USW 12-369

From: Olsen, Jan R [Jan_R_Olsen@rl.gov]
Sent: Tuesday, March 25, 2014 11:07 AM
To: gprescott@usw.org
Cc: USW 12-369 (pace80369@frontier.com)
Subject: WSCF Closure
Attachments: 1000648A_10-ISI-0096_CONTRACT_DELIVERABLE_CD0078_SIU-001 _ANALYTICAL_SERVICES_MASTER_PLAN.pdf; AEI Comparability Study for WSCF.pdf; FINANCIAL IMPACTS WSCF SHUTDOWN.docx; WCH Item 32 - WSCF Inorganic Instrument Inventory - 2012.pdf; WCH Item 32 - WSCF Organic Instrument Inventory - 2012.pdf; WCH Item 32 - WSCF Radiochemistry Instrument Inventory - 2012.pdf

Gaylan,

Here is some information on WSCF Closure Costs. The cost per year not to use WSCF is much higher than DOE would have you know. The contractors at Hanford that we support have a multitude of concerns meeting their goals without WSCF. Costs aside Worker safety is also a concern. We support IH samples that protect worker health.

Hope all this helps
Jan Olsen

Additional cost for sending samples offsite taken from A-10-ISI-MSA-WSC-009, Assessment Report of the Analytical Services Master Plan document, The number below of 2.8M year is only ¼ of the sample volume that would go offsite if WSCF closes. So if you conservatively multiply 2.8 M x4 =$ 11.2 million just for the extra costs for rad analysis to be able to send offsite. Most generators do not have capacity to hold all of the samples at proper temperature awaiting shipment currently, they will have to add that capacity, additional costs. 222S (high level laboratory) and the CHPRC rad counting lab by weather station are currently the only remaining places that a rad count will be able to be analyzed. Awaiting radiological analytical results will delay shipment by one day,

there is enough historical data that allows the project to send the samples to an offsite laboratory without performing a radiation count prior to shipment. Thus the only costs associated with these samples would be the cost to transport them to the offsite laboratory.
However, other samples will require radiation counting if the samples are to be shipped offsite (as required **by** the radiation shipment record - RSR) at either the WSCF (or another facility that could be set up if WSCF was closed down) or **222-S** laboratory. During the sampling, the radiation protection technicians (RPTs) determine the level of counting required and review the project's Sampling and Analysis Plan **(SAP).** Based on the guidance, the samples are counted (screened) at WSCF for alpha/beta contamination for a cost of -$100/sample and gamma counting **$170** or at **222-S** for alpha/beta and gamma (GEA-gamma emission analysis) for a total cost of $400/sample. To facilitate this requirement, the samplers take an extra sample to take to the laboratory and then store the remainder of the sample in a controlled environment (i.e. **40 C)** until the data are obtained to complete the RSR to ship offsite. The results are usually available the next day and the samples are then ready to be transported through **1162** building. At **1162** they are logged and transported to local area laboratories or shipped via FedEx to non-local laboratories.

The total counting cost with radiation shipment would be approximately $2.8M/year (at average of 29,400 samples per year). Currently all samples coming to WSCF get an abbreviated count. This count is not as extensive as the count required for shipping.

Sample Source	Count Type	Number of Samples	Percent Count	Cost per Sample	Total Cost

Groundwater	Alpha/Beta	6554	31	100	$655,464
	Gamma/Alpha Beta	634	3	270	$171,266
Tank Ops	Gamma/Alpha Beta	3298	100	335	1,104830
Other	Alpha/Beta	2479	50	100	247900
	Gamma/Alpha Beta	2479	50	270	669,330
Total		29400			2848790

Also taken from the same document – again would be multiplied by 4, they did not take into account the HAZMAT fee and return cost fees.

Shipping Cost Notes:
Average samples per day = 120
Trucks ship 4 to 5 ice chests per trip; ice chests hold 3 to 10 samples each Ice chests per day range from 12 to 40
Trips per day = 3 to 9; equates to avg 2 trucks running full time per day 2 FTEs = $250K/year
Truck rental = $10K total 2 trucks per year
Fuel = $20/trip = $120/day (avg 6 trips per day) Total fuel = $120 x 250 days = $30,000
Total cost = $290K per year or approximately $10 per sample
Total

Also from the same document, but does not take into consideration the waste disposal costs.

D&D costs for the total WSCF could range from $40 to **$75/SF** depending upon the agreed debris disposition. This is a ROM estimate range of **$3** million to **$6** million.

Jan Olsen
MSA Hanford
509-373-2909

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
A. E. Hopko/RL	F. A. Figueroa/MSA	1000648 A DOE-RL: 10-ISI-0096 CC Recd: 05/17/2010

ACTION: Respond with requirements for MSA to operate WSCF as "Best-in-Class" laboratory by July 16, 2010.

Subject: **CONTRACT NO. DE-AC06-09RL14728 – CONTRACT DELIVERABLE CD0078 (SIU-001) ANALYTICAL SERVICES MASTER PLAN**

"If there is an action, an E-STARS task will be assigned and forthcoming"

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A-6001-538S (02/98)

Department of Energy
Richland Operations Office
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Richland, Washington 99352

1000648 A
MSA Recd: 05/17/2010

10-ISI-0096

MAY 12 2010

Mr. F. A. Figueroa, President
and General Manager
Mission Support Alliance, LLC
Richland, Washington 99352

Dear Mr. Figueroa:

CONTRACT NO. DE-AC06-09RL14728 - CONTRACT DELIVERABLE CD0078 (SIU-001) ANALYTICAL SERVICES MASTER PLAN

The purpose of this letter is to transmit Richland Operations Office's (RL) response to Contract Deliverable Analytical Services Master Plan to Mission Support Alliance, LLC (MSA).

