) is necessary. In contrast, delisted solid waste remains subject to the regulatory controls promulgated by the Agency under Subtitle D of RCRA. Subtitle D contains performance criteria for the management of non-hazardous waste. Although the Agency is currently assessing whether more specific Federal regulatory requirements are needed for waste management under Subtitle D, most states have already adopted specific regulatory requirements for Subtitle D waste management. Therefore, even though a waste may be delisted its management continues to be controlled. In contrast, closure by removal will not be followed by any regulatory controls; hence, an environmentally conservative approach is needed to assure no further risk to human health and the environment. Therefore, unlike the current "delisting procedure" that is based on a generic process that only considers the ground-water route of exposure, the demonstration procedure discussed here is waste-specific and site-specific, considers all potential exposure pathways, and assumes no attenuation.

The demonstration should be conservative in the sense that it eliminates the uncertainties associated with contaminant fate and transport, focusing on the waste contaminant levels and contaminant characteristics. Therefore, arguments relying on fate and transport calculations will not be accepted. The Agency is pursuing this relatively conservative approach at this time because we are confident that it will be protective of human health and the environment. After a few years of experience with "clean closure" demonstrations, the Agency may decide that a less stringent approach is sufficiently reliable to assure that closures based on such analyses are fully protective of human health and the environment. At that time, the Agency may change its position on the use of fate and transport arguments for "clean closure" demonstrations. (Elsewhere in today's Federal Register, the Agency is proposing a third closure option that would incorporate fate and transport factors. However, unlike the closure by removal option, that option would require closure to be followed by verification monitoring to verify the fate and transport predictions and assume that the closure protects human health and the environment.)

To make the demonstration with respect to the direct contact pathway, owners or operators must demonstrate that contaminant levels in soil are less than levels established by the Agency as acceptable for ingestion or dermal contact. Total waste constituent levels in soil should be used for this analysis. Arguments based on exposure control measures such as fencing or capping will not be acceptable since the long-term future use of the property cannot be reliably controlled and hence the long-term effectiveness of these measures is uncertain.

To make the demonstration with respect to the ground-water pathway, owners or operators must remove enough contaminated soil and saturated subsoils (i.e., ground water) to demonstrate that constituent levels in ground water do not exceed Agency-established chronic health levels (based on Rfd or CPF values) and that residual contaminant levels remaining in the soil will not contribute to any future contamination of ground water. (Note: this demonstration may in some cases require constituent-specific ground water data beyond that required by §§ 265.90 through 265.100). The demonstration related to residual soil contamination levels must show that levels of constituents found in leachate from the residual soil contamination are not above Agency-established exposure levels. Levels of constituents in leachate may be estimated based on known characteristics of the waste constituents (e.g., solubility and partitioning coefficients) or determined by the results of actual soil leaching tests. The Agency is exploring the appropriateness of using the extraction procedures (but not the acceptable contaminant levels) found in the Toxicity Characteristics Leaching Procedure (TCLP), Federal Register of January 14, 1985 (51 FR 1690). The current EP Toxicity leaching procedure is insufficient for this demonstration because it does not capture the organic constituents in the waste.

The analysis of potential air exposures should assess contaminants migrating from the soils into the atmosphere. The demonstration should include emission calculations, available monitoring data, and safe inhalation levels based on Agency-established exposure levels.

The potential surface water exposure analysis should compare Agency-established water quality standards and criteria (45 *FR* 79318, November 28, 1980) with the levels of constituents that may leach from the residual contaminated soil. Tests described previously should be used to estimate the level of constituents in the leachate. The surface water exposure analysis should also consider existing surface water contaminant concentrations.

IV. State Authority

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR Part 271 for the standards and requirements for authorization.) Following authorization, the Agency retains enforcement authority under sections 3008, 7003 and 3013 of RCRA, although authorized States have primary enforcement responsibility.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final authorization administered its hazardous waste program entirely in lieu of the Federal program. The Federal requirements no longer applied in the authorized State, and the Agency could not issue permits for any facilities in a State where the State was authorized to permit. When new, more stringent Federal requirements were promulgated or enacted, the State was obligated to enact equivalent authority within specified time frames. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

In contrast, under section 3006(g) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by HSWA take effect in authorized States at the same time that they take effect in nonauthorized States. The Agency is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted

authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, the HSWA applies in authorized States in the interim.

B. Effect on State Authorization

Today's rule promulgates standards that are not effective in authorized States since the requirements are not being imposed pursuant to Hazardous and Solid Waste Amendments of 1984. Thus, the requirements will be applicable only in those States that do not have final authorization. In authorized States, the requirements will not be applicable until the State revises its program to adopt equivalent requirements under State law.

40 CFR 271.21(e)(2) requires that States that have final authorization must modify their programs to reflect Federal program changes and must subsequently submit the modification to EPA for approval. The deadline by which the State must modify its program to adopt today's rule is July 1988. These deadlines can be extended in exceptional cases [40 CFR 271.21(e)(3)]. Once EPA approves the revision, the State requirements become Subtitle C RCRA requirements.

States with authorized RCRA programs may already have requirements similar to those in today's rule. These State requirements have not been assessed against the Federal regulations being promulgated today to determine whether they meet the tests for authorization. Thus, a State is not authorized to carry out these requirements in lieu of the Agency until the State requirements are approved. Of course, States with existing standards may continue to administer and enforce their standards as a matter of State law.

States that submit official applications for final authorization less than 12 months after the effective date of these standards are not required to include standards equivalent to these standards in their application. However, the State must modify its program by the deadlines set forth in § 271.21(e). States that submit official applications for final authorization 12 months after the effective date of those standards must include standards equivalent to these standards in their application. 40 CFR 271.3 sets forth the requirements a State must meet when submitting its final authorization application.

V. Effective Date

Pursuant to section 3010(b) of RCRA, today's amendments will be effective six months after promulgation.

VI. Regulatory Impact

Under Executive Order 12291, the Agency must judge whether a regulation is "major" and, therefore, subject to the requirement of a Regulatory Impact Analysis. As stated in the proposed rule on July 26, 1982, the Agency does not believe these conforming changes will result in an annual effect on the economy of $100 million or more; a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or significant adverse effects on competition, employment, investment, productivity, innovation, or in domestic or export markets. In addition, the Part 265 conforming changes do not impose any requirements beyond those required for permitting facilities under Part 264. Therefore, the Agency believes that today's rule is not a major rule under Executive Order 12291.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291.

VII. Regulatory Flexibility Act

Under the Regulatory Flexibility Act, (5 U.S.C. 601 *et seq.*), the Agency must prepare a regulatory flexibility analysis for all regulations that may have a significant impact on a substantial number of small entities. The Agency conducted such an analysis on the land disposal regulations and published a summary of the results in the Federal Register, Vol. 48, No. 15 on January 21, 1983. Today's conforming regulation does not impose significant additional burdens. In addition, they do not impose any requirements beyond those required for permitting facilities under Part 264.

VIII. Paperwork Reduction Act

The certification requirements contained in this rule have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* and have been assigned OMB control number 2050-0008.

List of Subjects in 40 CFR Part 265

Hazardous materials, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Surety bonds, Waste treatment and disposal, Water supply.

Dated: March 8, 1987.

Lee M. Thomas,

Administrator.

For the reasons set out in the preamble, Part 265, Subpart K of Title 40 of the Code of Federal Regulations is amended as follows:

PART 265—INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

1. The authority citation for Part 265 continues to read as follows:

Authority: Secs. 1006, 2002(a), 3004, and 3005 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended [42 U.S.C. 6905, 6912(a), 6924, and 6925].

2. In 40 CFR Part 265, Subpart K, § 265.228 is revised to read as follows:

§ 265.228 Closure and post-closure care.

(a) At closure, the owner or operator must:

(1) Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless § 261.3(d) of this chapter applies; or

(2) Close the impoundment and provide post-closure care for a landfill under Subpart G and § 265.310, including the following:

(i) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;

(ii) Stabilize remaining wastes to a bearing capacity sufficient to support the final cover; and

(iii) Cover the surface impoundment with a final cover designed and constructed to:

(A) Provide long-term minimization of the migration of liquids through the closed impoundment;

(B) Function with minimum maintenance;

(C) Promote drainage and minimize erosion or abrasion of the cover;

(D) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(E) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) In addition to the requirements of Subpart G, and § 265.310, during the post-closure care period, the owner or operator of a surface impoundment in which wastes, waste residues, or contaminated materials remain after closure in accordance with the provisions of paragraph (a)(2) of this section must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as

necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of Subpart F of this part; and

(3) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

[FR Doc. 87-5575 Filed 3-18-87; 8:45 am]
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COVINGTON & BURLING
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Fax: 011-44-71-495-3101

Brussels Office
44 Avenue des Arts
Brussels 1040 Belgium
Tel: 011-32-2-512-9890
Fax: 011-32-2-502-1598

DATE: May 22, 1996

TO: Robert Kelso

FROM: John T. Smith II

ROOM: 721-E

8 Pages (including cover)

Message:

PLEASE SEE THE ATTACHED.

John T. Smith II

If there is a transmission problem, please call the number checked below:

___ (202) 662-6280 **(Telecommunications)**

___ (202) 778-5555

721-E **Room Number**

PETER G. MORROS, Director
L.H. DODGION, *Administrator*
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Mining Regulation and Reclamation
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Facsimile 687-5856
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STATE OF NEVADA
BOB MILLER
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Waste Management
Corrective Actions
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Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

May 16, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: KMCC Phase II Documents - Work Plan and Response to Letter of Understanding

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has received copies of the subject documents and begun the appropriate distribution for technical review. The Division is aware of your desire to include an approved Work Plan in the signed Consent Agreement, and will move forward with its review and evaluation as rapidly as possible. I must reiterate, however, that the Division still believes the Consent Agreement (CA) has priority, and that the lack of an approved Work Plan is insufficient justification for not reaching agreement on the CA.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021, respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso, P.E.
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

cc: A. Biaggi, NDEP
W. Frey, NDAG
Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

PETER G. MORROS, Director

L.H. DODGION, *Administrator*

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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
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Located at:
333 W. Nye Lane
Carson City, NV 89710

May 14, 1996

MR BARRY CONATY ESQ
CUTLER & STANFIELD
700 FOURTEENTH STREET NW
WASHINGTON DC 20005

Subject: KMCC Phase II Documentation Submittal

Dear Barry:

Attached for your review and comment are KMCC's Phase II Work Plan and a response to the Letter of Understanding. I am also including my letter to KMCC acknowledging receipt and reiterating the Division's position regarding inclusion of the Work Plan in the Consent Agreement. Please provide a projected review schedule as soon as possible.

If you have any questions or I may be of further assistance, please contact me at (702) 687-4670, extensions 3020.

Sincerely,

[redacted]
Supervisor, Remediation Branch
Bureau of Corrective Actions

RCK:kmf

Enclosure

cc: A. Biaggi

Consent Agreement Terms
4/29/96

J.T. Smith, John Edgcomb, A. Biaggi, B. Wells
Jack Mack

KMCC - former interim status land-fill
clean-closed ponds

1982 Rule - cleanup to no detectable limits
(risk-based closure now?)

* Will review and get back with rewording

Do work as if required rather than
actually required.

E. NEVADA HAZARDOUS WASTE DISPOSAL LAW COMPLIANCE

1. For purposes of this Section IV.F, the terms "hazardous constituent," "hazardous waste," "landfill," "land treatment unit," "pile" and "surface impoundment" shall have the meanings specified in 40 C.F.R. § 260.10, each as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632. The term "Subject Unit" means each landfill, land treatment unit, surface impoundment, or waste pile unit located at the Site which received hazardous waste after July 26, 1982, or with respect to which closure was certified pursuant to 40 C.F.R. § 265.115, as adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632, after January 26, 1983.

2. With respect to each Study Item which also is a Subject Unit that was closed by removal or decontamination, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1 such tasks as are necessary to demonstrate that the closure met the standard for closure by removal or decontamination in 40 C.F.R. §§ 264.228, 264.280(e), or 264.258, as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

3. With respect to each Study Item which also is a Subject Unit that was not closed by removal or decontamination in accordance with the standard specified in the preceding Paragraph 2, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1 such tasks as are necessary to develop the groundwater monitoring and hazardous constituent release characterization information specified in Subpart F of 40 C.F.R. Part 264 and 40 C.F.R. § 270.14(c), as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

Jeff, Any additional comments?

Looks OK to me

Bob

E. NEVADA HAZARDOUS WASTE DISPOSAL LAW COMPLIANCE

1. For purposes of this Section IV.F, the terms "hazardous constituent," "hazardous waste," "landfill," "land treatment unit," "pile" and "surface impoundment" shall have the meanings specified in 40 C.F.R. § 260.10, each as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632. The term "Subject Unit" means each landfill, land treatment unit, surface impoundment, or waste pile unit located at the Site which received hazardous waste after July 26, 1982, or with respect to which closure was certified pursuant to 40 C.F.R. § 265.115, as adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632, after January 26, 1983.

2. With respect to each Study Item which also is a Subject Unit that was closed by removal or decontamination, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1 such tasks as are necessary to demonstrate that the closure met the standard for closure by removal or decontamination in 40 C.F.R. §§ 264.228, 264.280(e), or 264.258, as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

3. With respect to each Study Item which also is a Subject Unit that was not closed by removal or decontamination in accordance with the standard specified in the preceding Paragraph 2, the Company shall include in the Environmental Conditions Investigation Workplan required by Section IV.A.1 such tasks as are necessary to develop the groundwater monitoring and hazardous constituent release characterization information specified in Subpart F of 40 C.F.R. Part 264 and 40 C.F.R. § 270.14(c), as respectively adopted by reference in the Nevada Hazardous Waste Disposal Law program by NAC § 444.8632.

Harding Lawson Associ
Engineering
and
Enviromental Services

SHEET _____ OF _____
JOB NO. _____
DATE _____
PROJECT _____ COMPUTED BY _____
SUBJECT _____ CHECKED BY _____

Consent Agreement Issued
4/22/96

for Mack, J. T. Smith, A. Biaggi, W. Frey, B. Kelso

CEM → okay (completed - no problem)

STIPS →

Oversight Inconsistency →

Necessity of RI → Delete (Responsible For Act) → RI 2

Re-evaluate

RCRA Corr. Docs.

J. T. → RCRA (pg 22-23)

Sect. 3004 u

RCRA post-closure permitting to RCRA Corr Action

proposed EPA rule changes (Sep 94 post-date)

KMCC → Landfill → last waste 1982

July 82 deadline for receipt.

Montrose Ponds → 2 Haz Waste → 3 non-Haz

Defer to individual work plans

WP include substantive additional data for review & evaluation - way to add request for more info

and again 3pm 4/29/96

①

BMI Meeting
4/18/96

B. Conaty, J. Standfield, J. Denison, B. Korsd

Status Update → Consent Agreement
CSM Issue
Qrtrly Report
Interlocal Agreement

Timet → Bevill Exclusion Applicability
Φ4 LDR (proposed this summer) will raise big issues

EPA → No B. Exc. beyond chlorination process
ONLY CSD solids (continuous sludge dryer) (1989-90) 11-13 waste streams
Nevada? (corrosivity or metals)
Barry → several RCRA waste streams generated and mixed (for convenience?)
Is CSD mixed w/characteristic waste?
File correspondence to Barry
May still have 261.4 exclusion for chloride waste solids due to process w/rutile ore (no iron chloride process)

Intent - to achieve appropriate level of mandated environmental protection
- how keep permanent solution out of consent agreement that doesn't meet RCRA minimums
- not intent to bring in RFA - intent to prevent this and "kill 2 birds with one stone."

Bevill Politics?

Montrose

2 characteristic waste ponds (2 & 5)
all covered with clay cap.
verify correspondence and approval
by NDOP to criteria in place @ time
1985 Consent Order → GW monitoring/analysis
- analysis does not necessarily
agree w/constituents of concern.
? an issue about cap squeezing out
fluids? (Jennifer Hughes)

+ background parameter selection
Copy for Barry
latest Sample Report
[2yrs]?

(preserve flexibility but ensure substantive protections)

264 subpart F GW requirements very specific
* RCRA post-closure permit may be Φ3
remedial actions
require substantive data gathering requirements
in ΦII (264 post-closure data gathering)
reference 264 requirements as a baseline

Pioneer

6, 7, 8 closed under interim status by
addressing specific characteristic bringing
RCRA status.
Regs then changed to prevent clean-closure

with other constituents above levels of concern

waste also received after '82

certification in '83

built over Wastewater 1 & 2 (

issue again & gathering of relative data.

Next Qtrly Mtg → 4-6 June tentative

- interlocal

- consent

PETER G. MORROS, Director
L.H. DODGION, *Administrator*
(702) 687-4670
TDD 687-4678

Administration
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

April 16, 1996

MR JOEL MACK
LATHAM AND WATKINS
701 B STREET SUITE 2100
SAN DIEGO CA 92101

Dear Mr. Mack:

This letter is in follow-up to our telephone conversation of Friday April 12, 1996 concerning the ongoing work activities at the BMI complex and in particular the issue of the State certification of Jim Quinn of ERM-West.

As I mentioned in our conversation, Mr. Quinn has been re-certified by the NDEP and has fulfilled all the requirements of recent correspondence to him. The Division has closed the case file on this matter.

In the interest of continuing the work at BMI without delay, the Division will accept all previous documents submitted by Mr. Quinn.

If questions or comments arise, please feel free to contact me.

Sincerely,

Allen Biaggi
Chief,
Bureau of Corrective Actions

AJB:kmf

cc: Bob Kelso, NDEP, Remediation
Quint Arrinao, NDEP Certification
Connie Lewis, NDEP Certification
Susan Stewart, Timet

Printed by Bob Kelso /96 8:04am

From: Allen Biaggi
To: Bob Kelso, Jeff Denison
Subject: Conaty meeting 4/18

====NOTE========== 4/12/96 2:43pm=
CC: Dave Emme, Verne Rosse

~~~~~~

The referenced meeting will be held in the Environmental Health Confrence Room at WCDHD. Time is 1 to 5. Please be sure to be informed/educated on the RCRA issues at BMI.

I also got a call from Joel Mack this PM. He has concerns on the following:

1. Are we a RCRA certified State for CA. I told him yes. He wants our certification documents. I'll ask Colleen for them.

2. He wants to know what we are looking for under RCRA in the workplan. The Montrose Ponds and a landfill are apparently not under a post-closure permit. We need to nail down our position and scope.

3. He doesn't like the values under the stips provisions. They want reduced values in light of the individual companies verses the common areas.

4. He states there is an apparent inconsistency on oversight costs in Paragraphs 1 and 2. He will FAX us a clairification of his concern.

5. Company work plans are forthcoming ~~from most~~ if not all. Expect arrivals by ~~June~~.

6. The CEM issue with Jim Quinn. I told him this is resolved. I'll do a letter stating a replacement is not needed and we will accept the already prepared documents.

Questions? See me.

CA Signed by June ?
WP in June too late ?

Cert Reissued ?
~~~~~~

PETER G. MORROS, Director

L.H. DODGION, *Administrator*

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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

March 28, 1996

MS SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Phase II Consent Agreement - First Kerr-McGee Draft

Dear Ms. Crowley:

Enclosed is a first draft of the Individual Company Consent Agreement between the NDEP and Kerr-McGee Corporation. This version is based on the approved BMI Common Areas Agreement that was effective on February 23, 1996, and should only require discussion of sections that have had substantive changes. It is the intent of the Division to rapidly move forward with this document and, as mentioned at the March 12 Public Meeting, have a signed document within 60 days (i.e., not later than June 1, 1996). The Division is prepared to issue a unilateral order if unwarranted delays are encountered in obtaning this agreement.

