CES Certified Environmental Services, Inc.

1401 Erie Blvd. East
Syracuse, NY 13210
Phone 315-478-2374
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June 7, 1996

NYSDEC Region #6
ATTN: Mr. Gary McCullouch, P.E.
317 Washington Street
Watertown, New York 13601

Re: Alaskan Oil, Inc. 23179 Route 342 & I81, Watertown, New York Bioremediation Project

Dear Mr. McCullouch:

Although the reason for our meeting yesterday is a little unfortunate, our conversation was beneficial in that some important details of the bioremediation program were discussed. In an effort to continue to conduct a more efficient and beneficial bioremediation program, Certified Environmental Services (CES) is continually incorporating new ideas into the existing and proposed bioremediation projects it has and will undertake. Our goal is to provide successful remediation of petroleum-contaminated soil which coincidentally produces a substantial cost savings over landfill disposal for our client. Please note that the most recent soil lift which has been removed from both the Bradley Street (1,000 yd^3) and Route 342 (1,200 yd^3) biocells has been estimated to cost less than $8/ton to bioremediate. With the cost to landfill, at the time these soils were initially excavated, estimated at $55/ton, the last lift at these two sites, saved Alaskan Oil $155,100.00. Even at todays landfill prices at $32/ton, the cost savings realized would have been $79,200.00. Obviously, with cost savings such as these, it is in Alaskan Oil's best interest to continue to pursue bioremediation and ways of making it more efficient.

Several details regarding the Route 342 biocell were brought up which prompted me to review our file on this site. The approved bioplan specifies that thirty inches (30") of contaminated material could be loaded into the cell, see *ATTACHMENT A*. This week Alaskan Oil stripped twelve inches (12") of treated soil from the cell. As I pointed out during our conversation, Alaskan Oil excavated several test pits upon completion of stripping activities. The test pits indicate that the west end of the cell has twelve inches (12") of contaminated soil remaining and the east end of the cell has approximately twenty-four inches (24") of contaminated soil remaining. Therefore, the west end of the cell was initially loaded to twenty-four inches (24") and the east end of the cell was loaded with thirty-six inches (36") of contaminated material. These levels yield an average of thirty inches (30") of contaminated material. Also, in the letter attached as *ATTACHMENT B*, the two stage approach is discussed and was verbally approved by the Department. With no apparent opposition from the Department, we promptly and diligently proceeded with this approach.

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As requested in a letter from Mr. Voss dated May 3, 1996, a log will continue to be kept with the dates of the monthly inspections, inoculation and tilling events. A copy of the log documenting the past year of activity at this project along with results from laboratory analyses will be forwarded to Mr. Voss in the near future.

Again, I found our conversation beneficial and feel that the attached information will be a useful recollection of the project. Do not hesitate to contact me at (315)478-2374 if you have any concerns or comments regarding the information provided herein.

Sincerely,
Certified Environmental Services

Eric E. Murdock
Project Manager

ATTACHMENT A Bioplan: Soil Depth Specification
ATTACHMENT B CES Letter 6/19/95: Two Lift Staged Approach

cc: R. Brazell, NYSDEC
R. Neugebauer, AOI
T. Voss, NYSDEC

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ATTACHMENT A

Bioplan: Soil Depth Specification

4.0 SITE ACTIVITIES (Continued)

Remedial design includes:

(1) Site selection for cell construction

(2) Site grading to produce at least a 2% slope, if a natural slope does not exist

(3) Excavating a sump pit at the low end of the cell footprint to facilitate the appropriate collection of leachate to allow for appropriate disposal if necessary

(4) Construction of berms approximately 2' in height, with sand or haybales, on the outside edges of the cell to prevent migration of soil and water from the cell outside or on to the treatment cell

(5) Removing sticks, rocks, etc. that may puncture liner by screening

(6) Lining cell and berms with a 60 ml HDPE liner to mitigate soil and leachate from impacting native soil and groundwater. The liner will be anchored on the outside periphery of the cell with soil and or hay bails

(7) Spreading clean sand on to liner in a 6" layer to protect from tears when tilling

(8) Covering the sand buffer layer with hay or straw

(9) Spreading hydrocarbon-laden soil over sand at a depth of approximately 30"

(10) Augmenting soil with Munox, a microbial inoculum provided by BioSolutions

(11) Amending soil with Munoxate a Nutrient Supplement provided by BioSolutions

(12) Tilling the soil to distribute microorganisms and nutrients, and to increase aeration

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ATTACHMENT B

CES Letter Dated 6/19/95: Two Lift Staged Approach

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FILE COPY

June 19, 1995

Mr. Thomas Voss
Engineering Technician III
NYSDEC Region #6
317 Washington Street
Watertown, NY 13601

RE: Parish Energy, Inc. Route 342
Bioremediation Project
Watertown, NY
Spill #94-08981

Dear Mr. Voss:

On behalf of Parish Energy, Inc. (PEI), Certified Environmental Services, Inc. (CES), is pleased to submit this progress report detailing work performed and future remedial activities we plan to incorporate upon your department's review and approval.