RL completed an assessment (Assessment Report of the Analytical Services Master Plan dated April 9, 2010) of the Analytical Services Master Plan delivered by MSA on February 16, 2010. A copy of this assessment is attached along with the EMCBC Cost Estimate and Analysis Report for the Waste Sampling and Characterization Facility (WSCF) Commercialization. RL has determined that commercialization of WSCF as described in MSA's Analytical Services Master Plan is not a viable option. Therefore, any actions identified in the attachment no longer requires action.

However, please respond within 60 days of receipt of this letter with an answer as to what is required for MSA to operate WSCF as a "Best-in-Class" laboratory. The response should include the necessary actions, the schedule, and a rough order of magnitude (ROM) costs, plus a description of reasonable methods of measurement that would be used to determine how well WSCF is doing to achieve "Best-in-Class" over time.

In addition, please provide the following:

- Track facility monthly availability and up time. Coordinate with the RL program contact on how this information will be provided on a routine basis.
- Establish/implement a methodology for tracking and reporting on time analysis of quick turn-a-round samples.
- Establish/implement a methodology for tracking and reporting on time analysis of normal turn-a-round samples.
- A report on the laboratory accreditations, the status of each, and any changes to accreditations within 30 days of the change.
- Negotiate with HAMTC on the turn down clause in an effort to resolve current associated client issues.

If you have any questions, please contact me, or your staff may contact Karen L. Flynn, Division Director, Site Infrastructure Services and Information Management Division, on (509) 376-7323.

Sincerely,

Alan E. Hopko
Contracting Officer

ISI:RAW

Attachments

cc w/attachs:
J. M. Armstead, MSA
D. A. Crawford, MSA
D. M. Landry, MSA
E. C. Lugo, MSA

U.S. Department of Energy
Richland Operations Office

ASSESSMENT REPORT
of the Analytical Services Master Plan

A-10-ISI-MSA-WSC-009
March 24, 2010

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1
2.0 ASSESSMENT SCOPE 1
3.0 PERSONNEL CONTACTED DURING THE ASSESSMENT 3
4.0 DETAILED DESCRIPTION OF ASSESSMENT ACTIVITIES 3
4.1 PROPOSED COST SAVINGS 3
4.2 READY-TO-SERVE (RTS) COSTS 3
4.3 TRANSITION COSTS 4
4.4 CUSTOMER INPUT 4
4.5 INTERFACE ISSUES 5
4.6 MAINTENANCE ISSUES 6
4.7 UNION ISSUES 7
4.8 ISSUES WITH EQUIPMENT TRANSFER 9
4.9 LIM'S LICENSE TRANSFER 9
4.10 RADIOACTIVE MATERIAL LICENSE 10
4.11 SHIPPING REQUIRED FOR SAMPLES 10
4.12 ADVANTAGES/DISADVANTAGES OF PLANS 11
4.13 RISKS 14
5.0 MANAGEMENT CONSIDERATIONS 14
6.0 REFERENCES 15
7.0 CONCLUSION 15

ACRONYMS

AIHA	American Industrial Hygiene Association
ASMP	Analytical Services Master Plan
CBA	collective bargaining agreement
CBC	Columbia Basin College
CHPRC	CH2M HILL Plateau Remediation Contract
CIR	contractor industrial relations
CLS	Center for Laboratory Sciences
DOE	U.S. Department of Energy
DOE-CBC	Consolidated Business Center, Office of Cost Estimating and Analysis
DOH	Washington State Department of Health
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
ETF	Effluent Treatment Facility
G&A	general and administrative
GSA	General Services Administration
HAMTC	Hanford Atomic Metal Trade Council
HVAC	heating, ventilation, and air conditioning
LIM	laboratory information management
MSA	Mission Support Alliance
NRC	U.S. Nuclear Regulatory Commission
ORP	Office of River Protection
RL	Richland Operations Office
ROM	rough order of magnitude
RPP	River Protection Project
RPT	radiation protection technician
RSR	radiation shipment record
RTS	ready-to-serve
SAP	Sampling and Analysis Plan
SOW	statement of work
TPA	Tri-Party Agreement
WC	workers' compensation
WSCF	Waste Sampling and Characterization Facility
WTP	Waste Treatment Plant

1.0 EXECUTIVE SUMMARY

The assessment team evaluated the Analytical Services Master Plan (ASMP) that was submitted to DOE on February 16, 2010. This ASMP proposes four alternatives for the Waste Sampling and Characterization Facility (WSCF):

- **Plan A** is for the commercialization of WSCF by transferring all of the work to the Center for Laboratory Sciences (CLS) located at Columbia Basin College (CBC) in Pasco, Washington.
- **Plan B** is to continue to run WSCF as it has been run in the past.
- **Plan C** is to continue to run samples through WSCF, but to commercialize operations wherever practicable.
- **Plan D** is to outsource all WSCF work to qualified offsite laboratories.

Plan A (commercialization of WSCF at CBC) has the advantage of operating in a new facility with potentially lower operational costs, however the verifying data is lacking in the ASMP. There are issues that require resolution if this plan is considered. The main issue concerns the union and the questions that must be satisfactorily answered there. Another serious issue is verification that Mission Support Alliance (MSA) can sign a lease for the lab at CBC.

Before the assessment team would be able to recommend that Plan A be pursued, MSA would have to satisfactorily address the following issues:

- Answer all questions from the Hanford Atomic Metal Trade Council (HAMTC) sections with definitive answers.
- Verify the estimated shipping cost (including counting) for all samples under Plan A.
- Estimate the operational cost savings under Plan A. The estimate should include cost details including the basis of estimate.
- Verify MSA is willing to sign for the CBC lease (report the lease terms to DOE).
- Verify with details the $60.5M cost savings
- Specify and calculate cost for disposing of residual samples and laboratory waste.
- Verify the position of Washington State Department of Ecology and U.S. Environmental Protection Agency (EPA) on the potential shutdown of WSCF and transfer of operations to CLS.