The primary changes include:

1. Change from plural to singular when referencing Company throughout the document.

2. The ECI Workplan is referred to as deliverable within 60 days of the Consent Agreement effective date. As such it will be subject to all terms and conditions set forth in the Consent Agreement. If a workplan is available to include with the Consent Agreement, it will be evaluated by the Division for completeness and adequacy in addressing LOU Items. **Lack of an approved workplan is not sufficient reason to delay agreement on the Consent Agreement.**

3. A new paragraph has been added to Section IV which deals with RCRA Post-Closure Requirements.

CUTLER & STANFIELD, L.L.P.

700 Fourteenth Street, N.W.
Washington, D.C. 20005
Telephone: (202) 624-8400
Facsimile: (202) 624-8410

Ref: 08050-03

FACSIMILE COVER SHEET

TO:	FAX NUMBER:	TELEPHONE:
Mr. Robert Kelso	702 885 0868	702 678 5872

FROM: Barry Conaty **DATE:** April 16, 1996

NUMBER OF PAGES (Including this cover sheet): 2

COMMENTS: Attached is a list of certain of the significant RCRA/NHWDL issues we look forward to speaking with you and Mr. Denison about in Reno on Thursday.

IF YOU HAVE DIFFICULTY RECEIVING THIS TRANSMISSION, PLEASE CALL: Karen **AT (202) 624-8400**

- Background on any significant RCRA/NHWDL regulatory activities at the BMI Complex since approximately 1992.

Pioneer/Stauffer Site

- RCRA/NHWDL status of CAPD ponds 6, 7 and 8.

Montrose Site

- RCRA/NHWDL status and history 1993 to present of ponds 1, 2, 3, 4 and 5. Semi-annual reports - GW Monitoring (upgrade GW monitoring scheme per 264) Questioning trends awaiting response

Kerr McGee Site

- RCRA/NHWDL status and history 1993 to present of Sodium Chlorate Filter Cake Holding Area North of Unit 3, Old P-2 Surface Impoundment, Hazardous Waste Landfill, Surface Impoundment S-1, and Surface Impoundment P-1. — 90 day ops. Cr^{VI} issues verify under [illegible] clean closed. per 265 [illegible]

TIMET Site

- Background on the RCRA/NHWDL regulation of the facility since the Bevill exemption was removed from all wastestreams except chloride processing waste solids.

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

October 2, 1995

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

Dear Mr. Rosse:

Subject: Closed Hazardous Waste Landfill
1995 Post Closure Monitoring Results

Kerr-McGee Chemical Corporation's (KMCC) Henderson facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in July, 1995. The wells sampled are associated with the closed hazardous waste landfill located at the Henderson site. Analytical results were compared with 1982/83 baseline values as required under 40 CFR 265.93 (c).

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 1995 sampling the historical upgradient well, M-5, was found dry. Groundwater levels throughout the Henderson area have been decreasing due to lower than normal rainfall. After discussion with Jeff Dennison, Nevada Division of Environmental Protection, a close well, M-57, located about 200 feet upgradient of M-5, was used for upgradient sampling. It is expected that a well will be drilled adjacent to the dry M-5 before the next sampling effort in 1996.

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). This change is consistent with past sampling efforts and is not attributed to the change in upgradient well locations. The change from baseline was trending towards a quality improvement for parameters of pH, SpCd, TOC and TOX. This same trend was apparent in 1991, 1992, 1993 and 1994 monitoring efforts.

Notice of a statistically significant change of an upgradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). There is no evidence the landfill could affect upgradient water quality parameters.

All statistically significant changes from baseline (please see Table 1) 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. 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-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-57 (replacement well for M-5), M-6A and M-7A.

2. A decrease in SpCd in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

3. A decrease in TOC in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

4. A decrease in TOX in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

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 regulated landfill does not affect groundwater quality.

Please feel free to contact S.M. Crowley at 702/651-2234 if you have any questions.

Very truly yours,

Patrick S. Corbett
Plant Manager

SMC:sc\rcra695
cc: SMCrowley
ALDooley
RANapier
MJPorterfield

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring
1995

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-57	6-27-95	1717.15	0.06	ND	ND	520	550	860	<10	1.0	1.2	7.77	3910
										1.0	0.9	7.80	3900
										1.0	1.0	7.76	3900
										1.0	0.4	7.78	3920
							M-57 Average			1.0	0.9	7.78	3908
							M-57 Standard Deviation			0.0	0.3	0.01	8
							Background (M-5) *			62.3	47.7	6.34	10469
							M-57 t-Test			2.49	5.61	9.37	63.52
M-6A	6-27-95	1681.74	ND	ND	0.1	1100	2000	1460	<10	1.4	4.8	7.51	8460
										1.5	5.1	7.48	8440
										1.7	4.5	7.53	8460
										1.4	7.2	7.46	8430
							M-6A Average			1.5	5.4	7.50	8448
							M-6A Standard Deviation			0.1	1.1	0.03	13
							Background (M-5) *			62.3	47.7	6.34	10469
							M-6A t-Test			2.47	5.07	7.52	19.56
M-7A	7-1-94	1684.61	ND	ND	0.02	1200	1900	1440	<10	1.2	3.3	7.52	8670
										1.3	3.0	7.46	8620
										1.1	17.0	7.46	8610
										1.5	13.0	7.46	8460
							M-7A Average			1.3	9.1	7.48	8590
							M-7A Standard Deviation			0.1	6.1	0.03	78
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			2.47	4.52	7.39	17.84
H-28	7-1-94	1691.13	ND	8.6	0.88	810	2600	500	<100	2.8	2.9	6.32	8240
										2.7	2.4	6.28	8220
										2.6	2.3	6.32	8200
										3.0	3.1	6.29	8200
							H-28 Average			2.8	2.7	6.30	8215
							H-28 Standard Deviation			0.1	0.3	0.02	17
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			2.41	5.40	0.24	21.81
Field Blank	7-1-94		ND	ND	ND	ND	ND	ND	<10	<1.0	<0.1	6.10	1

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

TABLE 2. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring - Resample Results

Well #	Date	Water Level (feet)	TOC (mg/l)	TOX (mg/l)	pH	Specific Conductance (umhos/cm)
M-57	7-5-95	1717.76	1.00	6.70	7.75	3920
			5.40	6.20	7.73	3920
			1.00	7.00	7.74	3910
			1.00	6.60	7.85	3920
	M-57 Average		2.10	6.63	7.77	3918
	M-57 Standard Deviation		1.91	0.29	0.05	4
	Background (M-5) *		62.3	47.7	6.34	10469
	M-5 t-Test		2.44	4.92	9.27	63.43
M-6A	7-5-95	1689.2	1.30	3.90	7.39	8520
			1.10	2.70	7.38	8520
			1.30	3.60	7.42	8510
			1.50	3.90	7.44	8520
	M-6A Average		1.30	3.53	7.41	8518
	M-6A Standard Deviation		0.14	0.49	0.02	4
	Background (M-5) *		62.3	47.7	6.34	10469
	M-6A t-Test		2.47	5.29	6.95	18.89
M-7A	7-5-95	1684.26	1.40	5.70	7.41	8690
			1.20	7.40	7.37	8690
			1.20	16.00	7.51	8680
			1.40	16.00	7.42	8680
	M-7A Average		1.30	11.28	7.43	8685
	M-7A Standard Deviation		0.10	4.76	0.05	5
	Background (M-5) *		62.3	47.7	6.34	10469
	M-7A t-Test		2.47	4.16	7.05	15.88
H-28	7-5-95	1690.58	3.10	4.10	6.02	7900
			3.00	4.50	6.03	7890
			2.90	4.60	6.12	7900
			3.00	5.20	6.11	7890
	H-28 Average		3.00	4.60	6.07	7895
	H-28 Standard Deviation		0.07	0.39	0.05	5
	Background (M-5) *		62.3	47.7	6.34	10469
	H-28 t-Test		2.40	5.16	1.75	24.92
Field Blank	7-5-95		<1.0	<1.0	5.8	<1

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

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

Jeff Allen

September 28, 1994

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

Dear Mr. Rosse:

Subject: Closed Hazardous Waste Landfill
1994 Post Closure Monitoring Results

Kerr-McGee Chemical Corporation's (KMCC) Henderson facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in July, 1994. The wells sampled are associated with the closed hazardous waste landfill located at the Henderson site. Analytical results were compared with 1982/83 baseline values as required under 40 CFR 265.93 (c).

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 1994 sampling the historical upgradient well, M-5, was found dry. Groundwater levels throughout the Henderson area have been decreasing due to lower than normal rainfall. After discussion with Jeff Dennison, Nevada Division of Environmental Protection, a nearby well, M-57, located about 200 feet upgradient of M-5, was used for upgradient sampling. It is expected that a well will be drilled adjacent to the dry M-5 before the next sampling effort in 1995.

A statistically significant change from baseline of the historical upgradient well M-5 was detected in parameters of pH, specific conductance (SpCd), total organic carbon (TOC) and total organic halides (TOX). This change is consistent with past sampling efforts and is not attributed to the change in upgradient well locations. The change from baseline was trending towards a quality improvement for parameters of pH, SpCd, TOC and TOX. This same trend was apparent in 1991, 1992, and 1993 monitoring efforts.

Notice of a statistically significant change of an upgradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). There is no evidence the landfill could affect upgradient water quality parameters.

All statistically significant changes from baseline (Table 1) detected in the downgradient monitoring wells described below, reflect a groundwater quality improvement when compared to the 1982/83 baseline values of well M-5. 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-28.

Additional groundwater samples were collected as required under 40 CFR 265.93 (c)(2) and analyzed for pH and SpCd at each well.

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

1. An increase in pH in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

2. A decrease in SpCd in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

3. A decrease in TOC in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

4. A decrease in TOX in M-57 (replacement well for M-5), M-6A, M-7A and H-28.

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 regulated landfill does not affect groundwater quality.

Please feel free to contact S.M. Crowley at 702/651-2234 if you have any questions.

Very truly yours,

Patrick S. Corbett
Plant Manager

SMC:sc\rcra694

cc: SMCrowley
ALDooley
RHJones
MJPorterfield

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
HAZARDOUS WASTE LANDFILL MONITORING RESULTS
1994

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-57	7-6-94	1717.15	0.09	0.1	ND	600	300	720	<20	1.5	0.8	7.8	3520
										1.9	0.7	7.6	3500
										0.7	2.0	7.6	4200
										1.2	0.8	7.7	4250
							M-57 Average			1.3	1.1	7.7	3868
							M-57 Standard Deviation			0.4	0.5	0.1	358
							Background (M-5) *			62.3	47.7	6.34	10469
							M-57 t-Test			2.47	5.59	8.65	47.19
M-6A	7-1-94	1681.74	0.08	0.2	0.1	1300	2000	2300	83	0.7	1.9	7.2	8190
										2.3	1.6	7.2	8290
										2.4	1.5	7.2	8290
										3.4	1.7	7.2	8570
							M-6A Average			2.2	1.7	7.2	8335
							M-6A Standard Deviation			1.0	0.1	0.0	142
							Background (M-5) *			62.3	47.7	6.34	10469
							M-6A t-Test			2.44	5.52	5.60	19.43
M-7A	7-1-94	1684.61	0.08	ND	0.04	1200	1900	1400	ND	1.6	1.9	7.2	7060
										2.1	1.7	7.1	6920
										2.2	1.7	7.0	6750
										1.8	1.7	7.0	6650
							M-7A Average			1.9	1.8	7.1	6845
							M-7A Standard Deviation			0.2	0.1	0.1	157
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			2.45	5.51	4.74	32.57
H-28	7-1-94	1691.13	0.05	36	1.8	900	2500	440	280	0.8	2.7	7.2	5790
										2.7	2.7	6.8	5740
										1.6	2.7	6.7	5740
										0.8	2.6	6.8	5830
							H-28 Average			1.5	2.7	6.9	5775
							H-28 Standard Deviation			0.8	0.0	0.2	38
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			2.47	5.40	3.33	45.24
Field Blank	7-1-94		ND	ND	ND	ND	ND	ND	ND	0.7	<0.03	6.9	3

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

TABLE 2. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
HAZARDOUS WASTE LANDFILL MONITORING - Resample Results

Well #	Date	Water Level (feet)	pH	Specific Conductance (umhos/cm)
M-57	8-10-94	1710.41	7.0	3850
			7.2	4100
			7.1	3750
			7.0	4200
	M-5 Average		7.1	3975
	M-5 Standard Deviation		0.1	182
	Background (M-5)		6.34	10469
	M-5 t-Test		4.74	57.03
M-6A	8-10-94	1681.72	7.1	7800
			7.0	7900
			7.0	7800
			7.2	8000
	M-6A Average		7.1	7875
	M-6A Standard Deviation		0.1	83
	Background (M-5)		6.34	10469
	M-6A t-Test		4.74	24.57
M-7A	8-10-94	1685.3	7.2	8500
			7.2	8400
			7.0	8500
			7.0	8450
	M-7A Average		7.1	8463
	M-7A Standard Deviation		0.1	41
	Background (M-5)		6.34	10469
	M-7A t-Test		4.88	19.32
H-28	8-10-94	1692.15	6.9	7200
			7.0	7150
			7.0	7250
			6.9	7200
	H-28 Average		7.0	7200
	H-28 Standard Deviation		0.0	35
	Background (M-5)		6.34	10469
	H-28 t-Test		3.96	31.52
Field Blank	8-10-94		6.9	3

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

P 867 000 827

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

4a. Article Number
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5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

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Ray Hamm

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L. H. DODGION
Administrator

Administration:
(702) 687-4670
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STATE OF NEVADA
BOB MILLER
Governor

[illegible] G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

August 18, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Subject: Draft Phase II Consent Agreement Between NDEP and Kerr-McGee Chemical Company (KMCC)

Dear Ms. Crowley:

Transmitted herein, please find one copy of the draft Phase II consent agreement between KMCC and the State of Nevada, Division of Environmental Protection (NDEP). The language of the agreement itself is generic in that the exact same wording is being distributed to each of the BMI companies. The agreement requires, primarily, the development and implementation of a "Facility Investigation Workplan" which will address the items discussed, agreed upon, and set forth in the individual letters of understanding (LOUs). In the context of the Phase II consent agreement, the LOU items are outlined in Attachment A, Task II and are referred to as "Study Items". In this draft agreement, the "Study Items" can be found attached to the end of Attachment A. These will be inserted into the final document (see page A-12).

You will note that the language of the "Study Items" differs slightly from the language of the last rendition of the LOU. The changes were made in order to make the language more consistent with the "contractual" nature of the draft agreement. No changes of a substantive nature were made.

The Division requests that you review the draft agreement, including all of the attachments, and submit your comments, proposed language modifications, etc., no later than **September 30, 1994**. We in turn will review your submittal and, if deemed appropriate, will modify the agreement.

Verne / Ed

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
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Waste Management
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

August 18, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
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Henderson, Nevada 89009-7000

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RETURN RECEIPT REQUESTED

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The Division requests that you review the draft agreement, including all of the attachments, and submit your comments, proposed language modifications, etc., no later than **September 30, 1994**. We in turn will review your submittal and, if deemed appropriate, will modify the agreement.

Should the Division determine that your comments, proposed modifications, etc. are inappropriate or otherwise cannot be addressed, we will notify you of same and will include a detailed explanation of our position.

After reviewing NDEP's position statement, you may either choose to acquiesce to the document as written or to continue to negotiate. If the latter, NDEP proposes that a period of negotiation, not to exceed 30 days, be entered into during which both parties may conduct a dialogue in an effort to resolve the areas of disagreement. At the end of this period, if items of dispute still remain, you may either choose to sign the agreement as it exists at that time, or you may decline. The Division believes it is necessary to place a reasonable time limit on the consent agreement negotiation process. Recently, EPA has expressed a renewed interest in the progress of the State directed investigation of concerns at BMI. In consideration of the already lengthy gap between the close of Phase I and the initiation of Phase II, NDEP feels that further delays are unacceptable. Admittedly, the task of drafting the agreement has taken more time than anticipated. We therefore, solicit your cooperation in making the consent agreement negotiation process as brief as possible.

As I shall be leaving the Division this month to pursue, full time, a doctoral degree at the University of Nevada, Reno, any questions which you may have during the interim period prior to September 30th should be addressed to either Mr. Allen Biaggi or Mr. Robert Kelso at (702) 687-4670, extensions 3021 and 3020, respectively.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

Enclosures

Certified Mail #P 867 000 827

cc: See attached page

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

Jeff C. Harris, Coordinator, Clark County Department of Comprehensive Planning, 225 Bridger Avenue, 7th Floor, Las Vegas, Nevada 89155

L.H. Dodgion, Administrator, NDEP

Verne Rosse, Deputy Administrator, NDEP

Dick Serdoz, NDEP

Kent Hanson, Deputy Attorney General, NDEP

Allen Biaggi, NDEP

Robert Kelso, NDEP

Jeff Denison, NDEP

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Administrator

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(702) 687-4670
Fax 687-5856

Air Quality
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Waste Management
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

August 15, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: Phase II Letter of Understanding Between NDEP and Kerr-McGee Chemical Corporation (KMCC)

Dear Ms. Crowley:

It is the understanding of the Nevada Division of Environmental Protection that, based upon our meetings, discussions, and correspondence with yourself and other representatives of Kerr-McGee Chemical Corporation, Kerr-McGee agrees to perform the following environmental assessment and information gathering activities at or pertaining to the KMCC's Henderson, Nevada facilities. The numbering of the particular items to be addressed follows the system used in NDEP's recommendations (dated December 16, 1992) based upon the Phase I ECA report.

1) On-Site Portions of "Trade Effluent" Settling Ponds and Associated Vitrified Clay Piping, SWMU KMCC-014:

Provide the results of soil sampling performed by Datachem (KMCC Final Phase I Report Reference K353 "Analytical reports of soil samples taken in the vicinity of proposed SIs WC-1 and WC-2").