On Tuesday, April 18, 1995, personnel representing PEI, Dave Rose Construction, and CES removed the polyethylene cover from the above referenced biocell. The soils contained within the biocell were water saturated to the extent that water appeared at the surface. The top of the biocell was trenched toward the area where the sump is to be installed to divert/remove standing water and left uncovered to expedite drying.

CES returned to the site on April 20, 1995, along with a representative from Bio-Solutions, Inc. to apply microbial nutrients to the biocell. Two days of sunshine and a light breeze helped reduce the surface moisture of the cell. However, the soils below the top three to four inches remained saturated. Walldorff Farm Equipment personnel's attempt at tilling to mix in the applied nutrients and aerate the soils of the cell was unsuccessful due to the high moisture content of the predominately clay/silt soil. Consequently, the biocell was left uncovered for two additional days to allow further evaporation.

On Monday, April 24, 1995, Dave Rose construction used a wide track dozer to grade the soil within the biocell to uniform thickness and create a slope for water run-off. The Northwest

corner of the biocell, which was designed to be the sump collection point, revealed the highest level of saturation. This indicates that the cell construction is functioning properly. However, the fine-grained low conductivity soils has slowed the movement of the cell's internal water to this area.

As a result of the high moisture content the biocell was left uncovered for an additional seven days to promote further evaporation. This additional exposure to the atmosphere appeared to be successful. On Monday, May 1, 1995 the cell was re-covered with polyethylene.

Overall, the difficulty with managing this particular biocell has been due to the large volume of fine grained saturated soil averaging three feet in thickness, which decreases the rate at which the water drains and evaporates. Obviously, it is understood that to increase the efficiency of de-watering the lower half (bottom 1.5 feet) of this cell an elaborate system of perforated piping and trenching would be required. However, the success of such an expensive and time consuming operation would remain limited since the transport of water to such conduits is contingent upon the low conductivity of the soil. Therefore we simply recommend longer exposure to the air (pile uncovered) and utilization of the sump to achieve dewatering.

As you may recall, the original sump was designed to permit water to percolate through the staged soils to a one foot layer of sand sandwiched between the top of the cell liner and the bottom of the contaminated soils. The sand layer, in conjunction with the slope of the liner, should allow cell water to drain to a low point in the cell where the sump is to be installed. Water within the sump will be pumped to a holding tank on the site and used to increase the moisture content of the soils if it becomes to low for bio-activity.

As a result of the large cell size, moisture problems and soil depth, we proposed to handle this project in phases. During the summer/fall months of 1995 we will incorporate our efforts on the top half (approx. 1.5 feet) of the cell. This will provide us greater control over the moisture level, bug count, sampling parameters, etc. With the depth of tilling reduced by half,

smaller/lighter equipment will be utilized which allow monthly or semi-monthly aerating of the soil regardless of moisture conditions. In addition, smaller/lighter equipment should reduce the possibility of getting the tilling equipment stuck and/or damaging the body of the biocell.

As long as this upper layer of soil is able to "breath" and the microbes can transport through the media, the biocell will function successfully as outlined in the original plan, even though it will remain uncovered for longer periods of time. Once the upper half (approx. 1.5 feet) of the bio-soil has been analytically tested and the results approved by the NYSDEC, that portion of the biocell soils will be removed. This will allow us to initiate the second phase, treatment of the lower half (approx. 1.5 feet), during the summer of 1996.

In conjunction with the sump installation additional site drainage enhancements will take place in the area surrounding the cell itself. These improvements will improve drainage throughout the area surrounding the cell to maintain an overall lower moisture content.

Once indicator analyses of soil samples collected from the upper half (approx. 1.5 feet) reveal compliance with threshold values established by NYSDEC "STARS" memorandum, composite samples of the upper soils will be collected for analyses. The analytical results will be forwarded to NYSDEC with a request to remove the upper soils from the cell for placement in a lined, temporary staging area where they will undergo additional sampling and analyses in accordance with the requirements listed under "STARS". If after this sampling program, "STARS" soils criteria is met, a formal request for soils disposition on the biocell site will be made. Similar procedures will be applied to the soils within the lower half (approx. 1.5 feet) of the cell during the 1996 season. Upon completion of each remedial phase, we will issue a final report to the NYSDEC drawing this entire program to a close.

Based on recent conversations with your department I believe this approach will meet with your approval. Obviously, we are anxious to incorporate this plan as soon as possible due to the limited favorable weather conditions allowed us in this region.

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Should you have any questions or if additional information is required, please do not hesitate to call me or Bob Foresti at (315)478-2374.

Sincerely;
Certified Environmental Services, Inc.

Patrick A. Leone, Jr.
Project Supervisor

cc: D. Chapman, PEI
R. Foresti, CES
G. McCollough, NYSDEC Region #6