Plan B maintains current operational status. In the short run this is a low risk plan due to not having a transition. However, in its current configuration, WSCF will be unable to meet the demands of all customers satisfactorily unless modifications and corrective maintenance needs are addressed. If this option is chosen, the facility would need approximately $930K worth of urgent repairs (not including costs for laboratory downtime). If Plan A's sample shipping and lease costs exceed any operational savings, then the one-time costs of WSCF upgrades would be more cost effective than proceeding with Plan A.

The team did not feel that Plan C was any different than Plan B, but just results in moving money around with little additional actions. However, the contract could be changed to incentivize the contractor to make changes that would result in better productivity and reduced costs.

Plan D is not considered viable due to required short turnaround and/or hold times for some tests. Plan D would also mean the loss of most, if not all, of the current WSCF jobs in the Tri-Cities. The ASMP did not provide further analysis of Plan D, nor is it recommended that Plan D be considered.

2.0 ASSESSMENT SCOPE

Per contract requirements, MSA DE-AC06-09RL14728, an Analytical Services Master Plan was submitted to DOE-Richland Operations Office (RL) on February 19, 2010. DOE must evaluate and respond within 60 days. To meet this requirement an assessment team was assembled representing both RL and the Office of River Protection (ORP).

The ASMP evaluated four plans:

- Plan A: Move WSFC operations to the CLS at CBC.
- Plan B: Continue WSCF current operations without changes.
- Plan C: Continue WSCF operations using commercial practices.
- Plan D: Outsource all WSCF work to qualified offsite laboratories.

The ASMP concluded Plans A and B were viable.

The Assistant Manager for Mission Support developed a scoping statement for evaluating the ASMP, which reads:

> Determine, within 45 days of staffing, the viability, advisability, and rough order of magnitude (ROM) cost for allowing the Waste Sampling and Characterization Facility (WSCF) to transfer/commercialize operations. Consider commercialization both at WSCF in WSCF and RJ Lee at the Center for Laboratory Sciences (CLS) in Columbia Basin College (CBC). This should include:
>
> - Validation of costs and cost savings in the Analytical Services Master Plan (ASMP).
> - Develop a ROM estimate for transition costs for moving operations to the CLS.
> - Determine if HAMTC issues may exist.
> - Determine the costs of HAMTC employees in the ready to serve WSCF budget.
> - Review all interface issues to determine if any critical issues exist.
> - Determine a list of potential problems of moving to the CLS.
> - Determine guarantees of future work RJ Lee is requesting if work is moved to the CLS.
> - Determine the viability of zeroing out the ready to serve costs at WSCF.
> - Determine potential issues and costs with going to Plan C (commercialization of WSCF at WSCF).
> - Determine risks associated with evaluated plans. Split risks into the following groups:
>   - Political
>   - Scope/schedule
>   - Technical
>   - Environment, safety, and health
>   - Other
> - Determine acceptability of transferring approximately $5M of WSCF equipment to CLS.
> - Determine the cost and required laboratory information management (LIM) licenses for moving to CLS.
> - WSCF has a sub-grade counting room that has very low background to enable very sensitive detection. Determine if the CLS facility can produce the same results as required for these samples.
> - Determine the cost impact for shipping samples offsite. For chromium and other analysis determine the impact for not meeting "hold times."
> - Will CLS's radioactive material license be acceptable for handling all samples? If not what is the cost and availability to relicense?
> - Evaluate Plan A (move WSCF to the CLS), Plan B (continue operations as usual at WSCF), Plan C (commercialize WSCF at WSCF), and any potential other plans that would be more cost effective.
> - Consider interviews of laboratory customers and any issues they may have with the potential commercialization.

In addition to the above evaluation scope, during the process of the assessment several additional points of evaluation were added to the scoping statement. These include:

- Maintenance issues.
- Washington Department of Ecology laboratory accreditation.
- Expanded assessment to include Plan C, which would continue WSCF operations using commercial practices.
- Developing a list of advantages and disadvantages for each of the three plans.

Based on the above scoping plan, an assessment report and a PowerPoint presentation will be prepared. Both will include the recommended course of action for RL.

3.0 PERSONNEL CONTACTED DURING THE ASSESSMENT

- Naomi Bland, DOE-RL
- Terry Brennan, DOE-Consolidated Business Center, Office of Cost Estimating and Analysis (DOE-CBC)
- Ruth Bushaw, ATL
- Dennis Clausen, DOE-RL
- Dave Crawford, MSA
- Richard Cummins, CBC
- Troy Dale, MSA
- Bruce Darling, MSA
- Paul Davis, DOE-RL
- Steve Einan, DOE-RL
- Karen Flynn, DOE-RL
- Joyce Gilbert, DOE-RL
- Anine Grumbles, Washington State Department of Health (DOH)
- Don Hanny, MSA
- Jim Hanson, DOE-RL
- Don Hart, RJ Lee
- Doug Hildebrand, DOE-RL
- Robert Lober, DOE-ORP
- Larry Lockrem, MSA
- Stewart Lombard, Ecology
- Billie Mauss, DOE-ORP
- Huie Meznarich, MSA
- Mike Mills, DOE-CBC
- John Morse, DOE-RL
- Sen Moy, DOE-RL
- Patrick O'Brien, MSA
- Cindy Oliver, DOE-RL
- Steve Olszewski, DOE-CBC
- Jan Pennock, CHPRC
- John Prilucik, WRPS
- Frank Roddy, DOE-RL
- Bill Sacareno, CBC
- Joe Sears, RJ Lee
- Connie Smith, DOE-RL
- Chris Sutton, CHPRC
- John Trechter, MSA
- Sam Vega, DOE-ORP
- Cliff Watkins, Navarro
- Rich Westberg, MSA
- Jerry Yokel, Ecology

4.0 DETAILED DESCRIPTION OF ASSESSMENT ACTIVITIES

4.1 PROPOSED COST SAVINGS

Page 2 of the ASMP states that Plan A would result in an estimated cost avoidance of $60.5M. DOE-CBC's "Cost Estimate and Analysis Report" dated March 22, 2010 (Reference 1) stated, "...the cost savings potential, as stated at $60 million over ten years could not be validated."