Provide a work plan for characterization of potential contamination in the western portion of the KMCC "Trade Effluent" pond area (that area which lies west of Ponds WC-1 and WC-2 and east of the earthen berm which defines the eastern margin of the On-site Hazardous Waste Landfill. Historical usage and waste disposal practices are to be used to establish the list of analytes to be evaluated.

2) Open Area Due South of "Trade Effluent Disposal Ponds:

KMCC will attempt to further delineate this poorly defined historic disposal area and to establish the nature of materials deposited therein. KMCC will incorporate characterization of this area in the work plan for #1 above ("Trade Effluent" Settling Ponds).

3) Air Pollutant Emissions Associated with Industrial Processes:

Provide specific references to those passages in KMCC's Final Phase I report (and any other sources of information) which describe the nature (vapor, particulate, etc.) of historical and current air emissions at the KMCC facility. For those emissions which are determined to have been or which are presently depositional in nature, KMCC will provide information regarding patterns of dispersion and probable deposition.

4) Hardesty Chemical Company Site:

Provide analytical data obtained from sampling of the ground water monitoring wells installed on the J.B. Kelley lease site. Although these wells were installed for the evaluation of potential hydrocarbon contamination from the underground storage tanks formerly located at the J.B. Kelley site, they are in the area where Hardesty is believed to have carried out its operations. NDEP may request additional sampling of these wells with an expanded list of analytes.

KMCC will provide NDEP with any additional information regarding the past operation of Hardesty Chemical Company at the KMCC facility which may be reasonably available, including facility locations, products, waste streams, and waste disposal. KMCC and NDEP will then determine what additional investigatory work is necessary based upon the identified information concerning the activities of Hardesty at the KMCC site.

5) On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1:

Identify segments or tributaries of these conveyances (if any) which received waste streams from KMCC or its predecessors/tenants exclusively. Those portions of the conveyances which historically received waste streams

from two or more of the BMI companies, will be addressed as BMI Common Areas Issues. For those segments or tributaries identified as having been utilized by KMCC or its tenants exclusively, KMCC will prepare a work plan to characterize residual contamination by contaminants of concern which may exist therein.

6) Unnamed Drainage Ditch Segment:

Based upon KMCC's assertion that this ditch is in fact the Northwest Drainage Ditch which received waste streams from more than one BMI company, this area will be addressed as a BMI Common Areas issue.

7) Old P-2 Pond and Associated Conveyance Facilities:

Provide a work plan for sampling of subsurface soils in the area of the former pond to confirm that residual material concentrations are below State and Federal action levels.

8) P-3 Pond and Associated Conveyance Facilities:

KMCC will provide a work plan for sampling of subsurface soils in the area of the former pond to confirm that residual material concentrations are below State and Federal action levels. As a necessary component of this work plan, KMCC will provide additional information on the location, regulatory/closure status, and release history of this impoundment. KMCC will also provide information on the disposition of contaminated material removed from this pond.

9) New P-2 Pond and Associated Piping:

Provide engineering specifications of the impoundment including leak detection systems (e.g. double lined with leachate collection) and the location and configuration of monitor wells intended for this purpose. Provide information regarding the operational and regulatory status of this impoundment and release history (if applicable).

Issues exclusively concerning Total Dissolved Solids impacts to ground or surface water will continue to be addressed by NDEP's Bureau of Water Pollution Control.

10) On-Site Hazardous Waste Landfill, SWMU KMCC-013:

Provide the Division with copies of correspondence relating to the closure and post closure status of the landfill. This information should include the post-closure plan.

11) SWMU KMCC-005:

Provide specific information (i.e. volume of material, depth of excavation, criteria used to determine extent of contamination, etc.) relating to the removal of the "old drying pad" and underlying fill material and native soils. Provide an evaluation of the feasibility of collecting confirmatory samples of soil from beneath the area of the old pad.

12) Hazardous Waste Storage Area, SWMU KMCC-006:

No further action is required at this time.

13) Pond S-1:

No further action is required at this time. A review of the RCRA permit status of this SI may be required pending the outcome of Phase II investigations.

14) Pond P-1, and Associated Conveyance Piping:

KMCC will provide Closure documentation for this impoundment. A review of the RCRA permit status of this SI may be required pending the outcome of Phase II investigations. No further action is anticipated at this time.

15) Platinum Drying Unit, SWMU KMCC-007:

KMCC will provide either analytical data or a technically based argument supporting their contention that minor staining of the soil surrounding this unit is not a threat to either human health or the environment and is not a violation of State or Federal regulations. Included in this information shall be a discussion of how KMCC has revised housekeeping practices so as to eliminate or minimize further releases of material from this unit.

16 & 17) Ponds AP-1 and AP-2, and Associated Transfer Lines and Ponds AP-3 and Associated Transfer Lines:

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from these impoundments. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

Because ammonium perchlorate is highly soluble in water, and due to the fact that the ammonium ion (NH^{4+}) may be rapidly transformed to nitrate by the action of indigenous microbes in the soil through the process of nitrification, the AP pond area should be evaluated for potential ground water impacts by nitrates.

Provide an evaluation of the potential reactivity of ammonium perchlorate in the ponds and in site soils.

Provide chromium concentration data for pond contents.

Provide a summary diagram/facility map which more accurately identifies the location of the AP impoundments and the other waste management units/areas of concern at the KMCC facility. Modification of Plate 3-2 of the KMCC final Phase I report would be acceptable for this purpose.

Issues exclusively concerning Total Dissolved Solids impacts to ground or surface water will continue to be addressed by NDEP's Bureau of Water Pollution Control.

18) Pond AP-4:

Reference items 16 & 17 above. The issue of potential chromium contamination is not applicable to this impoundment.

19) Pond AP-5:

Reference items 16 & 17 above. The issue of potential chromium contamination is not applicable to this impoundment.

20) Pond C-1 and Associated Piping, SWMU KMCC-011:

This impoundment has the potential to impact ground water with elevated levels of total dissolved solids. With the

exception of manganese which has a secondary MCL of 50 ug/L, no other compounds of concern appear to have been disposed here. The potential presence of manganese in site ground water should be evaluated (reference to the KMCC hydrologic evaluation of the site performed in July of 1993 is acceptable).

Issues exclusively concerning Total Dissolved Solids impacts to ground or surface water will continue to be addressed by NDEP's Bureau of Water Pollution control. The planned closure of this impoundment should be coordinated with the BWPC as well.

21) Pond Mn-1 and Associated Piping:

Reference item 20 above. It is understood that closure of this impoundment is not anticipated by KMCC at this time.

22) Pond WC-1 and Associated Piping, SWMU KMCC-015:

No further action is required at this time.

23) Pond WC-2 and Associated Piping:

Provide information regarding the clean up of apparently contaminated soil referred to in the KMCC Final Phase I Report.

24) Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area, SWMU KMCC-009:

Provide a technically based argument (which may include existing TCLP and EP Toxicity data) to demonstrate that pre-1975 disposal of slurried and solid waste to these areas will not have the potential to impact ground water with manganese.

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from these waste management units. Include a list of the analytes which are currently monitored for and the latest monitoring data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

25) Process Hardware Storage Area, SWMU KMCC-001:

No further action is required at this time.

26) Trash Storage Area:

No further action is required at this time.

27) PCB Storage Area, SWMU KMCC-003:

No further action is required at this time.

28) Hazardous Waste Storage Area, SWMU KMCC-004

Provide documentation of the remediation of hydrocarbon contaminated soil observed during Kleinfelder's site reconnaissance. This documentation should include confirmatory sampling and analysis using EPA Method 8015 modified for petroleum hydrocarbons.

29) Solid Waste Dumpsters, SWMU KMCC-008

No further action is required at this time.

30) Ammonium Perchlorate Area - Pad 35, SWMU KMCC-0017:

No further action is required at this time.

31) Drum Crushing and Recycling Area, SWMU KMCC-018:

Provide documentation of the remediation of minor soil staining in this area.

Provide information regarding improvements in area operating procedures for the removal of residual materials from drums prior to storage and crushing so as to minimize or eliminate spillage of waste materials to the ground.

32) Ground Water Remediation Unit, SWMU KMCC-019:

Provide information regarding improvements in area operating procedures for the purpose of minimizing or eliminating spillage of waste materials to the ground. Document any modifications made to the remediation unit for this purpose.

33) Sodium Perchlorate Platinum By-Product filter, SWMU KMCC-021

KMCC will provide a written statement describing the repair of floor cracks in this unit. ***Beyond this,*** no further action is required at this time.

34) Former Manganese Tailings Area, SWMU KMCC-022:

Reference item 24 above.

35) Truck Emptying/Dump Site, SWMU KMCC-025:

Provide a sampling plan for assessment/characterization of "unknown" waste materials disposed in this area.

36-38) Former Satellite Accumulation Points:

No further action is required at this time.

39) Satellite Accumulation Point - AP Maintenance Shop, SWMU KMCC-29:

Provide documentation of remediation of minor spill noted in the Phase I Report. This should include information regarding the association between the spill and the 1,1, 1-trichloroethane stored in this area.

Provide information regarding improvements in area operating procedures for the purpose of minimizing or eliminating spillage of waste materials.

40) PCB Transformer Spill:

No further action is required at this time.

41) Unit 1 Tenant Stains:

Provide documentation of remediation of hydrocarbon impacted soil in this area.

42) Unit 2 Salt Redler:

No further action is required at this time

43) Unit 4 and 5 Basements:

Provide a discussion concerning the feasibility of characterization and removal and/or stabilization of residual chromium contamination in the unsaturated zone beneath these units.

Provide, as a stand alone document, a full re-evaluation of the effectiveness of the chromium recovery system. Included should be such items as aquifer properties and characteristics, ground water flow patterns, capture and

reinjection zones, influent concentration trends, etc. A discussion of the transport and fate of chromium within the shallow aquifer and within the vadose zone beneath units 4 & 5 should also be included in this document.

44) Unit 6 Basement:

Provide a technically based discussion of the potential impacts to ground water from manganese bearing solutions and from residual high/low pH contamination in the vadose zone which may have resulted from leakage of the basement of this unit. A discussion is required of the engineering features, leak detection system(s), and periodic maintenance of the basement liner and any other appropriate method of addressing the issue of potential on-going releases. Ground water monitoring data should be used to document impacts (or lack thereof) from residual contamination beneath the unit.

45) Diesel Storage Tank:

Within 180 days of receipt of this letter of understanding, KMCC will provide the Division with a work plan designed to address visible and potential hydrocarbon contamination of soil and/or ground water in this area. If KMCC decides to renovate the tank, integrity testing (including some form of non-destructive testing of the tank bottom) will be performed. If KMCC decides to discontinue tank use, the tank will be removed and the area assessed for contamination.

46) Former Old Main Cooling Tower and Recirculation Lines:

No further action is required at this time.

47) Leach Plant Area Manganese Ore Piles:

Provide data/documentation from industrial hygiene studies to on-site workers and off-site residents from exposure to manganese ore and or manganese compounds.

48) Leach Plant Anolyte Tanks:

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential manganese and pH contaminant migration from this area. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

49) Leach Plant Area Sulfuric Acid Storage Tank:

Reference item 48 above.

50) Leach Plant Area Leach Tanks:

Reference item 48 above.

51) Leach Plant Area Transfer Lines:

Reference item 48 above.

52) AP plant Area Screening Building, Dryer Building and Associated Sump:

Provide documentation of remediation of "minor white staining" from ammonium perchlorate wash downs and modifications to area procedures to mitigate or eliminate further releases of waste materials.

53) AP Plant Area Tank Farm:

Provide documentation of remediation of small visible staining and repair or replacement of the concrete pad.

Provide a discussion of procedural changes intended to mitigate or eliminate further releases of waste materials.

54) AP Plant Area Change House/Laboratory Septic Tank:

Provide a work plan for assessment/characterization of potential contamination related to waste chemical disposal via the laboratory septic system.

55) Area Affected by July 1990 Fire:

Provide documentation of the remediation of the impacted area including specific data (e.g. waste volume, etc.) regarding material disposal at U.S. Ecology.

56) AP Plant Area Old Building D-1 -- Washdown:

Provide a technically based discussion concerning the environmental fate of ammonium perchlorate in site soils (see also the requirements of item # 52 above).

57 & 58) AP Plant Area New Building D-1 -- Washdown and AP Plant Transfer Lines to Sodium Chlorate Process:

No further action is required at this time.

59) Storm Sewer System:

Provide documentation of system flow/integrity investigations as part of a technical evaluation concerning the potential for soil and/or ground water contamination resulting from waste disposal and storm water discharges through the storm sewer system.

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from the storm sewer system. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

60) Acid Drain System:

Provide a technically based evaluation of the potential for soil and/or ground water contamination resulting from historic waste disposal through the acid drain system.

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from the acid system. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

61) Old Sodium Chlorate Plant Decommissioning:

No further action is required at this time.

62) State Industries, Inc. Site, Including Impoundments and Catch Basin:

Provide a work plan for the complete assessment/ characterization of the State Industries surface impoundments. Analytes should be selected based upon known or suspected waste streams disposed to these ponds and should include TCLP metals, volatile organic compounds (if applicable), TPH (if applicable), and pH.

63) J.B. Kelley, Inc. Trucking Site:

Provide closure and/or remediation documentation for the underground storage tanks formerly located at this site. Include data from the ground water monitor wells installed by KMCC to evaluate potential hydrocarbon contamination.

Provide an assessment plan to characterize areas potentially impacted by truck washing rinsate and liquids and sludges present in the concrete vaults at this site.

64) Koch Materials Company Site:

Provide documentation of KMCC's efforts, in conjunction with those of Koch Materials Co., to remediate hydrocarbon contamination and to develop operating procedures and/or containment structures to prevent further releases of petroleum hydrocarbons and other wastes.

65) Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company, and Ebony Construction Sites:

Determine whether soil staining identified in this area is coincident with the staining referred to in item 41 above. If the staining is not coincident with this item, provide documentation of KMCC's efforts to work with these tenants for the purpose of remediating hydrocarbon contamination and developing operating procedures and/or containment structures to prevent further releases of hydrocarbon compounds and other waste materials.

66) Above-Ground Diesel Storage Tank Leased by Flintkote Co.

No further action is required at this time.

67) Delbert Madsen and Estate of Delbert Madsen Site:

Provide documentation of KMCC's efforts to work with the tenant to further assess and characterize contamination which may be present at this location.

68) Southern Nevada Auto Parts Site:

Provide documentation of KMCC's efforts to work with the tenant to further assess and characterize contamination which may be present at this location.

69) Dillon Potter Site:

No further action is required at this time.

The tasks outlined above will be incorporated (as an attachment) into the forthcoming Phase II Consent Agreement to be negotiated with KMCC. That document will provide the specific framework wherein these tasks shall be accomplished.

Should you have any questions or comments regarding any of the items, please contact either Allen Biaggi or myself at (702) 687-4670, extensions 3021 and 3017, respectively.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

cc: Russell Jones, Staff Environmental Engineer, Kerr-McGee Chemical Corporation, Kerr-McGee Center, P.O. Box 25861, Oklahoma City, Oklahoma 73125

Patrick S. Corbett, Plant Manager, Kerr-McGee Chemical Corporation, P.O. box 55, Henderson, Nevada 89009-7000

Thomas W. Read, Senior Hydrologist, Hydrology-Technology Division,Kerr-McGee Chemical Corporation, Kerr-McGee Center, P.O. Box 25861,Oklahoma City, Oklahoma 73125

John Stauter, Kerr-McGee Chemical Corporation, Kerr-McGee Center, P.O. Box 25861, Oklahoma City, Oklahoma 73125

Patricia Redd Demps, Esq., Kerr-McGee Chemical Corporation, Kerr-McGee Center, P.O. Box 25861, Oklahoma City, Oklahoma 73125

Carl D. Savely, Esq., Lionel Sawyer & Collins, 1700 Valley Bank Plaza, 300 South fourth Street, Las Vegas, Nevada 89101

Mark T. Calhoun, Director of Public Works, City of Henderson, 243 Water Street, Henderson, Nevada 89015

Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

Jeff C. Harris, Coordinator, Clark County Department of Comprehensive Planning, 225 Bridger Avenue, 7th Floor, Las Vegas, Nevada 89155

L.H. Dodgion, Administrator

Verne Rosse, Deputy Administrator

Dick Serdoz, NDEP Las Vegas

Kent Hanson, Deputy Attorney General, NDEP

Allen Biaggi, NDEP

Robert Kelso, NDEP

Jeff Denison, NDEP

ED: AS A FILE
ALT PLEASE DRAFT A
TRANS. LTTR TO BARRY
FOR THIS INFO. FOR
THEIR REVIEW/COMMENT.
AB

August 12, 1994

MEMORANDUM

TO: Allen Biaggi

FROM: Ed Basham

SUBJECT: KMCC Sampling of Warm Springs Road Extension Right-of-Way, Northwest, and Western Drainage Ditches

I have re-reviewed the sampling plan submitted by KMCC last October in light of their recent submittal, and am reminded that we neither approved of the plan, nor responded with any comments. The results of the sampling indicate trace amounts (well below regulatory thresholds) of DDT, DDE, and beta-BHC are present in the soil. The original sampling plan called for 3 samples along the former Northwestern Drainage ditch and 1 in the Western Drainage ditch (apparently coincident with Warm Springs Road). These were to be composites from 0-1' and 4-5' (2 samples). I wonder what the rationale was regarding skipping the 1-4' interval. Seven samples were to be taken along the proposed Warm Springs right-of-way. That I can tell, only 5 samples were taken.

Of the three monitor wells sampled, two (M47 & M48) contained elevated chromium, arsenic, and chloroform. These are well down gradient of the chromium intercept and removal system and in close proximity to the proposed roadway alignment. The clean well (M10) is located up-gradient of all known contaminant sources with the exception of State Industries. M10 is cross-gradient and slightly down gradient from this former facility.

My overall impression is that the data is probably OK and may be sufficient to screen the roadway alignment. However, KMCC's data report needs to be fleshed out to include more than just lab reports. The location of samples need to be identified and the rationale behind the selection of composite samples from 0-1' and 4-5' only, requires explanation. By the criteria set forth in the

draft Phase II agreement, this sampling event would not be approvable because of the sketchy documentation.

I would also suggest that the data be passed by Barry for scrutiny and comment. Obviously the City wants the road to go through. How this may effect their desire for rigorous characterization protocol remains to be seen.

ED

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

August 4, 1994

Alan Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi:

In late 1993, Kerr-McGee Chemical Corporation (KMCC) submitted a sampling plan for collecting soil samples along the proposed Warm Springs right-of-way. The results are included as Attachment 1. In addition to the soil samples, KMCC sampled several monitor wells in the vicinity of the right-of-way. The results of these samples are also included as Attachment 2.

You will note that only samples from the portion of the right-of-way on KMCC property are included. A separate sampling plan is being prepared by BMI to collect samples on the common areas property.

If you have any questions regarding this information, please contact me at (702) 651-2234.

Sincerely,

Susan Crowley /g
Susan M. Crowley
Staff Environmental Specialist

Attachments
a:\wsrbiaggi.wpd (5.1)

cc: PSCorbett w/o attachments
RJones w/attachments
JCStauter w/attachments
PRDemps w/o attachments

ATTACHMENT 1

Warm Springs Road Right-of-Way Soil Samples

Sample	Sodium Chlorate (ppm)
WSR 1	<10
NWD 1A	<10
NWD 1B	<10
WSR 2	<10
NWD 2A	<10
NWD 2B	<10
WSR 3	<10
NWD 3A	<10
NWD 3B	<10
WSR 4	<10
WSR 5	<10

KMCC Lab Supervisor G. A. Mischler 8/5/94

WSR = Warm Springs Road ROW
NWD = Northwest Drainage Ditch

ANALYTICAL LABS SAN FRAN
467 Potrero Avenue, San Francisco, CA 94110 (415)5

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To Tom Reed	From Colleen Harper
Co. Kerr-McGee	Co.
Dept.	Phone #
Fax # 405-270-4244	Fax #

POLARIZED LIGHT MICROSCOPY ANALYSIS FOR ASBESTOS

CLIENT: GTEL ENVIRONMENTAL LABORATORIES, INC.
4080 PIKE LANE, SUITE C
CONCORD, CALIFORNIA 94519

REPORT #: 932701
DATE: OCTOBER 28, 1993 11 SAMPLES RECEIVED
ANALYST: OLGA KIFT 11 SAMPLES ANALYZED

LOCATION: WARM SPRINGS ROAD PROJECT, HENDERSON, NEVADA
WORK ORDER NO.: C3100278

		ASBESTOS		NON ASBESTOS	
SAMPLE #	DESCRIPTION/LOCATION	DETECTED?	ASBESTIFORM (%)	OTHER FIBERFORM (%)	BALANCE (%)
1. NWD-3A	TAN SANDY SOIL	YES	CHRYS <1	CELL <1	SILI, MICA, CARB, MISC. 99
2. NWD-3B	TAN GRANULAR SOIL	NO			SILI, CARB, MICA, MISC. 100
3. WSR-5	TAN GRANULAR SOIL	NO		CELL <1	SILI, MICA, CARB, MISC. 99
4. WSR-4	TAN GRANULAR SOIL	NO		CELL <1	SILI, MICA, CARB, MISC. 99
5. WSR-3	TAN SANDY SOIL	YES	CHRYS <1	CELL <1	SILI, CARB, MICA, MISC. 99
6. WSR-2	TAN SANDY SOIL	NO		CELL <1	SILI, CARB, MICA, GLASS, MISC. 99
7. WSR-1	TAN GRANULAR SOIL	NO		CELL <1	SILI, CARB, MICA, GLASS, MISC. 99
8. NWD-1A	TAN SANDY SOIL	NO		CELL <1	SILI, CARB, MICA, GLASS, MISC. 99
9. NWD-1B	TAN-GREY GRANULAR SOIL	NO			SILI, CARB, MICA, MISC. 100
10. NWD-2A	TAN-GREY GRANULAR SOIL	YES	CHRYS <1	GL <1 CELL <1	SILI, CARB, MICA, MISC. 99
11. NWD-2B	TAN-GREY GRANULAR SOIL	NO			SILI, CARB, MICA, MISC. 100

AUTHORIZED SIGNATURE

DATE 10/28/93

ASBESTOS
CHRYS: Chrysotile
AMOS: Amosite
CROC: Crocidolite
TREM: Tremolite/Actinolite
ANTH: Anthophyllite

NONASBESTOS
CELL: Cellulose
GL: Fiberglass/Mineral wool
SYN: Synthetic
CARB: Carbonates
SILI: Mixed Silicates
POLY: Polystyrene
FTALC: Fibrous Talc
FGYP: Fibrous Gypsum
FELD: Feldspars
CASI: Calcium Silicates

Project ID: Warm Springs Road Samp.
Henderson, NV
Work Order Number: C3-10-0278

ANALYTICAL RESULTS

Matrix: Soil

				Sample Number	01	02	03	04
				Sample Identification	NWD-3A	NWD-3B	WSR-5	WSR-4
				Date Sampled	10/11/93	10/11/93	10/11/93	10/11/93
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Cyanide	mg/Kg	0.08	EPA 335.2	10/26/93	<0.08	<0.08	<0.08	<0.08

				Sample Number	05	06	07	08
				Sample Identification	WSR-3	WSR-2	WSR-1	NWD-1A
				Date Sampled	10/11/93	10/11/93	10/11/93	10/11/93
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Cyanide	mg/Kg	0.08	EPA 335.2	10/26/93	<0.08	<0.08	<0.08	<0.08

				Sample Number	09	10	11	102693
				Sample Identification	NWD-1B	NWD-2A	NWD-2B	METHOD BLANK
				Date Sampled	10/11/93	10/11/93	10/11/93	--
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Cyanide	mg/Kg	0.08	EPA 335.2	10/26/93	<0.08	<0.08	<0.08	<0.08

Note: Test Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, March, 1983.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project ID: Warm Springs Road Samp.
Henderson, NV
Work Order Number: C3-10-0278

Table 1

ANALYTICAL RESULTS

Metals in Soil

GTEL Sample Number			01	02	03	04
Client Identification			NWD-3A	NWD-3B	WSR-5	WSR-4
Date Sampled			10/11/93	10/11/93	10/11/93	10/11/93
Date Prepared (Method 3055[b])			10/18/93	10/18/93	10/18/93	10/18/93
Date Analyzed (Method 6010)			10/19/93	10/19/93	10/19/93	10/19/93
Date Analyzed (Method 7060)			10/19/93	10/19/93	10/19/93	10/19/93
Date Prepared and Analyzed (Method 7471)			10/19/93	10/19/93	10/19/93	10/19/93
Analyte	EPA Method[a]	Detection Limit, mg/Kg	Concentration, mg/Kg			
Arsenic	EPA 7060[d]	0.5	3.6	5.0	1.7	2.0
Barium	EPA 6010[c]	0.5	170	160	150	140
Cadmium	EPA 6010[c]	0.5	<0.5	<0.5	<0.5	<0.5
Chromium, total	EPA 6010[c]	1	16	16	8	11
Lead	EPA 6010[c]	5	24	23	14	10
Mercury	EPA 7471[e]	0.1	<0.1	<0.1	<0.1	<0.1
Selenium	EPA 6010[c]	5	<5	<5	<5	<5
Silver	EPA 6010[c]	1	<1	<1	<1	<1
Detection Limit Multiplier			1	1	1	1
Percent Solids			98.1	92.2	95.1	94.1

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a wet weight basis.
b. Draft EPA method 3055 SW-846 Third Addition Revision 1 Sept 1991.
c. Inductively Coupled Argon Plasma (ICP)
d. Graphite Furnace Atomic Absorption (GFAA)
e. Cold Vapor Atomic Absorption (CVAA)

GTEL ENVIRONMENTAL LABORATORIES, INC.

Table 1 (continued)

ANALYTICAL RESULTS

Metals in Soil

GTEL Sample Number			05	06	07	08
Client Identification			WSR-3	WSR-2	WSR-1	NWD-1A
Date Sampled			10/11/93	10/11/93	10/11/93	10/11/93
Date Prepared (Method 3055[b])			10/18/93	10/18/93	10/18/93	10/18/93
Date Analyzed (Method 6010)			10/19/93	10/19/93	10/19/93	10/19/93
Date Analyzed (Method 7060)			10/19/93	10/19/93	10/19/93	10/19/93
Date Prepared and Analyzed (Method 7471)			10/19/93	10/19/93	10/19/93	10/19/93
Analyte	EPA Method[a]	Detection Limit, mg/Kg	Concentration, mg/Kg			
Arsenic	EPA 7060[d]	0.5	2.9	2.2	1.8	22
Barium	EPA 6010[c]	0.5	140	110	99	140
Cadmium	EPA 6010[c]	0.5	<0.5	<0.5	<0.5	<0.5
Chromium, total	EPA 6010[c]	1	9	8	7	13
Lead	EPA 6010[c]	5	20	9	9	10
Mercury	EPA 7471[e]	0.1	<0.1	<0.1	<0.1	<0.1
Selenium	EPA 6010[c]	5	<5	<5	<5	<5
Silver	EPA 6010[c]	1	<1	<1	<1	<1
Detection Limit Multiplier			1	1	1	1
Percent Solids			98.8	98.9	98.7	99.1

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a wet weight basis.
b. Draft EPA method 3055 SW-846 Third Addition Revision 1 Sept 1991.
c. Inductively Coupled Argon Plasma (ICP)
d. Graphite Furnace Atomic Absorption (GFAA)
e. Cold Vapor Atomic Absorption (CVAA)

Table 1 (continued)

ANALYTICAL RESULTS

Metals in Soil

GTEL Sample Number			09	10	11	101893-MET
Client Identification			NWD-1B	NWD-2A	NWD-2B	METHOD BLANK
Date Sampled			10/11/93	10/11/93	10/11/93	–
Date Prepared (Method 3055[b])			10/18/93	10/18/93	10/18/93	10/18/93
Date Analyzed (Method 6010)			10/19/93	10/19/93	10/19/93	10/19/93
Date Analyzed (Method 7060)			10/19/93	10/19/93	10/19/93	10/19/93
Date Prepared and Analyzed (Method 7471)			10/19/93	10/19/93	10/19/93	10/19/93
Analyte	EPA Method[a]	Detection Limit, mg/Kg	Concentration, mg/Kg			
Arsenic	EPA 7060[d]	0.5	26	2.6	<0.5	<0.5
Barium	EPA 6010[c]	0.5	120	130	100	<0.5
Cadmium	EPA 6010[c]	0.5	<0.5	<0.5	<0.5	<0.5
Chromium, total	EPA 6010[c]	1	8	11	10	<1
Lead	EPA 6010[c]	5	9	14	12	<5
Mercury	EPA 7471[e]	0.1	<0.1	<0.1	<0.1	<0.1
Selenium	EPA 6010[c]	5	<5	<5	<5	<5
Silver	EPA 6010[c]	1	<1	<1	<1	<1
Detection Limit Multiplier			1	1	1	1
Percent Solids			96.2	98.9	95.8	NA

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a wet weight basis.
b. Draft EPA method 3055 SW-846 Third Addition Revision 1 Sept 1991.
c. Inductively Coupled Argon Plasma (ICP)
d. Graphite Furnace Atomic Absorption (GFAA)
e. Cold Vapor Atomic Absorption (CVAA)

NA = Not Applicable.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project ID: Warm Springs Road Samp.
Henderson, NV
Work Order Number: C3-10-0278

Table 1

ANALYTICAL RESULTS
Volatile Halocarbons and Aromatics in Soil
EPA Method 8240[a]

GTEL Sample Number		01	02	03	04
Client Identification		NWD-3A	NWD-3B	WSR-5	WSR-4
Date Sampled		10/11/93	10/11/93	10/11/93	10/11/93
Date Analyzed		10/25/93	10/25/93	10/25/93	10/25/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Benzene	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5	<0.5	<0.5	<0.5	<0.5
Detection Limit Multiplier		1	1	1	1
Percent Solids		98.1	92.2	95.1	94.1
BFB surrogate, % recovery		87.1	94.6	97.8	91.5

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a dry weight basis.

Note: 8010/8020 analyte list reported.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Table 1 (Continued)

ANALYTICAL RESULTS
Volatile Halocarbons and Aromatics in Soil
EPA Method 8240[a]

GTEL Sample Number		05	06	07	08
Client Identification		WSR-3	WSR-2	WSR-1	NWD-1A
Date Sampled		10/11/93	10/11/93	10/11/93	10/11/93
Date Analyzed		10/25/93	10/25/93	10/25/93	10/25/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Benzene	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5	<0.5	<0.5	<0.5	<0.5
Detection Limit Multiplier		1	1	1	1
Percent Solids		98.8	98.9	98.7	99.1
BFB surrogate, % recovery		90.2	96.9	87.9	96.5

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a dry weight basis.

Note: 8010/8020 analyte list reported.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Table 1 (Continued)

ANALYTICAL RESULTS
Volatile Halocarbons and Aromatics in Soil
EPA Method 8240[a]

GTEL Sample Number		09	10	11	102593 MSC-1
Client Identification		NWD-1B	NWD-2A	NWD-2B	METHOD BLANK
Date Sampled		10/11/93	10/11/93	10/11/93	–
Date Analyzed		10/25/93	10/25/93	10/25/93	10/25/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Benzene	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5	<0.5	<0.5	<0.5	<0.5
Detection Limit Multiplier		1	1	1	1
Percent Solids		96.2	98.9	95.8	NA
BFB surrogate, % recovery		92.1	91.4	100	96.6

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Results reported on a dry weight basis.

Note: 8010/8020 analyte list reported.
NA = Not Applicable.

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/25/93
Alpha Analytical Number: GTE102093-01
Client I.D. Number: NWD-3A

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	80.0 ug/Kg
2. Alpha-BHC	ND	80.0 ug/Kg
3. Beta-BHC	ND	80.0 ug/Kg
4. Delta-BHC	ND	80.0 ug/Kg
5. Gamma-BHC (lindane)	ND	80.0 ug/Kg
6. Chlordane	ND	800.0 ug/Kg
7. Dieldrin	ND	160.0 ug/Kg
8. Endosulfan I	ND	800.0 ug/Kg
9. Endosulfan II	ND	160.0 ug/Kg
10. Endosulfan sulfate	ND	160.0 ug/Kg
11. Endrin	ND	160.0 ug/Kg
12. 4,4'-DDD	ND	160.0 ug/Kg
13. 4,4'-DDE	270	160.0 ug/Kg
14. 4,4'-DDT	270	160.0 ug/Kg
15. Heptachlor	ND	80.0 ug/Kg
16. Heptachlor epoxide	ND	80.0 ug/Kg
17. Methoxychlor	ND	800.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	800.0 ug/Kg
20. Aroclor-1221	ND	800.0 ug/Kg
21. Aroclor-1232	ND	800.0 ug/Kg
22. Aroclor-1242	ND	800.0 ug/Kg
23. Aroclor-1248	ND	800.0 ug/Kg
24. Aroclor-1254	ND	800.0 ug/Kg
25. Aroclor-1260	ND	800.0 ug/Kg

ND - Not Detected

Date: 10/27/93

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/25/93
Alpha Analytical Number: GTE102093-02
Client I.D. Number: NWD-3B

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	80.0 ug/Kg
2. Alpha-BHC	ND	80.0 ug/Kg
3. Beta-BHC	ND	80.0 ug/Kg
4. Delta-BHC	ND	80.0 ug/Kg
5. Gamma-BHC (lindane)	ND	80.0 ug/Kg
6. Chlordane	ND	800.0 ug/Kg
7. Dieldrin	ND	160.0 ug/Kg
8. Endosulfan I	ND	800.0 ug/Kg
9. Endosulfan II	ND	160.0 ug/Kg
10. Endosulfan sulfate	ND	160.0 ug/Kg
11. Endrin	ND	160.0 ug/Kg
12. 4,4'-DDD	ND	160.0 ug/Kg
13. 4,4'-DDE	ND	160.0 ug/Kg
14. 4,4'-DDT	260	160.0 ug/Kg
15. Heptachlor	ND	80.0 ug/Kg
16. Heptachlor epoxide	ND	80.0 ug/Kg
17. Methoxychlor	ND	800.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	800.0 ug/Kg
20. Aroclor-1221	ND	800.0 ug/Kg
21. Aroclor-1232	ND	800.0 ug/Kg
22. Aroclor-1242	ND	800.0 ug/Kg
23. Aroclor-1248	ND	800.0 ug/Kg
24. Aroclor-1254	ND	800.0 ug/Kg
25. Aroclor-1260	ND	800.0 ug/Kg

ND - Not Detected

Approved By: Roger S. Scholl Ph.D. Date: 10/27/93

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/21/93
Alpha Analytical Number: GTE102093-03
Client I.D. Number: WSR-5

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	25	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	26	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

Std 4 ppm

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.

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ANALYTICAL REPORT

G Tel Labs
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Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/21/93
Alpha Analytical Number: GTE102093-04
Client I.D. Number: WSR-4

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	39	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	22	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/21/93
Alpha Analytical Number: GTE102093-05
Client I.D. Number: WSR-3

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	95	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	38	16.0 ug/Kg
14. 4,4'-DDT	34	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.
Laboratory Director

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/22/93
Alpha Analytical Number: GTE102093-06
Client I.D. Number: WSR-2

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	16	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	ND	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/22/93
Alpha Analytical Number: GTE102093-07
Client I.D. Number: WSR-1

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	27	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	ND	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
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1-800-283-1183

Boise, Idaho
(208) 336-4115

2810 W. Charleston, Suite G67
Las Vegas, Nevada 89102
(702) 386-6737

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/22/93
Alpha Analytical Number: GTE102093-08
Client I.D. Number: NWD-1A

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	29	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	ND	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.
Laboratory Director

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ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/22/93
Alpha Analytical Number: GTE102093-09
Client I.D. Number: NWD-1B

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	ND	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	ND	16.0 ug/Kg
14. 4,4'-DDT	ND	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
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Las Vegas, Nevada 89102
(702) 386-6747

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/25/93
Alpha Analytical Number: GTE102093-10
Client I.D. Number: NWD-2A

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	80.0 ug/Kg
2. Alpha-BHC	ND	80.0 ug/Kg
3. Beta-BHC	140	80.0 ug/Kg
4. Delta-BHC	ND	80.0 ug/Kg
5. Gamma-BHC (lindane)	ND	80.0 ug/Kg
6. Chlordane	ND	800.0 ug/Kg
7. Dieldrin	ND	160.0 ug/Kg
8. Endosulfan I	ND	800.0 ug/Kg
9. Endosulfan II	ND	160.0 ug/Kg
10. Endosulfan sulfate	ND	160.0 ug/Kg
11. Endrin	ND	160.0 ug/Kg
12. 4,4'-DDD	ND	160.0 ug/Kg
13. 4,4'-DDE	300	160.0 ug/Kg
14. 4,4'-DDT	330	160.0 ug/Kg
15. Heptachlor	ND	80.0 ug/Kg
16. Heptachlor epoxide	ND	80.0 ug/Kg
17. Methoxychlor	ND	800.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	800.0 ug/Kg
20. Aroclor-1221	ND	800.0 ug/Kg
21. Aroclor-1232	ND	800.0 ug/Kg
22. Aroclor-1242	ND	800.0 ug/Kg
23. Aroclor-1248	ND	800.0 ug/Kg
24. Aroclor-1254	ND	800.0 ug/Kg
25. Aroclor-1260	ND	800.0 ug/Kg

std 4ppm

std. 2ppm

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/27/93
Roger L. Scholl, Ph.D.
Laboratory Director

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Las Vegas, Nevada 89102
(702) 386-6771

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C3100278
Phone:
Attn:

Sampled: 10/11/93 Received: 10/20/93 Analyzed: 10/22/93
Alpha Analytical Number: GTE102093-11
Client I.D. Number: NWD-2B

Chlorinated Pesticides and PCB's
EPA Method 608/8080

Compound	Concentration ug/Kg	Detection Limit
1. Aldrin	ND	8.0 ug/Kg
2. Alpha-BHC	ND	8.0 ug/Kg
3. Beta-BHC	27	8.0 ug/Kg
4. Delta-BHC	ND	8.0 ug/Kg
5. Gamma-BHC (lindane)	ND	8.0 ug/Kg
6. Chlordane	ND	80.0 ug/Kg
7. Dieldrin	ND	16.0 ug/Kg
8. Endosulfan I	ND	8.0 ug/Kg
9. Endosulfan II	ND	16.0 ug/Kg
10. Endosulfan sulfate	ND	16.0 ug/Kg
11. Endrin	ND	16.0 ug/Kg
12. 4,4'-DDD	ND	16.0 ug/Kg
13. 4,4'-DDE	26	16.0 ug/Kg
14. 4,4'-DDT	35	16.0 ug/Kg
15. Heptachlor	ND	8.0 ug/Kg
16. Heptachlor epoxide	ND	8.0 ug/Kg
17. Methoxychlor	ND	80.0 ug/Kg
18. Toxaphene	ND	160.0 ug/Kg
19. Aroclor-1016	ND	80.0 ug/Kg
20. Aroclor-1221	ND	80.0 ug/Kg
21. Aroclor-1232	ND	80.0 ug/Kg
22. Aroclor-1242	ND	80.0 ug/Kg
23. Aroclor-1248	ND	80.0 ug/Kg
24. Aroclor-1254	ND	80.0 ug/Kg
25. Aroclor-1260	ND	80.0 ug/Kg

ND - Not Detected

Approved By: Roger E. Scholl Date: 10/27/93
Roger E. Scholl, Ph.D.