4.2 READY-TO-SERVE (RTS) COSTS

Reference 1 states that, "If the RTS budget were eliminated ("zeroed out"), WSCF would have to be able to account for the costs included in the RTS budget with the funding from the usage-base budget. In order for the laboratory to accomplish this, the sample analysis costs would likely need to double since the

WSCF budget would be cut in half. This may prove problematic if other projects throughout the Hanford Site are unable to afford the higher sample analysis costs and begin shipping their samples to offsite laboratories for analysis. If WSCF is to remain operational at its current staffing level then the RTS budget needs to remain intact throughout the operation of the laboratory" (reference 1).

4.3 TRANSITION COSTS

Reference 1 documented a total of $9,464,435 in transition costs. This would cover:

- Construction of a gas bottle room
- Construction of a 90-day storage pad
- Construction of a sample archive storage area
- Set up an administrative area (20,000 sq. ft.)
- Refurbish existing office space to lab space (5,000 sq. ft.)
- New lab construction (20,000 sq. ft.)
- Expand the lab into the future area (10,000 sq. ft.)
- Outfit with lab furniture and hoods

Of these costs, $9,334,435 would be borne by a CBC bond. DOE would pay an immediate expense of $130,000. The assessment team had a significant discussion with Richard Cummins (president of CBC), Bill Sacareno (senior vice president of administration at CBC), and Larry Lockrem (WSCF associate manager). CBC administration iterated that they could easily float a bond to perform all of the needed construction with the repayment to take place through lease payments over seven to twenty years. The length of the lease term would be determined by negotiations between CBC and MSA. Since DOE is generally not willing to sign a lease, MSA would have to sign up for the lease presumably for their contract term. The cost to build CLS at CBC was $1.9M (33,000 sq. ft. and $57 per square foot) and a vocational building currently under construction is projected to cost $22M (80,000 sq. ft. and $275 per square foot). CBC reports that their experience with construction would indicate that the new lab could be built for under $4M (or $200 per square foot). CLS would approximately be doubling in size. CBC was adamant that their construction cost was far lower than DOE's and even other commercial costs. This cost would be repaid by DOE through lease back.

4.4 CUSTOMER INPUT

Groundwater Remediation (John Morse, Jim Hanson, Doug Hildebrand, and Naomi Bland)

The groundwater program's primary concern is the ability of the proposed future analytical lab services to meet the increasing sample demands, particularly during the next few years during which transition from WSCF to CLS would occur. The groundwater program has six Tri-Party Agreement (TPA) milestones due prior to 2013 (additional TPA milestone under negotiation) that will require efficient analytical capability support. Although there remain questions regarding accuracy of the sample test projections, current estimates indicate a near-doubling of test volume from 2009 to 2010, and the projected volume through 2019 remains high (for combined groundwater and soils samples) as compared to pre-2010 levels. Groundwater sample analyses are expected to decrease after 2013. Even at six months into FY2010, problems with turnaround times are surfacing that need to be resolved. This is exacerbated by the fact that all samples sent offsite must be first approved by HAMTC via "first right of refusal." The groundwater program feels that additional onsite and offsite lab capacity is required.

The groundwater program also expressed the opinion that the issue of hold times and turnaround times specifically for chrome-VI samples is a resolvable issue, and would not necessarily be a driver for a decision to shift analytical capability from WSCF to an offsite lab. There have been issues with turnaround times for the WSCF lab, however the RL groundwater program acknowledged that part of the

problem during 2010 has been with the CH2M HILL Plateau Remediation Contract (CHPRC) groundwater program.

Some data has been flagged by the project for further evaluation of analytical quality due to variability when compared to historical data.

Soils Remediation (Frank Roddy)

The soils remediation project lead expressed dissatisfaction with the turnaround times of samples at WSCF and the way the HAMTC "work turndown clause" is applied. The project has experienced delays in analyses due to equipment breakdown that causes the samples to be transferred to 222-S and then on to offsite laboratories if 222-S turns down the work. Each laboratory transfer adds delays that are unacceptable to the project. The project would like to be able to send samples to offsite laboratories as soon as WSCF experiences equipment issues, or to send the samples directly to offsite laboratories. WSCF analytical quality meets project expectations.

ORP– River Protection Project (RPP) (Billie Mauss, Robert Lober, and Sam Vega)

Currently ORP uses WSCF to support several areas under their scope. These primarily include:

- Industrial hygiene: tank vapors and asbestos
- Process operations: Effluent Treatment Facility (ETF) samples to support operations of 242-A Evaporator
- Remediation: tank closure soil samples from the tank farms

There have been very few issues identified by the RPP with WSCF support of industrial hygiene and process operations. Recent samples supporting tank closure have had issues. The analyses of these samples were turned down by both WSCF and 222-S and contracted offsite to CLS. The project sent 41 soil samples to CLS for very specific analyses following their contract award. CLS failed to analyze for key constituents and did not meet some of the hold times stated in the statement of work (SOW). Communication issues occurred between the customer and CLS throughout the process. This has resulted in a large schedule and cost impact to the project.