ATTACHMENT 2

ANALYTICAL RESULTS

Volatile Organics in Water

EPA Method 8240[a]

GTEL Sample Number		01	02	03	041994 MSC-1
Client Identification		M-10	M-47	M-48	METHOD BLANK
Date Sampled		04/18/94	04/18/94	04/18/94	--
Date Analyzed		04/19/94	04/19/94	04/19/94	04/19/94
Analyte	Quantitation Limit, ug/L	Concentration, ug/L			
Chloromethane	10	<10	<10	<10	<10
Bromomethane	10	<10	<10	<10	<10
Vinyl chloride	10	<10	<10	<10	<10
Chloroethane	10	<10	<10	<10	<10
Methylene chloride	5	<5	<5	<5	<5
Acetone	20	<20	<20	<20	<20
Carbon disulfide	5	<5	<5	<5	<5
1,1-Dichloroethene	5	<5	<5	<5	<5
1,1-Dichloroethane	5	<5	<5	<5	<5
1,2-Dichloroethene, total	5	<5	<5	<5	<5
Chloroform	5	34	280	340	<5
1,2-Dichloroethane	5	<5	<5	<5	<5
2-Butanone	20	<20	<20	<20	<20
1,1,1-Trichloroethane	5	<5	<5	<5	<5
Carbon tetrachloride	5	<5	<5	<5	<5
Vinyl acetate	50	<50	<50	<50	<50
Bromodichloromethane	5	<5	<5	<5	<5
1,2-Dichloropropane	5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5	<5	<5	<5	<5
Trichloroethene	5	<5	<5	<5	<5
Dibromochloromethane	5	<5	<5	<5	<5
1,1,2-Trichloroethane	5	<5	<5	<5	<5

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986 (method modified for additional compounds). Sample introduction by EPA Method 5030.

ANALYTICAL RESULTS

Volatile Organics in Water

EPA Method 8240[a]

GTEL Sample Number		01	02	03	041994 MSC-1
Client Identification		M-10	M-47	M-48	METHOD BLANK
Date Sampled		04/18/94	04/18/94	04/18/94	--
Date Analyzed		04/19/94	04/19/94	04/19/94	04/19/94
Analyte	Quantitation Limit, ug/L	Concentration, ug/L			
Benzene	5	<5	<5	<5	<5
trans-1,3-Dichloropropene	5	<5	<5	<5	<5
2-Chloroethylvinyl ether	10	<10	<10	<10	<10
Bromoform	5	<5	9	<5	<5
4-Methyl-2-pentanone	20	<20	<20	<20	<20
2-Hexanone	20	<20	<20	<20	<20
Tetrachloroethene	5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5	<5	<5	<5	<5
Toluene	5	<5	<5	<5	<5
Chlorobenzene	5	<5	<5	<5	<5
Ethylbenzene	5	<5	<5	<5	<5
Styrene	5	<5	<5	<5	<5
1,2-Dichlorobenzene	5	<5	<5	8	<5
1,3-Dichlorobenzene	5	<5	<5	<5	<5
1,4-Dichlorobenzene	5	<5	<5	<5	<5
Xylene, total	5	<5	<5	<5	<5
Trichlorofluoromethane	5	<5	<5	<5	<5
Quantitation Limit Multiplier		1	1	1	1
DCE surrogate, % recovery		113	111	116	105
TOL surrogate, % recovery		96.9	90.0	93.0	101
BFB surrogate, % recovery		97.5	105	107	93.7

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986 (method modified for additional compounds). Sample introduction by EPA Method 5030.

ANALYTICAL RESULTS

RCRA Metals in Water

GTEL Sample Number			01	02	03	042094 MET
Client Identification			M-10	M-47	M-48	METHOD BLANK
Date Sampled			04/18/94	04/18/94	04/18/94	--
Date Prepared (Method 3005[a])			04/20/94	04/20/94	04/20/94	04/20/94
Date Analyzed (Method 6010)			04/20/94	04/20/94	04/20/94	04/20/94
Date Analyzed (Method 7060, 7421, 7740)			04/22/94	04/22/94	04/22/94	04/22/94
Date Prepared and Analyzed (Method 7470)			04/21/94	04/21/94	04/21/94	04/21/94
Analyte	EPA Method[a]	Detection Limit, ug/L	Concentration, ug/L			
Arsenic	EPA 7060[c]	5	<5	180	200	<5
Barium	EPA 6010[b]	5	15	20	20	<5
Cadmium	EPA 6010[b]	5	<5	<5	<5	<5
Chromium, total	EPA 6010[b]	10	<10	1500	1600	<10
Lead	EPA 7421[c]	5	<5	<5	<5	<5
Mercury	EPA 7470[d]	0.4	<0.4	<0.4	<0.4	<0.4
Selenium[e]	EPA 7740[c]	5	<5	<5	<5	<5
Silver	EPA 6010[b]	10	<10	<10	<10	<10
Manganese	EPA 6010[b]	5	240	44	94	<5
Detection Limit Multiplier			1	1	1	1

std (matrix) 50 ppb

std (matrix) 100 ppb

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986.
b. Inductively Coupled Argon Plasma(ICP)
c. Graphite Furnace Atomic Absorption (GFAA)
d. Cold Vapor Atomic Absorption (CVAA)
e. Matrix spike recovery for this analyte demonstrated matrix effect. Laboratory control sample indicated that the analysis was within control limits.

ANALYTICAL RESULTS
Matrix: Water

				Sample Number	01	02	03	042094
				Sample Identification	M-10	M-47	M-48	METHOD BLANK
				Date Sampled	04/18/94	04/18/94	04/18/94	--
Test Description	Units	Detection Limit	Method	Date Analyzed	Test Result			
Cyanide	ug/L	10	EPA 335.2	04/20/94	<10	<10	<10	<10

Note: Test Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, March, 1983.

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Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C4050458
Phone: 510 685-7852
Attn: Susan Crowley

Sampled: 05/25/94 Received: 05/28/94 Analyzed: 06/02/94
Alpha Analytical Number: GTE052894-01
Client I.D. Number: M-10

PCB's
EPA Method 608/8080

Compound	Concentration ug/L	Detection Limit
1. Aroclor-1016	ND	0.5 ug/L
2. Aroclor-1221	ND	0.5 ug/L
3. Aroclor-1232	ND	0.5 ug/L
4. Aroclor-1242	ND	0.5 ug/L
5. Aroclor-1248	ND	0.5 ug/L
6. Aroclor-1254	ND	0.5 ug/L
7. Aroclor-1260	ND	0.5 ug/L

ND - Not Detected

Approved By: Roger L. Scholl Date: 6/3/94
Roger L. Scholl, Ph.D.
Laboratory Director

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(208) 336-4145

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(702) 386-6747

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C4050458
Phone: 510 685-7852
Attn: Susan Crowley

Sampled: 05/25/94 Received: 05/28/94 Analyzed: 06/02/94
Alpha Analytical Number: GTE052894-02
Client I.D. Number: M-47

PCB's
EPA Method 608/8080

Compound	Concentration ug/L	Detection Limit
1. Aroclor-1016	ND	0.5 ug/L
2. Aroclor-1221	ND	0.5 ug/L
3. Aroclor-1232	ND	0.5 ug/L
4. Aroclor-1242	ND	0.5 ug/L
5. Aroclor-1248	ND	0.5 ug/L
6. Aroclor-1254	ND	0.5 ug/L
7. Aroclor-1260	ND	0.5 ug/L

ND - Not Detected

Approved By: Roger L. Scholl Date: 6/3/94
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
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Sparks, Nevada 89431
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FAX 702-355-0406
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Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

G Tel Labs
4080 Pike Ln.
Concord, CA 94520

Job#: C4050458
Phone: 510 685-7852
Attn: Susan Crowley

Sampled: 05/25/94 Received: 05/28/94 Analyzed: 06/02/94
Alpha Analytical Number: GTE052894-03
Client I.D. Number: M-48

PCB's
EPA Method 608/8080

Compound	Concentration ug/L	Detection Limit
1. Aroclor-1016	ND	0.5 ug/L
2. Aroclor-1221	ND	0.5 ug/L
3. Aroclor-1232	ND	0.5 ug/L
4. Aroclor-1242	ND	0.5 ug/L
5. Aroclor-1248	ND	0.5 ug/L
6. Aroclor-1254	ND	0.5 ug/L
7. Aroclor-1260	ND	0.5 ug/L

ND - Not Detected

Approved By: Roger L. Scholl Date: 6/3/94
Roger L. Scholl, Ph.D.
Laboratory Director

B03

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

July 18, 1995

Mr. Richard A. Simon
ENSR Consulting & Engineering
1220 Anenida Acaso
Camarillo, CA 93012

Subject: Environmental Conditions Assessment - Phase II
Consultant Selection

Dear Mr. Simon:

Kerr-McGee Chemical Corporation (KMCC) is entering Phase II of an Environmental Conditions Assessment, under the direction of Nevada Division of Environmental Protection (NDEP). We are pleased to inform you that after evaluating several consultant proposals, KMCC has selected your firm to assist us in the Phase II effort.

As KMCC has considered the scope of Phase II work, we have reevaluated the role that we wish the consultant to take. Originally, it was expected that the consultant would review the Work Plan, observe the field work, evaluate the data and prepare the Phase II document for KMCC's submission to NDEP. KMCC expected to contract the drilling firm and make arrangements for sampling. We wish to discuss with you the possibility of ENSR contracting the drilling firm and arranging for the sampling. KMCC would observe the sampling effort. The lab would still be contracted directly through KMCC. Please call me to discuss this alternative to the original scope of work.

Although much of your work can be done in your home offices, it would be beneficial for you to make a site visit to the Henderson facility. This visit will assist you in review of the Work Plan as well as give those working on the project a visualization of the facility magnitude and conditions.

Attached to the Request for Proposal, and here for your convenience, is a draft copy of the contract that will establish the basis for our working relationship. Please review this contract and advise me of any modifications ENSR requires. Following contract negotiations, KMCC will forward a signed contract for your signature and return.

Our goal is to have the Work Plan final draft ready for NDEP when the KMCC Phase II Consent Agreement is ready to sign, sometime in early September. In addition, we expect that approval of the Work Plan will follow quickly and field work will begin during the last quarter of 1995.

I look forward to working with you. If you have any questions please feel free to call me at (702) 651-2234. Thank you.

Sincerely,

KERR-McGEE CHEMICAL CORPORATION

Susan M. Crowley
Susan M. Crowley
Staff Environmental Specialist

smc/ph2con
cc: PSCorbett
PRDemps
RHJones
RANapier
TWReed
Alan Biaggi (NDEP)

ED

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

July 28, 1994

Mr. Allen Biaggi
State of Nevada
Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89710

RE: First Half, 1994 Semi-Annual Performance Report: Chromium Mitigation Program

Dear Mr. Biaggi:

Enclosed please find two copies of the first half, 1994 Semi-annual Chromium Mitigation Program report for the Kerr-McGee Chemical Corporation, Henderson facility.

This report presents groundwater monitoring and treatment results along with information regarding the upgrading of the groundwater treatment plant and recharge trenches.

If you have any questions or comments concerning this information, please contact Susan M. Crowley at (702) 651-2234.

Sincerely,

Patrick S. Corbett
Plant Manager

cc: S. M. Crowley
W. J. Ganus
T. W. Reed
J. C. Stauter

Rob K.

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

June 19, 1995

Patrick Corbett
Kerr-McGee Chemical Corporation
P.O. Box 66
Henderson, Nevada 89009

Dear Mr. Corbett:

The Nevada Division of Environmental Protection has completed the permitting process for the injection/ recharge trenches located at the Kerr-McGee facility in Henderson, Nevada. No significant comments were received during the 30-day public comment period. Enclosed is a signed copy of permit #NEV94218.

Please read the permit thoroughly and pay particular attention of Part I.A. The annual fees for this permit are $1150.00 and are due commencing **July 15, 1996**. No fees are due in 1995 because this is the year the permit was issued. Since annual fee submittal is a permit condition, no additional statements or reminders will be sent.

Should you have any questions or comments regarding the public notice process or the permit, please feel free to contact me at (702) 687-4670, ex. 3146.

Sincerely,

Marcia Manley

Marcia Manley
UIC Program Manager
Bureau of Water Pollution Control

MG/hs:30
Enclosure
cc: Jeff Dennison

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO INJECT

In compliance with the provisions of the Nevada Revised Statutes and the Nevada Underground Injection Control Regulations,

Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009

is authorized to inject into 1-2 injection/recharge trenches located at:

The Kerr-McGee Chemical Corp. facility
8000 West Lake Mead Drive
Henderson, Nevada, in the NW¼ of
Section 12, T.22S., R.62E., MDB&M
Latitude: 36° 02' 95" N.
Longitude: 115° 00' 21" W.

in accordance with

limitations, requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective *June 19, 1995.*

This permit shall expire at midnight, *June 19, 2000.*

Signed this *19th* day of *June, 1995*.

Marcia Manley

Marcia Manley, EMS III
UIC Program Manager
Bureau of Water Pollution Control

MG/hs:30

PART I

A. EFFLUENT LIMITATIONS, MONITORING AND OTHER REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to inject treated ground water into a maximum of 2 injection/recharge trenches located at the Kerr-McGee Chemical Corp. facility in Henderson, Nevada.

2. Extraction, conveyance, and injection must be accomplished in such a way so as to prevent the introduction of any foreign materials or unapproved additives to the injectate waters. No chemical additives shall be added to the waters prior to injection or disposal without prior written approval by the Division.

3. The injectate shall be monitored by the permittee as specified below and reported according to Part I.A.9.

Parameter	Frequency	Location
Total and Hexavalent Chromium	Weekly and averaged over the month.	Discharge pipe prior to injection.
Water Levels	Quarterly	Monitoring wells M-80, M-82, M-86, M-47, M-23 and M-49

The detection limits for all chemical constituents must be at least as low as primary or secondary drinking water standards when applicable. The Division may decrease or increase the monitoring of any parameter for good cause.

4. The injection shall be limited by the permittee to treated ground water from the chromium electrolitic process as specified below:

Hexavalent Chromium - Monthly average 0.05 ppm
Total Chromium - Monthly average 1.71 ppm

5. Monitoring and system management shall continue for a period of not less than 1 year following system shut-down approval. The Division may elect to approve system shut-down after monitoring by the permittee has demonstrated that contaminants have been removed to within specified limits within the ground water aquifer. A decision regarding site closure shall be considered after the 1-year monitoring period.

6. The permittee shall operate and maintain the system per established procedures and as approved by the Division. Any modification to the system requires Division approval prior to implementation.

7. Nothing in this authorization shall be construed to eliminate the responsibility for cleanup of this area. Cleanup shall be accomplished in accordance with plans approved by the Division of Environmental Protection.

8. All facilities encompassed by this permit shall conform to the plans and specifications filed with the Division of Environmental Protection and shall be maintained in good working order at all times.

9. The permittee shall submit semi-annual reports which contain the following data:

   a. The results of the chemical analyses as required by Part I.A.3.

   b. Summary narrative report of monitoring activities for that reporting period. The report shall include, but not be limited to, any problems encountered with the system, the results of any tests performed during that period, and any changes noted to the ground water.

10. The permittee shall submit the annual review and services fee in accordance with NAC 445A.872 no later than July 15, 1996 of every year until such time as the permit is terminated.

11. The permittee shall comply with all provisions of the UIC regulations, Nevada Administrative Code 445A.810 through 445A.925, and all pertinent laws and regulations. Nothing in this permit relieves the permittee from responsibilities, liabilities or penalties established by any other State, federal or local jurisdiction or as specified in the Consent Agreement filed regarding remediation.

B. MONITORING AND REPORTING

1. Samples and measurements taken as required herein shall be representative of the volume and/or nature of the subject of interest.

2. Test Procedures

Test Procedures for the analysis of the constituents listed in Attachment A shall conform to regulations (40 CFR, Part 136) published pursuant to Section 304(h) of the Clean Water Act, under which such procedures may be required, unless other procedures are approved by the Administrator. Analyses shall be performed by a laboratory certified by the State of Nevada.

3. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. the exact place, date, and time of sampling;

b. the dates the analyses were performed;

c. the person(s) who performed the analyses;

d. the analytical techniques or methods used;

e. the results of all required analyses; and

f. the precision and accuracy of the analytical data.

4. Reporting

Monitoring results and other requirements obtained during the previous reporting period shall be summarized for each month and reported no later than the 28th day of the month following the completed reporting period. Signed copies of these, and all other reports required herein, shall be submitted to the UIC Program Officer at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control/UIC
333 W. Nye Lane
Capitol Complex
Carson City, Nevada 89710

5. Additional Monitoring by Permittee

If the permittee monitors any constituent at the locations(s) designated herein more frequently than required by this permit, or monitors additional constituents other than those required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be made available to the Division upon request.

6. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records and analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three years, or longer if required by the Administrator.

7. Modification of Monitoring Frequency, Location and Sample Type

After considering monitoring data, stream flow, discharge flow or receiving water conditions, the Division may, for just cause, modify the monitoring frequency, location and/or sample type by written notice or by issuing an Order to the permittee.

PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Effluents or Discharge

All effluents or discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any constituent 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 effluents or discharges must be reported by submission of a new application or, if such changes will not violate the limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any constituents not previously limited.

2. Noncompliance/Violation Notification

If, for any reason, the permittee does not comply with or will be unable to comply with the conditions, requirements and limitations specified in this permit, or with any law or regulation, the permittee shall provide the Administrator or his representative with the following:

a. A description of the noncompliance or violation; and

b. The period of noncompliance, including exact dates and times, or if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncompliance.

Notification shall be provided verbally as soon as possible but no later than the end of the first working day after the violation and in writing within five (5) days of becoming aware of such conditions.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible, all treatment or control facilities, devices or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. Adverse Impact

The permittee shall take all reasonable steps, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying effluent or discharge, to minimize any adverse impact to waters of the State resulting from noncompliance with any limitations specified in this permit.

5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited except where unavoidable to prevent loss of life or severe property damage. The Division will have the final authority in the determination of whether a discharge is deemed unavoidable. The permittee shall promptly notify the Administrator in writing, of each such diversion or bypass, in accordance with the procedure specified in Part II.A.2 above.

B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where a source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. To have access to, and to copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to perform any necessary sampling to determine compliance with this permit or to sample any effluent or discharge.

2. Transfer of Ownership or Control

In the event of any change in control or ownership, the permittee shall notify the succeeding owner or controller in writing of the existence of this permit. A copy of said notice shall be forwarded to the Administrator within 10 days of such change. All transfer of permits shall be approved by the Administrator of the Division of Environmental Protection.

3. Availability of Reports

Except for data determined to be confidential under NRS 445.311, all reports prepared in accordance with the terms of this permit shall be available for public inspection. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445.337.

4. Permit Modification, Suspension or Revocation

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:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the effluent or discharge.

5. Civil and Criminal Liability

a. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

b. 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 State law or regulation.

c. 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.

PART III

A. Schedule of Compliance

1. The permittee shall achieve compliance with the conditions, limitations and requirements of the permit at the commencement of relevant activity.

2. The Administrator may, upon the request of the permittee, and after public notice, revise or modify a schedule of compliance in an issued permit if he determines good and valid cause (such as an act of God, a strike, materials shortage or other event over which the permittee has little or no control) exists for such revision.

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

June 9, 1994

Ms. Sylvia Harrison, Esq.
McDonald, Carano, Wilson
McCune, Bergin, Frankovich & Hicks
P.O. Box 2670
Reno, Nevada 89505-2670

Subject: Former State Industries Plant Site, BMI Complex, Henderson, Nevada

Dear Ms. Harrison:

You should by now have received copies of the Kerr-McGee and BMI Common Areas Phase I Environmental Conditions Assessment reports as well as the ETN sampling plan for the former State Industries site at BMI. In response to your request for a copy of the latest version of the draft letter of understanding (LOU) between Kerr-McGee and NDEP, I must inform you that it is NDEP's opinion that it would be inappropriate to release this document while it is still in draft form. What I can provide is that portion of the draft Kerr-McGee LOU which concerns the former State Industries site. Please understand that the following passage is in draft form and is therefore subject to modification:

62) *State Industries, Inc. Site, Including Impoundments and Catch Basin:*

Provide a work plan for the complete assessment/characterization of the State Industries surface impoundments. Analytes should be selected based upon known or suspected waste streams disposed to these ponds and should include TCLP metals, volatile organic compounds (if applicable), TPH (if applicable), and pH.

Please feel free to contact either myself or Allen Biaggi at 687-4670, extensions 3017 and 3021, respectively should you require further assistance.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

cc: Allen Biaggi, NDEP

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

PETER G. MORROS
Director

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

June 3, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: Final Draft, Letter of Understanding Between NDEP and Kerr-McGee Chemical Corporation (KMCC)

Dear Ms. Crowley:

The language of the enclosed "Final Draft" LOU incorporates the modifications to item #4, Hardesty Chemical Company Site, proposed in Mr. Patrick Corbett's letter dated May 27, 1994. A copy of this final draft is being forwarded to the State Attorney General's office for final review. I do not anticipate any significant modifications resulting from that review, however. Should any major changes be required, KMCC will of course be consulted. The LOU will be issued in final (Letterhead) form upon approval by the AG's office.

The items in the LOU will be incorporated into the Phase II Consent Agreement as an attachment or an appendix. Upon circulation of the draft consent agreement for company review, KMCC will have an additional opportunity to review the language of the LOU items.

Please feel free to contact me at (702) 687-4670 extension 3017 should you have any questions.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

Enclosure
cc: See attached list

cc/enc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

w/o enclosure:

Kent Hanson, Deputy Attorney General, NDEP

Allen Biaggi, NDEP

ED - AS I UNDERSTAND IT THIS HAS BEEN PROVIDED? AB

THE LAW FIRM OF
MCDONALD CARANO WILSON MCCUNE
BERGIN FRANKOVICH & HICKS

Sylvia Harrison, Esq. **Reply to: Reno**

June 3, 1994

Allen Biaggi
Nevada Division of Environmental
Protection
123 West Nye
Carson City, NV 89710

Re: State Industries - BMI Site

Dear Allen:

As we discussed recently on the telephone, State Industries, Inc. has asked me to assist it in determining its legal and technical options at the BMI site in Henderson, Nevada. Specifically, it is evaluating whether it will be best served by assuming more direct involvement in any necessary investigation and remediation of the property it had leased from Kerr McGee. Its ability to do so will of course depend on the acquiescence of both Kerr McGee and NDEP.

I would appreciate it if you could provide me a copy of the latest draft of the letter of understanding between Kerr McGee and the State, assuming you can legally do so. I would also appreciate it if you could let me know when and if you or Ed Basham may be travelling to the site and if it would be convenient to arrange a "Cook's tour." I spoke with Brenda Pullman at your suggestion, but she did not feel she had sufficient contact with the project to be of much help.

As always, I appreciate your assistance and cooperation.

Very truly yours,

Sylvia Harrison

cc: Catherine Marks, Esq.

S\STATE\BIAGGI.LTR/SH:cb

241 RIDGE STREET, 4TH FLOOR
P.O. BOX 2670
RENO, NEVADA 89505-2670
TELEPHONE 702-322-0635
FAX 702-786-9532

OF COUNSEL
DONALD L. CARANO
WILLIAM S. BOYD
CHARLES E. HUFF
HON. JAMES GUINAN, RET.

2300 WEST SAHARA AVENUE
NO. 10, SUITE 1000
LAS VEGAS, NEVADA 89102
TELEPHONE 702-873-4100
FAX 702-873-9966

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

June 1, 1994

Edward L. Basham
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

Dear Mr. Basham:

SUBJECT: Kerr-McGee (KMCC) Facility, AutoCad (DXF) Map

On May 2, 1994, you requested an Auto Cad map of the Henderson facility. Enclosed is an AutoCad map in both hard and electronic formats. This map was provided as Plate 1 in support of the report, "Groundwater Interception System Evaluation Report for the Henderson, Nevada Facility", dated September 15, 1993.

Please be advised that the well locations on this map are approximate. They have not been located via surveying. Please contact me at (702) 651-2234, if you have questions regarding this information.

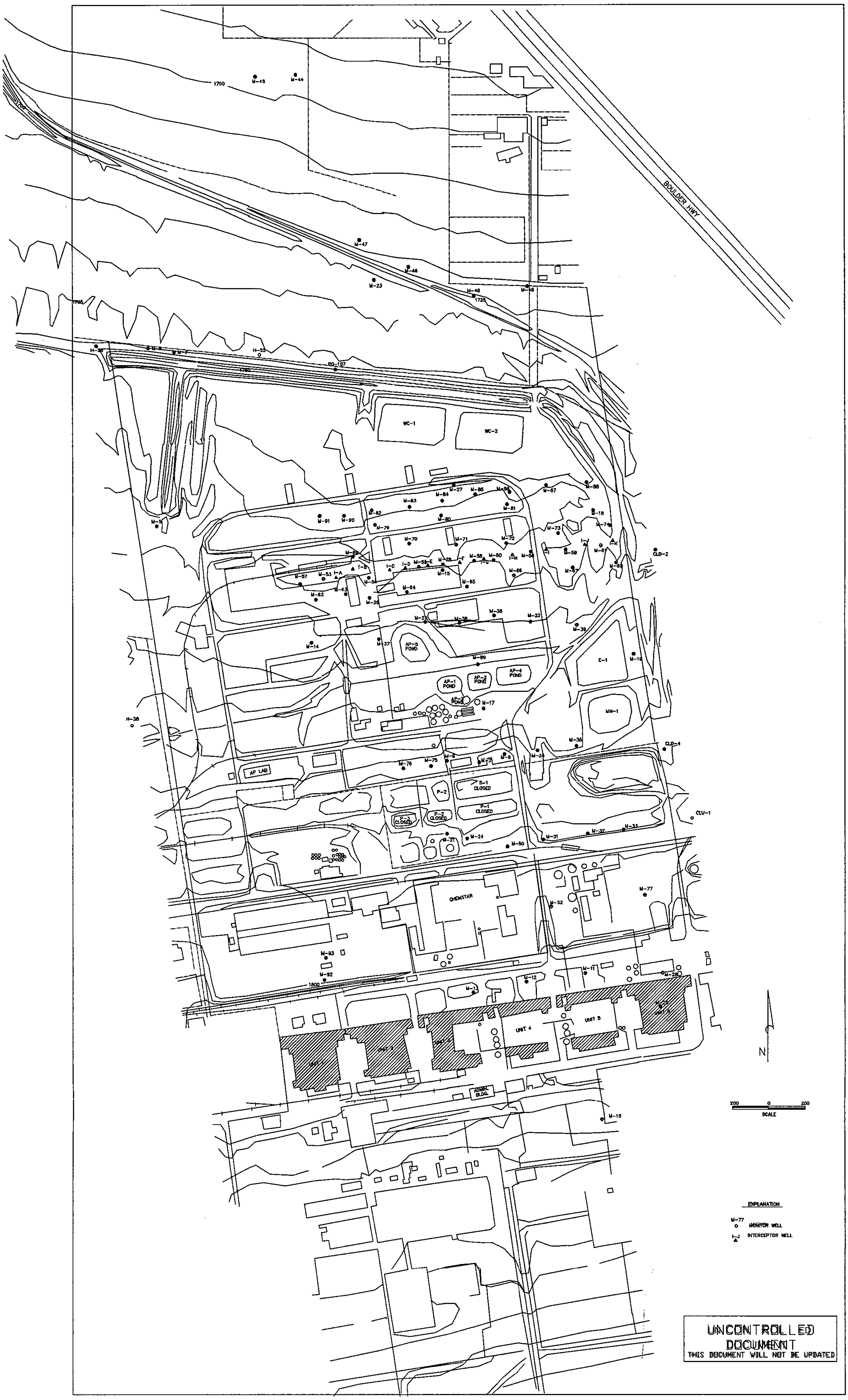
Sincerely,

Susan Crowley

S.M. Crowley
Staff Environmental Specialist

smc\ndepcad

cc: PSCorbett
PRDemps
RHJones
TWReed
JCStauter


BOULDER HWY
1700
1725
1750
1800
WC-1
WC-2
AP-5 POND
AP-1 POND
AP-2 POND
AP-4 POND
C-1
MN-1
AP LAB
P-2
S-1 CLOSED
P-1 CLOSED
P-3 CLOSED
P-2 CLOSED
CHEMSTAR
UNIT 4
UNIT 5
ADMIN. BLDG.
CLD-2
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CLU-1
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H-52
PC-107
M-77
M-93
M-92
M-10
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SCALE
EXPLANATION
MONITOR WELL
INTERCEPTOR WELL

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

May 27, 1994

Edward L. Basham
Bureau of Corrective Actions
Nevada Division of Environmental Protection
Capitol Complex
333 West Nye Lane
Carson City, Nevada 89710

SUBJECT: KMCC Letter of Understanding

Dear Mr. Basham:

As the BMI Letter of Understanding (LOU) language has developed into a final draft, KMCC requests that the language in our LOU Item #4 reflect the BMI LOU language for the same subject.

We propose the language of Item #4 in the KMCC LOU be modified as follows:

4) Hardesty Chemical Company Site:

Provide analytical data obtained from sampling of the ground water monitoring wells installed on the J.B. Kelley lease site. Although these wells were installed for the evaluation of potential hydrocarbon contamination from the underground storage tanks formerly located at the J.B. Kelley site, they are in the area where Hardesty carried out operations. NDEP may request additional sampling of these wells with an expanded list of analytes.

KMCC will provide NDEP with any additional information regarding the past operation of Hardesty Chemical Company at the KMCC facility which may be reasonably available, including facility locations, products, waste streams, and waste disposal. KMCC ***and NDEP will then determine what additional investigatory work is necessary based upon the identified information concerning the activities of Hardesty at the KMCC site.***

Please contact S.M. Crowley at(702)651-2234, if you have any questions. Thank you.

Sincerely,

Patrick S. Corbett
Plant Manager

smc\basham

cc: RHJones
PRDemps
JCStauter

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
Carson City, Nevada 89710

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

March 24, 1994

SUSAN CROWLEY
KERR-MCGEE CHEMICAL CORPORATION
PO BOX 55
HENDERSON NEVADA 89009-7000

Subject: Request to include diesel storage tank in Phase II Work Plan

Dear Ms. Crowley:

The NDEP has reviewed your March 17, 1995 request to include an investigation of the former diesel storage tank (Item 45 of the Letter of Understanding (LOU)) in the overall Phase II Work Plan. The NDEP is in agreement with that request, and hereby waives the requirement to submit a separate work plan within 180 days of the effective date of the LOU.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021, respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso
Environmental Engineer
Bureau of Corrective Actions

RCK:kmf

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005
Kent Hanson, Deputy Attorney General, NDEP
Allen Biaggi, NDEP

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

Address Reply to:
Capitol Complex
Carson City, NV 89710

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities
Facsimile 885-0868

Air Quality
Water Quality Planning
Facsimile 687-6396

Located at:
333 W. Nye Lane
Carson City, NV 89710

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

Carson City, Nevada 89710

May 11, 1995

Patrick Corbett
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009

Dear Mr. Corbett:

The Nevada Division of Environmental Protection has completed the drafting process for permitting of the injection/ recharge trenches located at the Kerr-McGee facility in Henderson, Nevada.

Enclosed are copies of the fact sheet, mailing list, public notice and draft permit (#NEV94218). I anticipate that the Las Vegas Review-Journal will issue the public notice no later than May 26, 1995.

Should you have any questions or comments regarding the public notice process or the permit, please feel free to contact me at (702) 687-4670, ex. 3146.

Sincerely,

Marcia Greybeck

Marcia Greybeck
UIC Program Manager
Bureau of Water Pollution Control

MG/hs:30
Enclosure
cc: Jeff Dennison

)TICE OF PROPOSED ACTION

by the

State of Nevada
Department of Conservation and Natural Resources
Division of Environmental Protection
333 West Nye Lane
Capitol Complex
Carson City, Nevada 89710

P U B L I C N O T I C E

The Administrator, Division of Environmental Protection, Department of Conservation and Natural Resources, Carson City, Nevada is issuing the following notice of proposed action under the authority of the Nevada Revised Statutes and the Safe Drinking Water Act.

The Administrator has received a request to issue underground injection control permit NEV94218 which was applied for by the following applicant:

Kerr-McGee Chemical Corporation
P.O. Box 66
Henderson, Nevada 89009

The Administrator has prepared tentative determinations regarding the permit which, in brief, are:

The applicant has undertaken remediation for chromium contamination at their Henderson processing facility. Kerr-McGee has requested a permit to inject treated ground water into 1-2 recharge trenches located on-site. Due to the chromium removal, the treated water is of better quality than the naturally occurring near surface aquifer which is the receiving formation. Monitoring will be conducted to ensure that contaminants do not migrate off-site and that soils and ground water are adequately treated.

On the basis of preliminary review of the requirements of the Nevada Revised Statutes (NRS) and the Safe Drinking Water Act, and implementing regulations, the Administrator proposes to issue permit NEV94218 as stated above.

Persons wishing to comment upon or object to the proposed determinations by the Administrator regarding permit issuance or to request a hearing pursuant to Nevada Administrative Code, Water Pollution Control, should submit their comments or request in writing, within thirty days either in person or by mail to:

UIC Program Manager
Division of Environmental Protection
Bureau of Water Pollution Control
333 West Nye Lane
Capitol Complex
Carson City, NV 89710

(over)

NEVAL DIVISION OF ENVIRONMENTAL ROTECTION

F A C T S H E E T
(pursuant to NAC 445A.874)

Permittee Name: Kerr-McGee Chemical Corporation

Permit Number: NEV94218

A. Description of Discharge

Location: The recharge trench system for injection of treated ground water is part of the chromium remediation project located at the Kerr-McGee Chemical Corporation facility at 8000 West Lake Mead Drive, Henderson, Nevada, in the $NW\frac{1}{4}$ of Section 12, T.22S., R.62E.

Characteristics: All injectate is ground water which has been treated to remove chromium contamination. Following treatment, the injectate exceeds the quality of the near surface aquifer and meets most primary drinking water standards.

B. Synopsis

Remedial action at the Kerr-McGee facility is the result of historic leaking from storage cells in the process area. Ground water is pumped from a series of recovery wells and treated by electrolitic removal. It is then injected into 1-2 recharge trenches which are located to provide a barrier for further migration of chromium. Remediation at the facility has been ongoing since 1987.

C. Receiving Water Characteristics:

The recharge trenches are designed to allow injection by gravity feed. The receiving waters are non-potable due to high total dissolved solids and other trace minerals and is not used for private or public water consumption. Total Dissolved Solids concentrations are approximately 3000 ppm. Depth to ground water is approximately 30-40 feet.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a permit authorizing the facility to discharge to the ground water of the State of Nevada, is being sent to the Las Vegas Review-Journal for publication no later than May 26, 1995.

The notice is being mailed to interested persons on our mailing list (see Attachment A). 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. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected state, any affected interstate agency, the regional administrator of EPA Region IX or any interested agency, person or group of persons.

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 will 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 445.274.

E. Proposed Determination

The Division has made the tentative determination to issue the proposed permit.

F. Proposed Effluent Limitations and Special Conditions

See Part I.A of the permit.

G. Rationale for Permit Requirements

Verification that the quality of water injected remains constant. Confirmation that injection of water does not adversely affect the existing hydrologic regime.