In the future ORP will need support for the areas listed above as well as effluent samples to support Waste Treatment Plant (WTP) operations. This will include significant analyses for liquid effluents being treated at ETF and also gaseous samples. There is a concern that moving this capability offsite and closing down WSCF might have impacts in supporting an operating facility. The main concerns are adequate turnaround times and sample analyses prioritization at an offsite laboratory. Failure to deliver analytical results on schedule could result in WTP shutdown, at an estimated cost of $1-2 M/day.

4.5 INTERFACE ISSUES

HAMTC Interfaces (placement of HAMTC personnel and interns working with HAMTC personnel)

There is a potential major issue with HAMTC workers working offsite including the possible re-negotiation of a collective bargaining agreement (CBA).

Counting and Shipping (tracking)

The additional counting and shipping the samples to CLS would result in extra expense and time.

Sample Owners

Handling of samples and sampling equipment (e.g., vapor sampling equipment) is an unresolved unknown. Also, will the unused sample and laboratory sample waste be returned to Hanford for disposal or disposed in a commercial facility? If it is shipped offsite (to a commercial disposal facility or to CLS), is there a liability issue for DOE?

CBC

As the facility owner, CBC has made it clear that for the construction bond(s) to be issued as a Washington State bond, they (CBC and the bond underwriter) will need assurance from DOE that they will maintain residence at the new lab, and pay the lease required to repay the bond. This conflicts with the standard DOE-RL termination for convenience contract clause.

The WSCF facility manager had stated that RJ Lee Group would consider sharing and/or turning over the CBC laboratory to the follow-on contractor as RJ Lee Group would still have commercial work (non-Hanford) flowing through the CBC laboratory. This is a major issue as it impacts DOE's ability to compete a contract for subsequent work and maintain local analytical lab capability.

4.6 MAINTENANCE ISSUES

WSCF has performed non-routine work on the facility exhaust fans 30 times in the last 15 years (average two times per year). WSCF has two exhaust fans (EF-1 and EF-2, each located in a parallel nominal 50% capacity HVAC train). Industry experience indicates that these fans could run without issue for 10 years. Each time the fan goes down, WSCF goes down for one day to one week. During the required maintenance, if exhaust fan EF-2 must be replaced, there is a deck hatch to bring out the fan. There is no deck hatch for EF-1 so EF-2 exhaust duct work must first be removed to allow EF-1 to be removed. A similar accessibility issue exists with air handler units AHU-1 and AHU-2. Replacement of these fan elements would require extensive housing modification on the respective units to replace the fans. This problem goes back to when the facility was built. The design plans included an extremely cramped mechanical room that did not include proper access to work on or remove failed equipment. The fan failures do not include the number of times the control system has been worked on, which also brings down the exhaust fans. The HVAC control system is configured in such a manner that both fans must be shut down in order to bring the dual train of exhaust fans on line successfully. Full facility shutdown is required to restart both HVAC trains. Following full resumption of HVAC service, a radioactive swipe survey is required in order to start the lab back up.

These fans have been experiencing bearing failure at an alarming rate, and the facility presently has two spare fans that need the bearings replaced. It is believed that these bearing failures are being aggravated by the fan base, which is not structurally sound enough to keep the fan from warping resulting in bearing wear. The recently replaced fan showed unexpectedly high levels of vibration when initial readings were taken. Upon further review there was recognition of fan design changes, including changes in the sensor location that resulted in a different vibration signature. Weekly vibration readings on the new fan show a stable, unchanged continued elevated level of vibration, but the bearing vibration analysts have reduced their level of concern from their initial evaluation. Following initial concern that failure of the new fan bearings may be imminent, WSCF began development of a contingent work package for in-situ replacement of the fan bearings should they fail before the local vendor can rebuild one of the failed fan assemblies. This will be another new evolution for WSCF; however, the probability of success is much lower than if the bearing replacement professionals do the job in their facility. It will probably require another learning curve with the respective down time.

WSCF is working with factory representatives, and has several proposals to fix these issues.

- Install a roof hatch over the exhaust fans: If WSCF continues to operate, the assessment team recommends the installation of the hatch as a required upgrade, which is expected to cost $200,000. The cost of the facility down time during hatch installation is $100,000. The hatch will allow each exhaust fan to be easily removed and replaced, which will cut the downtime for fan removal and replacement from four days to two days.
- Install stronger fan bases: The assessment team recommends the installation of these stronger bases as a required upgrade to prevent the fans from warping causing excessive bearing wear. The cost is $20,000 each plus the appropriate down time.
- Install a third fan in an expanded maintenance room: The third fan would be used as a backup fan. This upgrade is probably not required, and if performed, although the exhaust fan access would be satisfactory, the air handlers would still be cramped. This would result in significant down time to construct the expanded maintenance room. The estimated cost of this upgrade is $2,500,000. This expanded maintenance area and additional fan would give WSCF a backup fan for continuity of operations.

Several other recommended projects at WSCF have also been deferred:

- Replacement of duct heaters at a cost of $532,700, which is necessary to maintain the proper temperature in the air supplied to the laboratory.
- Conduct an engineering study for heating, ventilation, and air conditioning (HVAC) at a cost of $42,500.
- Repair the roof on building 6266 at a cost of $115,000.

In order to be sure similar maintenance problems do not exist at the CLS, the fan room was inspected. At CLS, the exhaust fans and air handlers have operated for over eight years with no major problems. The CLS mechanical room includes all the needed support equipment with a very spacious layout allowing easy access. CLS currently does not have a backup fan, however it has adequate space to perform maintenance.

4.7 UNION ISSUES

The RL contractor industrial relations (CIR) experts developed questions that MSA would be required to answer before proceeding with Plan A. They are:

- Pension/Benefits: MSA states that RJ Lee will perform both commercial and Hanford work, but they plan to manage commercial work separate from DOE. How does RJ Lee guarantee that HAMTC workers will not perform commercial work? If employees are performing both HAMTC and commercial work, how will RJ Lee pay for the pension/benefits associated only for the work being performed for the Hanford Site? How will the coding, charging, and billing be documented to accurately reflect work being done at Hanford only? If these costs are added as a general and administrative (G&A) rate, is it less costly to the Government?

  It is noted that page 22 of 72, Table 6, of the AMSP states the process for managing Hanford and non-Hanford work is an "unknown" and will have to be established. However, DOE is requesting a response to determine impacts as identified in this document.

- Workers' Compensation: If RJ Lee performs both commercial and Hanford work and the same person is also performing both commercial and Hanford work either daily, weekly, or monthly, how will coding, charging of rates, and billing be documented to accurately reflect injuries that are limited to Hanford work?

Rates for Hanford workers' comp (WC) are different than what a commercial entity would pay. How would RJ Lee ensure that they are not receiving an industrial injury (commercial work) claim under Hanford workscope (i.e., employee actually injured performing commercial work yet claim filed under Hanford WC)?

- Union Negotiations: What is the benefit of RJ Lee having a standalone CBA with HAMTC versus continuing being signatory to the CBA MSA has with HAMTC? RJ Lee does not have the authority to bind DOE to any wages, benefits, etc. Only the prime contractors are able to perform this function with approval by DOE for economic parameters (reference DOE Order 350.1, Chapter I; Clause H.6 and H.7 of MSA's contract with DOE).

  Page 20 of 72, Section 3.3 of MSA's submittals states "HAMTC chemical technologists will be included in the formulation of the workforce structure which will require a separate contract negotiation with HAMTC. It is assumed that the current bargaining unit benefits in place at the time of transition will be included as part of that labor agreement." From an economic perspective, CIR would not recommend this option at this time for the following reasons:

- MSA's current HAMTC agreement allows newly hired (non-incumbent) employees to choose either the Hanford Site Pension Plan/Benefits or the Market-Based Benefit package. This option was only authorized by DOE to MSA. This agreement does apply to those teaming subcontractors that are signatory to the MSA CBA with HAMTC; however, it does not flow down any further.

- With the exception of Parsons[1], it is unprecedented for a subcontractor to have its own CBA with HAMTC. CBA's have always been between the prime contractor and HAMTC. There are potential impacts to the continuity of operations on the Hanford Site. An example of continuity of operations is the Hanford Site wide bump and roll. Bump and roll is invoked if there is a reduction of force and WCH, CHPRC, MSA, WRPS, and ATL contractors are all party to the sitewide bump and roll. Let's say that 10 chemical technologists represented by HAMTC are laid off from ATL. If any of these employees are senior to those working for WCH, MSA, WRPS, or CHPRC, the ATL employee(s) would bump the employees of these contractors and the employees bumped would be laid off and the contractor would have a new employee from ATL and need to retrain to their facility/company policy. DOE has a contractual relationship with the prime contractor; however, DOE does not have a contractual relationship with the subcontractor(s) and as such, the Department's role in ensuring continuity of operations, cost impacts, potential labor impacts as well as labor harmony are diminished. Also, while a CBA can contain whatever provisions are negotiated between the two parties, it cannot unilaterally change the terms and conditions of

[1] There was one exception whereby Parsons does have a separate CBA with HAMTC. This apparently was agreed to when the fabrication shop (operated by Parsons) was outsourced in 2002 and it was determined that employees would not be harmed and basically the same CBA employees were being covered by was used when the outsourcing occurred. Having this separate CBA between a subcontractor and the union has created issues over the years, some of what are identified in this message and DOE is looking into those issues as are the contractors based on the impacts to them. In discussions we have recently had with HQ-GC, CBA's between other than the prime contractor and the union is not recommended for the reasons we state in our analysis. Again, that being said, and as stated in our analysis document, the labor law is clear that employees may organize and choose whom they wish to represent them; however, it should also be clear that the Department should have control over the impacts to the continuity of operations on the Hanford Site, which include both direct and in-direct dollars, as well as ensuring that benefits approved do not increase the long-term liability of the Department. Lastly, a CBA is between the union and the contractor and although these two parties ultimately agree on the terms and conditions of the CBA, it does not mean that DOE will automatically pay for associated costs (i.e., wages, benefits, etc.) as the union does not have the authority to bind Government funds and the contractor does not have authority to bind Government funds without prior approval from the DOE contracting officer of economic parameters.

other contractors CBAs. The bump and roll is a specific article in each of the prime contractors' individual CBA with HAMTC and clearly states which contractors this article applies to. Therefore, if HAMTC and RJ Lee sign a separate CBA, and HAMTC employees are to be part of "bump and roll," then HAMTC would be required to negotiate this particular article and any changes to it with each prime contractor. This process would also apply for the article in each of the CBA's between the prime contractors and HAMTC on Labor Assets Management Program, the process used to advertise positions whereby specific contractors are spelled out that have first opportunity to apply for an open position with other named contractors and seniority is adhered to for selection. If all contractors agreed to change their CBAs, the Department's concern would be the effect on DOE continuity of operations. Example: RJ Lee has a need to lay off employees due to lack of work, and some RJ Lee employees (who have worked both commercial and Hanford work and maybe more commercial than Hanford) have seniority and bump, for example, WCH employees. WCH now has to train new employees to their company/facility specific training and dollars expended to train the workers who were laid off are lost. While the labor law is clear that employees may organize and choose whom they wish to represent them; it should also be clear that the Department should have control over the impacts to the continuity of operations on the Hanford Site which include both direct and in-direct dollars, as well as ensuring that benefits approved do not increase the long-term liability of the Department.