Prepared by: Marcia Greybeck

Date: May 11, 1995

ATTACHMENT A

UIC Permit #NEV94218

C. JAMES GANS, GENERAL MANAGER
CLARK CO. SANITATION DIST.
5857 EAST FLAMINGO ROAD
LAS VEGAS NV 89122

RICHARD D. GOEKE
PUBLIC WORKS DIRECTOR
CITY OF LAS VEGAS
400 EAST STEWART AVENUE
LAS VEGAS NV 89101

LEAGUE OF WOMEN VOTERS
ATTN D.GAYTON
2031 A CHERTSEY DRIVE
LAS VEGAS, NV 89108

JIM DEVLEN
CITY OF LAS VEGAS WATER POLLUTION
CONTROL FACILITY
6005 EAST VEGAS DRIVE
LAS VEGAS NV 89122

DARRELL RASNER
HEALTH DIVISION
BUREAU OF HEALTH PROTECTION SER.
INTER-OFFICE-MAIL

WILLIAM MOLINI, DIRECTOR
NEVADA DIVISION OF WILDLIFE
INTER-OFFICE-MAIL

DEBBIE MACKEY
ENGINEERING DIVISION
PUBLIC SERVICE COMMISSION
INTER-OFFICE-MAIL

ROSE STRICKLAND
SIERRA CLUB
P O BOX 8096
RENO NV 89507

RON JAMES
DIVISION OF HISTORIC PRESERVATION
AND ARCHEOLOGY
INTER-OFFICE-MAIL

PROJECT MANAGER
US ARMY CORPS OF ENGINEERS
C. CLIFTON YOUNG FEDERAL BLDG.
300 BOOTH ST., ROOM 2120
RENO NV 89509

NEVADA TAXPAYER'S ASSOC.
310 NORTH STEWART ST.
CARSON CITY, NV 89701

KATHLEEN SIMPSON
INTER TRIBAL COUNCIL
OF NEVADA
806 HOLMAN WAY
SPARKS, NV 89431

CARL D. SAVELY
LIONEL, SAWYER & COLLINS
300 S. FOURTH STREET
SUITE 1700
LAS VEGAS NV 89101

DAVID L HARLOW
FISH & WILDLIFE SERVICE
GREAT BASIN COMPLEX OFFICE
4600 KIETZKE LANE
BUILDING C ROOM 125
RENO NV 89502

JACOB D. BINGHAM
CHAIRMAN, CLARK COUNTY
BOARD OF COMMISSIONERS
225 EAST BRIDGER AVENUE
LAS VEGAS NV 89155

PAT SHALMY
MANAGER, CLARK COUNTY
225 EAST BRIDGER AVENUE
LAS VEGAS NV 89155

WALTER ROSS
LAS VEGAS OFFICE
INTER-OFFICE-MAIL

RICHARD B. HOLMES, DIRECTOR
CLARK COUNTY DEPARTMENT OF
COMPREHENSIVE PLANNING
225 BRIDGER 7TH FLOOR
LAS VEGAS NV 89106

CLARE SCHMUTZ
CLARK COUNTY HEALTH DISTRICT
P O BOX 4426
LAS VEGAS NV 89106

DAVID A. DONNELLY, PE..
LAS VEGAS VALLEY WATER DIST.
3700 WEST CHRLESTON BLVD.
LAS VEGAS NV 89109

MICHAEL S. WICKERSHAM
REGIONAL MANAGER
DIVISION OF WILDLIFE
INTER-OFFICEI-MAIL

COLORADO RIVER BASIN
SALINITY CONTROL FORUM
106 W 5005 STE 101
BOUNTIFUL UT 84010

DOUG KARAFA
SANITATION DISTRICT
5857 E. FLAMINGO ROAD
LAS VEGAS NV 89122

BUREAU OF RECLAMATION
P O BOX 427
BOULDER CITY NV 89005

GARY HOLLER
PUBLIC WORKS DIRECTOR
CITY OF NORTH LAS VEGAS
P O BOX 4086
NORTH LAS VEGAS NV 89030

COLORADO RIVER COMMISSION
OF NEVADA
ATTN JACK STONEHOCKER, DIR.
MAIL ROOM COMPLEX
LAS VEGAS NV 89158

LAS VEGAS COLONY
MARGARET HENRY CHAIRMAN
1 PAIUTE DRIVE
LAS VEGAS NV 89102

LAS VEGAS INDIAN CENTER INC.
2300 WEST BONANZA ROAD
LAS VEGAS NV 89106

MIKE TURNIPSEED
DIVISION OF WATER RESOURCES
INTER-OFFICE-MAIL

C.A.R.E.
HUGH I ANDERSON, III
MERRILL LYNCH
2300 W. SAHARA AVE. #1200
LAS VEGAS NV 89102-4352

CHARLIE CARTER
LAB MANAGER
LOCKEED ENGINEERING
975 KELLY JOHNSON DR.
LAS VEGAS, NV 89119

PATRICK CORBETT
KERR-MCGEE CHEMICAL CORP.
PO BOX 55
HENDERSON NV 89009

NEVADA MANUFACTURER'S ASSOC.
780 PAWNEE ST
CARSON CITY NV 89705

Permit No. NEV94218

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO INJECT

In compliance with the provisions of the Nevada Revised Statutes and the Nevada Underground Injection Control Regulations,

Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009

is authorized to inject into 1-2 injection/recharge trenches located at:

The Kerr-McGee Chemical Corp. facility
8000 West Lake Mead Drive
Henderson, Nevada, in the NW¼ of
Section 12, T.22S., R.62E., MDB&M
Latitude: 36° 02' 95" W.
Longitude: 115° 00' 21" N.

in accordance with

limitations, requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective

This permit shall expire at midnight,

Signed this_____day of_____

_____
Marcia Greybeck, EMS III
UIC Program Manager
Bureau of Water Pollution Control

MG/hs:30

PART I

A. EFFLUENT LIMITATIONS, MONITORING AND OTHER REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to inject treated ground water into a maximum of 2 injection/recharge trenches located at the Kerr-McGee Chemical Corp. facility in Henderson, Nevada.

2. Extraction, conveyance, and injection must be accomplished in such a way so as to prevent the introduction of any foreign materials or unapproved additives to the injectate waters. No chemical additives shall be added to the waters prior to injection or disposal without prior written approval by the Division.

3. The injectate shall be monitored by the permittee as specified below and reported according to Part I.A.9.

Parameter	Frequency	Location
Total and Hexavalent Chromium	Weekly and averaged over the month.	Discharge pipe prior to injection.
Water Levels	Quarterly	Monitoring wells M-80, M-82, M-86, M-47, M-23 and M-49

The detection limits for all chemical constituents must be at least as low as primary or secondary drinking water standards when applicable. The Division may decrease or increase the monitoring of any parameter for good cause.

4. The injection shall be limited by the permittee to treated ground water from the chromium electrolitic process as specified below:

Hexavalent Chromium - Monthly average 0.05 ppm
Total Chromium - Monthly average 1.71 ppm

5. Monitoring and system management shall continue for a period of not less than 1 year following system shut-down approval. The Division may elect to approve system shut-down after monitoring by the permittee has demonstrated that contaminants have been removed to within specified limits within the ground water aquifer. A decision regarding site closure shall be considered after the 1-year monitoring period.

6. The permittee shall operate and maintain the system per established procedures and as approved by the Division. Any modification to the system requires Division approval prior to implementation.

7. Nothing in this authorization shall be construed to eliminate the responsibility for cleanup of this area. Cleanup shall be accomplished in accordance with plans approved by the Division of Environmental Protection.

8. All facilities encompassed by this permit shall conform to the plans and specifications filed with the Division of Environmental Protection and shall be maintained in good working order at all times.

9. The permittee shall submit semi-annual reports which contain the following data:

   a. The results of the chemical analyses as required by Part I.A.3.

   b. Summary narrative report of monitoring activities for that reporting period. The report shall include, but not be limited to, any problems encountered with the system, the results of any tests performed during that period, and any changes noted to the ground water.

10. The permittee shall submit the annual review and services fee in accordance with NAC 445A.872 no later than July 15th of every year until such time as the permit is terminated.

11. The permittee shall comply with all provisions of the UIC regulations, Nevada Administrative Code 445A.810 through 445A.925, and all pertinent laws and regulations. Nothing in this permit relieves the permittee from responsibilities, liabilities or penalties established by any other State, federal or local jurisdiction or as specified in the Consent Agreement filed regarding remediation.

B. MONITORING AND REPORTING

1. Samples and measurements taken as required herein shall be representative of the volume and/or nature of the subject of interest.

2. Test Procedures

Test Procedures for the analysis of the constituents listed in Attachment A shall conform to regulations (40 CFR, Part 136) published pursuant to Section 304(h) of the Clean Water Act, under which such procedures may be required, unless other procedures are approved by the Administrator. Analyses shall be performed by a laboratory certified by the State of Nevada.

3. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. the exact place, date, and time of sampling;

b. the dates the analyses were performed;

c. the person(s) who performed the analyses;

d. the analytical techniques or methods used;

e. the results of all required analyses; and

f. the precision and accuracy of the analytical data.

4. Reporting

Monitoring results and other requirements obtained during the previous reporting period shall be summarized for each month and reported no later than the 28th day of the month following the completed reporting period. Signed copies of these, and all other reports required herein, shall be submitted to the UIC Program Officer at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control/UIC
333 W. Nye Lane
Capitol Complex
Carson City, Nevada 89710

5. Additional Monitoring by Permittee

If the permittee monitors any constituent at the locations(s) designated herein more frequently than required by this permit, or monitors additional constituents other than those required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be made available to the Division upon request.

6. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records and analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three years, or longer if required by the Administrator.

7. Modification of Monitoring Frequency, Location and Sample Type

After considering monitoring data, stream flow, discharge flow or receiving water conditions, the Division may, for just cause, modify the monitoring frequency, location and/or sample type by written notice or by issuing an Order to the permittee.

PART II

A. MANAGEMENT REQUIREMENTS

1. Change in Effluents or Discharge

All effluents or discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any constituent 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 effluents or discharges must be reported by submission of a new application or, if such changes will not violate the limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any constituents not previously limited.

2. Noncompliance/Violation Notification

If, for any reason, the permittee does not comply with or will be unable to comply with the conditions, requirements and limitations specified in this permit, or with any law or regulation, the permittee shall provide the Administrator or his representative with the following:

a. A description of the noncompliance or violation; and

b. The period of noncompliance, including exact dates and times, or if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncompliance.

Notification shall be provided verbally as soon as possible but no later than the end of the first working day after the violation and in writing within five (5) days of becoming aware of such conditions.

3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible, all treatment or control facilities, devices or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. Adverse Impact

The permittee shall take all reasonable steps, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying effluent or discharge, to minimize any adverse impact to waters of the State resulting from noncompliance with any limitations specified in this permit.

5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited except where unavoidable to prevent loss of life or severe property damage. The Division will have the final authority in the determination of whether a discharge is deemed unavoidable. The permittee shall promptly notify the Administrator in writing, of each such diversion or bypass, in accordance with the procedure specified in Part II.A.2 above.

B. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where a source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. To have access to, and to copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to perform any necessary sampling to determine compliance with this permit or to sample any effluent or discharge.

2. Transfer of Ownership or Control

In the event of any change in control or ownership, the permittee shall notify the succeeding owner or controller in writing of the existence of this permit. A copy of said notice shall be forwarded to the Administrator within 10 days of such change. All transfer of permits shall be approved by the Administrator of the Division of Environmental Protection.

3. Availability of Reports

Except for data determined to be confidential under NRS 445.311, all reports prepared in accordance with the terms of this permit shall be available for public inspection. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445.337.

4. Permit Modification, Suspension or Revocation

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:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the effluent or discharge.

5. Civil and Criminal Liability

a. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

b. 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 State law or regulation.

c. 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.

PART III

A. Schedule of Compliance

1. The permittee shall achieve compliance with the conditions, limitations and requirements of the permit at the commencement of relevant activity.

2. The Administrator may, upon the request of the permittee, and after public notice, revise or modify a schedule of compliance in an issued permit if he determines good and valid cause (such as an act of God, a strike, materials shortage or other event over which the permittee has little or no control) exists for such revision.

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

May 2, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: Kerr-McGee (KMCC) Facility, AutoCad (DXF) Map

Dear Ms. Crowley:

The Division is planning to evaluate the hydrology/contaminant hydrogeology of the Kerr-McGee, Henderson, Nevada facility utilizing the data which KMCC has and will in the future provide. To facilitate this evaluation, it would be very helpful to have a disk copy of KMCC's AutoCad diagram of the facility. Specifically, a disk copy of Plate 1 from the Groundwater Interception System Evaluation Report for the Henderson, Nevada Facility dated September 15, 1993 is requested.

In order for NDEP to be able to utilize an AutoCad map, it must be in **[filename].DXF format**. Finished AutoCad diagrams are typically in [filename].DWG format. NDEP is unable to utilize or convert digitized DWG drawings. Please provide the requested digitized map file in **DXF** format on a 3.5 in. 1.44 MB DS/HD or 5.25 in. 1.2 MB diskette.

Your assistance and cooperation are much appreciated. Should you have any questions, please feel free to contact me at (702) 687-4670 extension 3017.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:jm
cc: Barry Conaty, Esq., Cutler & Stanfield, 700 14th Street, N.W., Washington, D.C. 20005
Allen Biaggi, NDEP

B03
OIL Dwnr

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

March 17, 1995

Mr. Allen Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi,

SUBJECT: Out of Service Diesel Fuel Storage Tank

On Marcy 2, 1995, representatives of Kerr-McGee Chemical Corporation (KMCC) met with Robert Kelso and Jeff Dennison of the NDEP to discuss issues related to KMCC's post closure permit and its relationship to the ongoing Environmental Conditions Assessment at the site. During the discussion, KMCC noted that Item 45 in the Letter of Understanding (LOU) required that we submit a work plan designed to address visible and potential hydrocarbon contamination of soil and/or ground water associated with the former diesel storage tank. This plan was to be submitted within 180 days of the effective date of the LOU.

Since the LOU was initially prepared, KMCC has removed the storage tank. It was our intent to include this investigation with the overall Phase II work plan required by the LOU; however, due to the long lead time in finalizing the Phase II agreement, the 180 day limit has expired. During the meeting, KMCC requested that we still include this item in the Phase II work plan as opposed to submitting a separate plan. Mr. Kelso asked that we submit our request in a letter for your review and approval.

If you have any questions regarding this matter, please feel free to call me at (702) 651-2234.

Very truly yours,

Susan Crowley
S. M. Crowley

SMC:j

cc: PSCorbett
PRDemps
RHJones
GBRice
JCStauter

KMCC

3/2/95

Post Closure Rqmts

Fed. Reg 59, pg 55784 Nov 8, 94

Russ Jones
Pat Dempsey
Sue Crowley
M. Hill
R. Kass, J. Dennison

Post Closure Rqmts vs ØJ Agreements / Cal. Actions
↳ Alternatives?

Landfill Closed Prior to
Jan/Feb 84

Stopped Accept 1/83/85
Not Certified By 83?

2nd DOC BACKDATED Reg. Rqmt

KMCC operated beyond this DATE 7/26/82

Closure Document Approved By NDEP

Post closure Permit DELAYED By other investigatory activities → CAP, GTC completed.

Modify KMCC Consent to include RCRA Rqmts

Jan 93 - Mtg ⇒ (cont;) Diesel AST → Sampling Plan -180 days
Comprehensive G.W. Sampling
↳ Results submitted with Work Plan
Intended for written response to Corr

Bom

FEB 27 '95

KERR-McGEE CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

LAW DEPARTMENT

Writer's Direct No.

(405) 270-2840

February 23, 1995

CONFIDENTIAL
VIA FASCIMILE

Mr. Allen Biaggi
Division of Environmental Protection
Nevada Department of Conservation
and Natural Resources
333 West Nye Lane
Carson City, NV 89710

Re: Henderson Industrial Site

Dear Allen:

This letter responds to your request that I outline Kerr-McGee's objectives for our scheduled meeting on March 2, 1995.

In a nutshell, Kerr-McGee seeks to confirm that it will be able to use the work that it is performing pursuant to the Phase II Consent Agreement to fulfill its post-closure permitting and other requirements under RCRA. We would like to discuss in more detail, the post-closure process so that we can be assured that we are proceeding in the right direction with respect to our closed hazardous waste landfill.

If you have any other issues that you want to discuss at the meeting, please let me know in advance so that we can be better prepared to discuss them.

(Assuming we will be without colds) I look forward to meeting with you, Jeff Denison and Bob Kelso on March 2, at 11:00. I will be accompanied by Susan Crowley and Russell Jones of Kerr-McGee and Michael Hill of Covington and Burling.

Sincerely,

Patricia R. Demps

Patricia R. Demps
Staff Counsel

PRD:lpd
cc: S. Crowley
M. Hill
R. Jones

B03

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

LAW DEPARTMENT

Writer's Direct No.
(405) 270-2840

February 23, 1995

CONFIDENTIAL
VIA FASCIMILE

Mr. Allen Biaggi
Division of Environmental Protection
Nevada Department of Conservation
and Natural Resources
333 West Nye Lane
Carson City, NV 89710

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Sincerely,

Patricia R. Demps
Staff Counsel

PRD:lpd
cc: S. Crowley
M. Hill
R. Jones

KERR-McGEE CORPORATION

LAW DEPARTMENT

FACSIMILE REQUEST COVER SHEET

NAME	NAME
Allen Biaggi	Patricia R. Demps
COMPANY NAME (IF APPLICABLE)	LOCATION (BLDG. AND ROOM NO.)
Covington & Burling	MT-1004
FACSIMILE PHONE NO. CONFIRMATION PHONE NO.	PHONE NO.
8-702-885-0868	(405) 270-2840

Total number of pages (including Facsimile Request Cover Sheet) 02

REMARKS

NOTICE OF CONFIDENTIALITY

The information contained in and transmitted with this facsimile is:

1. **SUBJECT TO THE ATTORNEY-CLIENT PRIVILEGE;**
2. **ATTORNEY WORK PRODUCT; AND/OR**
3. **CONFIDENTIAL.**

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THIS SECTION TO BE COMPLETED BY OPERATOR

NOTE: PLEASE CALL ORIGINATOR AS SOON AS POSSIBLE IF TRANSMISSION IS IMPAIRED.	DAY SENT February 23, 1995	TIME SENT ___A.M. ___P.M.	OPERATOR'S NAME LaVerne Dial

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

~~March 14, 1994~~ s.b. 2/17/95

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: KMCC Proposed Phase II Consultants

Dear Ms. Crowley:

The NDEP has reviewed the list of potential consultants presented in your letter of February 7, 1995, and has no concerns with the listed corporations/individuals at the current time.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021 respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso
Environmental Engineer
Bureau of Corrective Actions

RCK:jm

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005
Kent Hanson, Deputy Attorney General, NDEP
Allen Biaggi, NDEP

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

February 7, 1995

Allen Biaggi
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Proposed List of Phase II Consultants

Dear Mr. Biaggi:

Kerr-McGee is submitting for your approval a list of consultants who will potentially be involved in the Phase II activities of the Environmental Conditions Assessment. After NDEP approval of the consultant list, KMCC will be selecting a consultant to assist in Phase II activities.