How does MSA plan to address the jurisdiction issue they identified on Page 22 of 72, Table 6, also listed as a challenge? DOE's concern is continuity of operations. Page 18 of 72, section 3.1, states model could be applied to 222-S. Has ORP been contacted for impacts? Are there impacts to HAMTC workforce with ATL?

Listed below are additional questions that were raised with another contractor who proposed a similar approach:

- Has MSA flowed down the litigation and claims clause to RJ Lee? If so, how would this work regarding commercial work being performed by RJ Lee (issue raised by RL-OCC)?
- If HAMTC employees perform both commercial and Hanford work, would RJ Lee use AMH for return to work (especially if the person injured themselves on the commercial work, but needs a release to return to Hanford work)?

4.8 ISSUES WITH EQUIPMENT TRANSFER

Per the RL property manager, WSCF laboratory equipment can be excessed to General Services Administration (GSA) for listing on the National GSA excess list. During that time, any organization in the Federal Government can take ownership of the equipment. Only after it has gone through this process will the equipment be made available for CBC to receive it. It is anticipated that a large part of the equipment would not make it to CBC due to the potential demand by other entities.

The best way of handling the WSCF equipment is to supply it as government-furnished property to CLS per Federal Acquisition Regulation 45.106, *Transferring Accountability*. This will enable the equipment be to be used by CLS during their contractual period, while the government maintains ownership.

MSA has expressed that cost savings would be achieved by using the government-furnished lab equipment and facilities for both commercial and Hanford work. The team believes that there would be potentially un-resolvable and complex legal issues with sharing government-furnished equipment for commercial work.

4.9 LIM'S LICENSE TRANSFER

Horizon software is licensed by Chemware, Inc. of North Carolina. Under paragraph 13 of the license, Chemware, Inc. may require an assignment fee to transfer the license. If the scope of work is transferred from Fluor (original licensee) to CLS (as it was), then the Fluor agreement with Chemware will be assigned to the successor contractor (CLS) and no assignment fee is required. In this case paragraph 13 does not apply.

4.10 RADIOACTIVE MATERIAL LICENSE

CLS's current license is only for a medium-sized laboratory. They would need to receive an upgraded license for a large laboratory to increase the amount of radioactivity they can have in the laboratory. This will ensure that they could receive the samples that WSCF currently processes. CLS is currently in the process of upgrading their license and in discussions with Anine Grumbles, the DOH Radioactive Material Licensing agent. Ms. Grunbles stated that the upgrade could be easily done as DOH has high confidence in the radiological practices of the laboratory staff at Hanford.

4.11 SHIPPING REQUIRED FOR SAMPLES

Cost impacts for shipping samples offsite vary depending on origin and history of the sample. For many groundwater samples, there is enough historical data that allows the project to send the samples to an offsite laboratory without performing a radiation count prior to shipment. Thus the only costs associated with these samples would be the cost to transport them to the offsite laboratory.

However, other samples will require radiation counting if the samples are to be shipped offsite (as required by the radiation shipment record – RSR) at either the WSCF (or another facility that could be set up if WSCF was closed down) or 222-S laboratory. During the sampling, the radiation protection technicians (RPTs) determine the level of counting required and review the project's Sampling and Analysis Plan (SAP). Based on the guidance, the samples are counted (screened) at WSCF for alpha/beta contamination for a cost of ~$100/sample and gamma counting $170 or at 222-S for alpha/beta and gamma (GEA-gamma emission analysis) for a total cost of $400/sample. To facilitate this requirement, the samplers take an extra sample to take to the laboratory and then store the remainder of the sample in a controlled environment (i.e. 4° C) until the data are obtained to complete the RSR to ship offsite. The results are usually available the next day and the samples are then ready to be transported through 1162 building. At 1162 they are logged and transported to local area laboratories or shipped via FedEx to non-local laboratories.

The total counting cost with radiation shipment would be approximately $2.8M/year (at average of 29,400 samples per year). Currently all samples coming to WSCF get an abbreviated count. This count is not as extensive as the count required for shipping.

Sample Source	Count Type	Number of Samples	Percent Count	Count Cost per Sample ($)	Total Cost ($)
Groundwater	Alpha/beta	6,554	31	100	655,464
	Gamma, alpha/beta	634	3	270	171,266
Tank Operations	Gamma, alpha/beta	3,298	100	335	1.104,830
Other	Alpha/beta	2,479	50	100	247,900
	Gamma, alpha/beta	2,479	50	270	669,330
Total		29,400			2,848,790

For samples that require analyses with short hold times, primarily liquid samples being analyzed for hexavalent chrome, that require radiation counting, an onsite capability to perform the chrome analysis would need to be established to ensure that the 24-hour hold times were met. This could be done at the sample facility that would perform the radiation counts for sample shipment.

Shipping Cost Notes:

Average samples per day = 120
Trucks ship 4 to 5 ice chests per trip; ice chests hold 3 to 10 samples each
Ice chests per day range from 12 to 40
Trips per day = 3 to 9; equates to avg 2 trucks running full time per day
2 FTEs = $250K/year
Truck rental = $10K total 2 trucks per year
Fuel = $20/trip = $120/day (avg 6 trips per day)
Total fuel = $120 x 250 days = $30,000
Total cost = $290K per year or approximately $10 per sample

Total costs to ship current WSCF samples offsite would be $3.1 M per year

4.12 ADVANTAGES/DISADVANTAGES OF PLANS

In determining potential issues and costs associated with each of the plans submitted, the following advantages and disadvantages were identified.