Please feel free to contact me at (702) 651-2234, if you have any question or require additional information. Thank you.

Sincerely,

Susan Crowley

Susan Crowley
Specialist

I GUESS JD WILL BE ACTING CEM FOR WESTN

AB

smc\ph2con.eca
cc: PSCorbett
PRDemps
RHJones
JCStauter

KERR-McGEE CHEMICAL CORPORATION

PROPOSED CONSULTANTS FOR PHASE II

Roy F. Weston, Inc
3 Hawthorn Parkway, Suite 400
Vernon Hills, Illinois 60061-1450
Mr. Kurt Stimson

Phone: (708) 918-4000
Fax: (708) 918-4055

CEM: John David Akenheads

ENSR Consulting & Engineering
1220 Anenida Acaso
Camarillo, CA 93012
Mr. Richard A. Simon

Phone: (805) 388-3775
Fax: (805) 388-3577

CEM: Michael Astin

Dames and Moore
127 South 500 East, Suite 300
Salt Lake City, Utah 84102-1959
Mr. J.B. Brown

CEM: Mark Foster / Mark Hallee

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

February 1, 1995

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

RE: UIC Permit Application

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has reviewed the application submitted December 22, 1994, regarding injection at the Kerr-McGee facility in Henderson, Nevada. The completeness review indicates that the permit application fees were not paid at the time of submittal. These fees are $2,500.00 and are required prior to further processing of the application.

The application itself requires a certification and signature by the party responsible. According to the cover letter, this should be Mr. Corbett. I am returning the original application for his signature.

In addition, the application did not mention whether there were any public or private water supply wells within the area of review. For this, the area of review will required to be a 1-mile radius.

Once these items have been submitted, the permit will be drafted and the public notice issued. Remediation activities should continue as directed by the Bureau of Corrective Actions.

Should you have any questions, please call me at (702) 687-4670, ex. 3146.

Sincerely,

Marcia Greybeck

Marcia Greybeck
UIC Program Manager
Bureau of Water Pollution Control

MG/hs
Enclosure
cc: Bob Kelso
Jim Williams

Table 1

ANALYTICAL PARAMETERS FOR THE NORTHWEST DRAINAGE DITCH

Parameter	EPA Method
Asbestos	NIOSH 740
Total Cyanide	9010
RCRA Metals	6010
Chlorate	NA
BHC (all four isomers)	8080
DDD	8080
DDE	8080
DDT	8080
PCB's	8080
Benzene	8020
Monochlorobenzene	8010
1,2 Dichlorobenzene	8010
1,4 Dichlorobenzene	8010
Carbon Tetrachloride	8010

B03
OIL Drums

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

March 17, 1995

Mr. Allen Biaggi
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Mr. Biaggi,

SUBJECT: Out of Service Diesel Fuel Storage Tank

On Marcy 2, 1995, representatives of Kerr-McGee Chemical Corporation (KMCC) met with Robert Kelso and Jeff Dennison of the NDEP to discuss issues related to KMCC's post closure permit and its relationship to the ongoing Environmental Conditions Assessment at the site. During the discussion, KMCC noted that Item 45 in the Letter of Understanding (LOU) required that we submit a work plan designed to address visible and potential hydrocarbon contamination of soil and/or ground water associated with the former diesel storage tank. This plan was to be submitted within 180 days of the effective date of the LOU.

Since the LOU was initially prepared, KMCC has removed the storage tank. It was our intent to include this investigation with the overall Phase II work plan required by the LOU; however, due to the long lead time in finalizing the Phase II agreement, the 180 day limit has expired. During the meeting, KMCC requested that we still include this item in the Phase II work plan as opposed to submitting a separate plan. Mr. Kelso asked that we submit our request in a letter for your review and approval.

If you have any questions regarding this matter, please feel free to call me at (702) 651-2234.

Very truly yours,

Susan Crowley
S. M. Crowley

SMC:j

cc: PSCorbett
PRDemps
RHJones
GBRice
JCStauter

KMCC 3/2/95

Post Closure Rqmts

Fed ~~Reg~~ 59, pg 557784 ~~[illegible]~~ Nov 8, 94

Russ Jones
Pat Dempsy
Sue Crowley
M. Hill
R. Kess, J. Dennis

Post Closure Rqmts vs [illegible] Agreements / Corr. Actions
↳ Alternatives?

Landfill Closed Prior to Jan/Feb 84

Stopped Accept 1/23/83
Not Certified by '83

2nd Doc Backdated Reg. Rqmt

KMCC operated beyond this date 7/26/82

~~[illegible]~~ Closure Document approved by NDEP

Post closure permit delayed by other investigatory activities → CA, etc completed.

Modify KMCC Consent to include RCRA Rqmts

Jan 93 - Mtg → Diesel AST → Sampling Plan - 180 days
(Coul) Comprehensive G.W. Sampling
↳ Results submitted with Work Plan
Intended for written response to Coul

Bam

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

LAW DEPARTMENT

Writer's Direct No.
(405) 270-2840

February 23, 1995

CONFIDENTIAL
VIA FASCIMILE

Mr. Allen Biaggi
Division of Environmental Protection
Nevada Department of Conservation
and Natural Resources
333 West Nye Lane
Carson City, NV 89710

Re: Henderson Industrial Site

Dear Allen:

This letter responds to your request that I outline Kerr-McGee's objectives for our scheduled meeting on March 2, 1995.

In a nutshell, Kerr-McGee seeks to confirm that it will be able to use the work that it is performing pursuant to the Phase II Consent Agreement to fulfill its post-closure permitting and other requirements under RCRA. We would like to discuss in more detail, the post-closure process so that we can be assured that we are proceeding in the right direction with respect to our closed hazardous waste landfill.

If you have any other issues that you want to discuss at the meeting, please let me know in advance so that we can be better prepared to discuss them.

(Assuming we will be without colds) I look forward to meeting with you, Jeff Denison and Bob Kelso on March 2, at 11:00. I will be accompanied by Susan Crowley and Russell Jones of Kerr-McGee and Michael Hill of Covington and Burling.

Sincerely,

Patricia R. Demps
Staff Counsel

PRD:lpd
cc: S. Crowley
M. Hill
R. Jones

B03

KERR-McGEE CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

LAW DEPARTMENT

Writer's Direct No.
(405) 270-2840

February 23, 1995

CONFIDENTIAL
VIA FASCIMILE

Mr. Allen Biaggi
Division of Environmental Protection
Nevada Department of Conservation
and Natural Resources
333 West Nye Lane
Carson City, NV 89710

Re: Henderson Industrial Site

Dear Allen:

This letter responds to your request that I outline Kerr-McGee's objectives for our scheduled meeting on March 2, 1995.

In a nutshell, Kerr-McGee seeks to confirm that it will be able to use the work that it is performing pursuant to the Phase II Consent Agreement to fulfill its post-closure permitting and other requirements under RCRA. We would like to discuss in more detail, the post-closure process so that we can be assured that we are proceeding in the right direction with respect to our closed hazardous waste landfill.

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Sincerely,

Patricia R. Demps
Staff Counsel

PRD:lpd
cc: S. Crowley
M. Hill
R. Jones

KERR-McGEE CORPORATION

LAW DEPARTMENT

FACSIMILE REQUEST COVER SHEET

NAME	NAME
Allen Biaggi	Patricia R. Demps
COMPANY NAME (IF APPLICABLE)	LOCATION (BLDG. AND ROOM NO.)
Covington & Burling	MT-1004
FACSIMILE PHONE NO. CONFIRMATION PHONE NO.	PHONE NO.
8-702-885-0868	(405) 270-2840

Total number of pages (including Facsimile Request Cover Sheet) 02

REMARKS

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Feb. 23. 1995 10:00AM KERR MCGEE LEGAL No. 3128 P. 1

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BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

PETER G. MORROS
Director

Fax (702) 885-0868
TDD 687-4678

Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

~~March 14, 1994~~ s.b. 2/17/95

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: KMCC Proposed Phase II Consultants

Dear Ms. Crowley:

The NDEP has reviewed the list of potential consultants presented in your letter of February 7, 1995, and has no concerns with the listed corporations/individuals at the current time.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021 respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso
Environmental Engineer
Bureau of Corrective Actions

RCK:jm

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005
Kent Hanson, Deputy Attorney General, NDEP
Allen Biaggi, NDEP

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

February 7, 1995

Allen Biaggi
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Proposed List of Phase II Consultants

Dear Mr. Biaggi:

Kerr-McGee is submitting for your approval a list of consultants who will potentially be involved in the Phase II activities of the Environmental Conditions Assessment. After NDEP approval of the consultant list, KMCC will be selecting a consultant to assist in Phase II activities.

Please feel free to contact me at (702) 651-2234, if you have any question or require additional information. Thank you.

Sincerely,

Susan Crowley

Susan Crowley
Specialist

I GUESS JD WILL BE ACTING CEA FOR WESTON

AB

smc\ph2con.eca
cc: PSCorbett
PRDemps
RHJones
JCStauter

KERR-McGEE CHEMICAL CORPORATION

PROPOSED CONSULTANTS FOR PHASE II

Roy F. Weston, Inc
3 Hawthorn Parkway, Suite 400
Vernon Hills, Illinois 60061-1450
Mr. Kurt Stimson

Phone: (708) 918-4000
Fax: (708) 918-4055

CEM: John David Akenheads

ENSR Consulting & Engineering
1220 Anenida Acaso
Camarillo, CA 93012
Mr. Richard A. Simon

Phone: (805) 388-3775
Fax: (805) 388-3577

CEM: Michael Astin

Dames and Moore
127 South 500 East, Suite 300
Salt Lake City, Utah 84102-1959
Mr. J.B. Brown

CEM: Mark Foster / Mark Hallee

L. H. DODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

Air Quality
Mining Regulation and Reclamation
Water Quality Planning
Water Pollution Control

STATE OF NEVADA
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Waste Management
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

February 1, 1995

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

RE: UIC Permit Application

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has reviewed the application submitted December 22, 1994, regarding injection at the Kerr-McGee facility in Henderson, Nevada. The completeness review indicates that the permit application fees were not paid at the time of submittal. These fees are $2,500.00 and are required prior to further processing of the application.

The application itself requires a certification and signature by the party responsible. According to the cover letter, this should be Mr. Corbett. I am returning the original application for his signature.

In addition, the application did not mention whether there were any public or private water supply wells within the area of review. For this, the area of review will required to be a 1-mile radius.

STATE OF NEVADA
BOB MILLER
Governor

L. H. DODGION
Administrator

Administration:
(702) 687-4670
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Air Quality
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Waste Management
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

March 14, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: Hardesty Chemical Company Site

Dear Ms. Crowley:

As a follow up to my letter of March 4, 1994, wherein the LOU language for item #4 (Hardesty Chemical Company Site) was amended to read in part, *"KMCC will provide NDEP with additional information regarding the past operation of Hardesty Chemical Company at the KMCC facility which may be reasonably available, including facility locations, products, waste streams, and waste disposal. KMCC will undertake such additional investigatory work as is determined by the Division to be necessary, including the development and implementation of appropriate work plans, based upon information identified concerning the manufacturing and waste disposal activities of Hardesty at the KMCC site"*. Please be advised that the Division will consider the National Archives records referenced in Appendix A of the BMI Common Areas Phase 1 report to be "reasonably available". KMCC should therefore be prepared to access these documents as a part of Phase II.

Enclosed for your information is a copy of an employee orientation manual entitled "Working with Hardesty", produced by Hardesty Chemical Company in 1947. Most of this publication is concerned with Hardesty's history (emphasis on the Dover, Ohio plant) and employee benefits, etc. Included is an interesting insight into Hardesty's association with AMECCO Chemicals. You will note, however that the "Henderson Plant" is referred to on page 22 and is pictured at the bottom of page 12. The latter shows what is obviously one of the main buildings (probably Unit 2) at BMI during that period.

Should you have any questions or comments, please feel free to contact me at (702) 687-4670, extension 3017.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

Enclosure

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

L.H. Dodgion, Administrator

Verne Rosse, Deputy Administrator

Kent Hanson, Deputy Attorney General, NDEP

Allen Biaggi, NDEP

L. H. LODGION
Administrator

Administration:
(702) 687-4670
Fax 687-5856

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BOB MILLER
Governor

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Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
Capitol Complex
333 W. Nye Lane
Carson City, Nevada 89710

March 14, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: KMCC Proposed Phase II Consultants

Dear Ms. Crowley:

The NDEP has reviewed the list of potential consultants presented in your letter of February 7, 1995, and has no concerns with the listed corporations/individuals at the current time.

Please do not hesitate to contact me or Allen Biaggi at (702) 687-4670, extension 3020 and 3021 respectively, if you have any questions or comments regarding this matter.

Sincerely,

Robert C. Kelso
Environmental Engineer
Bureau of Corrective Actions

RCK:jm

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005
Kent Hanson, Deputy Attorney General, NDEP
Allen Biaggi, NDEP

KERR-McGEE CORPORATION
AND SUBSIDIARY COMPANIES

FACSIMILE REQUEST KM-5434-3

INSTRUCTIONS: Originator forward set intact to Operator. The yellow copy will be returned as confirmation.

TO: ADDRESSEE	FROM: ORIGINATOR
NAME G. Christiansen - MT-2601 R. H. Jones - MT-1501 G. B. Rice - MT-2003 J. C. Stauter - FAX 3787 P. R. Demps - FAX 4101 P. S. Corbett - Henderson	NAME Susan M. Crowley LOCATION (BUILDING AND ROOM NO.) Henderson, Nevada PHONE NO. KMNet 531-2234

Total number of pages (including Facsimile Request) 2

REMARKS

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*** BROADCAST REPORT ***

PRINT TIME 03/06 '95 15:57 ID:KERR-McGEE-HEN 702-651-2310 PAGE 1

No.	START TIME	MODE	LOCATION	STORE PAGE	TX PAGE	TOTAL TIME	CODE
1	03/06 15:54	TX	K-M GEN	2	2	00'53"	OK
2	03/06 15:55	TX	K-M-LAW DEPT	2	2	00'55"	OK
3	03/06 15:56	TX	JC STAUTER	2	2	00'53"	OK

STATE OF NEVADA
BOB MILLER
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L. H. DODGION
Administrator

Administration:
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PETER G. MORROS
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Waste Management
Corrective Actions
Federal Facilities

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

March 4, 1994

Susan Crowley
Kerr-McGee Chemical Corporation
P.O. Box 55
Henderson, Nevada 89009-7000

Subject: Proposed Alternative Language, Letter of Understanding Between NDEP and Kerr-McGee Chemical Corporation (KMCC)

Dear Ms. Crowley:

In furtherance of the perpetually evolving LOU editorial process, I offer for your consideration the following modifications and/or alternative language. The change to item #4 is designed to make it consistent with similar items in the Common Areas and Stauffer/Pioneer LOUs. Conversely, all reference to the Common Areas LOU has been removed from items #59 and #60. This is a reflection of the HISSC's decision (reference item #5 of HISSC's 2/4/94 letter to NDEP) to assign assessment, etc. of the storm, acid, and caustic drain systems to the respective facilities which contain these systems.

4) Hardesty Chemical Company Site:

Provide analytical data obtained from sampling of the ground water monitoring wells installed on the J.B. Kelley lease site. As these wells were installed for the evaluation of potential hydrocarbon contamination from the underground storage tanks formerly located at the J.B. Kelley site, NDEP may request additional sampling of these wells with an expanded list of analytes.

KMCC will provide NDEP with additional information regarding the past operation of Hardesty Chemical Company at the KMCC facility which may be reasonably available, including facility locations, products, waste streams, and

waste disposal. KMCC will undertake such additional investigatory work as is determined by the Division to be necessary, including the development and implementation of appropriate work plans, based upon information identified concerning the manufacturing and waste disposal activities of Hardesty at the KMCC site.

59) Storm Sewer System:

Provide documentation of system flow/integrity investigations as part of a technical evaluation concerning the potential for soil and/or ground water contamination resulting from waste disposal and storm water discharges through the storm sewer system.

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from the storm sewer system. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

60) Acid Drain System:

Provide a technically based evaluation of the potential for soil and/or ground water contamination resulting from historic waste disposal through the acid drain system.

Provide a technical evaluation of the appropriateness of the placement and design criteria for wells used to monitor potential contaminant migration from the acid system. Include a list of the analytes which are currently monitored for and the latest data. Reference to the facility wide hydrologic evaluation conducted in July of 1993 may be used to provide some or all of the requested information.

With the above modifications, and your concurrence, I hope that we can finalize the LOU and progress apace with further Phase II negotiations. We hope to be able to distribute a draft Phase II consent agreement for review and comment by the middle of May.

Please feel free to contact me at (702) 687-4670, extension 3017, should you have any questions.

Sincerely,

Edward L. Basham
Environmental Management Specialist
Remediation Branch
Bureau of Corrective Actions

ELB:kmf

cc: Barry Conaty, Esq., Cutler & Stanfield, 700 Fourteenth Street, N.W., Washington, D.C. 20005

L.H. Dodgion, Administrator

Verne Rosse, Deputy Administrator

Kent Hanson, Deputy Attorney General, NDEP

Allen Biaggi, NDEP

SMC

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

February 7, 1995

Allen Biaggi
Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Subject: KMCC Proposed List of Phase II Consultants

Dear Mr. Biaggi:

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Please feel free to contact me at (702) 651-2234, if you have any question or require additional information. Thank you.

Sincerely,

Susan Crowley

Susan Crowley
Staff Environmental Specialist

smc\ph2con.eca
cc: PSCorbett
PRDemps
RHJones
JCStauter

KERR-McGEE CHEMICAL CORPORATION

PROPOSED CONSULTANTS FOR PHASE II

Roy F. Weston, Inc
3 Hawthorn Parkway, Suite 400
Vernon Hills, Illinois 60061-1450
Mr. Kurt Stimson

Phone: (708) 918-4000
Fax: (708) 918-4055

CEM: John David Akenheads

ENSR Consulting & Engineering
1220 Anenida Acaso
Camarillo, CA 93012
Mr. Richard A. Simon

Phone: (805) 388-3775
Fax: (805) 388-3577

CEM: Michael Astin

Dames and Moore
127 South 500 East, Suite 300
Salt Lake City, Utah 84102-1959
Mr. J.B. Brown

CEM: Mark Foster / Mark Hallee