Advantages of Plan A

- The facility would be commercialized. DOE orders and regulations would be applicable only as required through the prime Hanford Site contract(s) flowdown to subcontractors. The state would be the regulating body as granted by the U.S. Environmental Protection Agency (EPA) and U.S. Nuclear Regulatory Commission (NRC).
- The facility would be maintained by CBC.
- Most employees would have a shorter commute.
- No long-term fixed costs for DOE (note: during contract period through 2019)
- DOE would not be responsible for future equipment purchases
- Small business benefit to DOE

Disadvantages of Plan A

- All WSCF equipment will have to be moved to and installed in CLS. This would involve considerable installation costs (approximately $100K) and continual property management by DOE as equipment would still be DOE property, as well as some down time to move and recalibrate. (note: equipment maintenance will be addressed in contract)
- Maintenance and operations of duplicate facilities during transition: Moving to CLS will interrupt sample analysis and require duplicate analysis and require maintaining duplicate accreditations during transition (CLS & WSCF). This may impact the customers and it involves additional costs.
- The CLS facility would have to be remodeled (existing classrooms and administrative space), as well significantly expanded to include all of the WSCF operations. CBC would bear the initial costs (through WA bonds) with recoup by lease back to CLS.
    - New administrative offices
    - Additional laboratories and hoods

- Expansion of laboratory sample receipt area
- Sample archive area
- Below grade counting room
- Waste storage area

- Samples would have to be shipped to an offsite facility. This would require an onsite additional rad count, an RSR calculation and completion, as well as transportation and shipment tracking. Also if transportation is done by RJ Lee, who would the responsible party for any accident both on and offsite? CLS also plans to return any unused sample back to the site, which will require additional transportation and handling costs.
- *Due to offsite transportation issues, hold times such as hexavalent chromium (24 hours) will probably not be met on water samples.
- *Samples that require short turnaround times may also be impacted by offsite shipment requirements thus delaying field activities (i.e. count required for shipment may result in an extra day to complete analyses requested by customer).
- Staff relocation and transference of benefit packages.
- HAMTEC issues exist.
- *Impact M-14 agreement that requires DOE to meet hold times and also maintain onsite laboratory to perform QA oversight of offsite commercial laboratories.
- Impact beyond contractual period (i.e. past 2019) may create some problems with facility/equipment transfer.
- CLS does not currently have the same scope of accreditation that WSCF has (WA state and AIHA). It is expected that WSCF staff will impact this enabling CLS to obtain the needed accreditations.
- WSCF can currently dispose any waste and unused samples within the Hanford infra-structure (ERDF and ETF) while CLS plans to return unused samples to the site (incurring additional shipping and handling costs) and contract with a commercial mixed waste disposal company for lab waste disposal.
- *DOE must maintain the ability to competitively procure current analytical capabilities after MSA contract period and contract winner will take over CBC facilities and the lease agreements would transfer. This is a primary concern to ORP as WTP will just be starting operations and would need this capability through 2050.

* Note: Major Issue

Advantages of Plan B

- Minimal amount of disruption to the people, customers, equipment, and facility.
- Fully accredited by WA State DOE for analysis of air, water, and soils, and also American Industrial Hygiene Association (AIHA) for tank vapor, asbestos, etc.
- Facility is onsite so additional radiation counts and offsite transportation is not required.
- Facility is onsite so short hold times can be met per the M-14 agreement.
- WA DOH license for radiation is not required.
- Site interfaces are much more efficient.

Disadvantages of Plan B

- Achieving a set cost structure commensurate offsite labs could not be achieved. All of the requirements levied on Hanford facilities would still be in effect. This includes DOE rules and orders. This makes the facility less efficient and higher cost per sample.

- If operated as ready to serve facility, cost to DOE would continue as fixed costs (~50 FTEs would be accounted for in ready-to-serve model). The contractor could be incentivized to evaluate changes to operating structure to reduce costs (i.e., option C).
- The facility would continue to be maintained by site serves, unlike CLS, which would be maintained by CBC operations.
- Fan and duct heater upgrades must be completed.
- MSA has requested an expansion of a west wing to WSCF at a cost of $20M. DOE to date has denied this request.
- WSCF currently has major issues with laboratory down time and sample throughput.

Advantages of Plan C

- Uses a commercial model to reduce costs.
- Minimal amount of disruption to the customers, equipment, and facility.
- The lab operating procedures would be run as a commercial lab.
- Samples would not have to be shipped to an offsite facility (cost savings).
- Fully accredited by WA State DOE for analysis of air, water, and soils, and also AIHA for tank vapor, asbestos, etc
- Facility is onsite so additional radiation counts and offsite transportation is not required.
- Facility is onsite so short hold times can be met per the M-14 agreement.
- WA DOH license for radiation is not required.
- Site interfaces are much more efficient.

Disadvantages of Plan C

- The facility would not be fully commercialized.
- The facility would be maintained by onsite personnel and crafts.
- Fan and duct heater upgrades must be completed.
- WSCF currently has major issues with laboratory down time and sample throughput.

4.13 RISKS

Risks	Plan A	Plan B	Plan C
Political	• May have to negotiate a new TPA language (WSCF built per M-14 requirement) • Location at college campus/populated area • Issues with HAMTC • Perception of moving analysis work to CLS-DOE pay for setting up a major commercial lab	• Does not contribute toward SBA goal	• Does not contribute toward SBA goal
Scope	• Hold times may not be met for specific analyses (i.e. Cr+6) • Sample analysis turnaround may not me met for continued operations of processing facilities • Additional time will be added to solve unknown field hazards due to sample shipping (industrial hygiene)		
Schedule	• Low estimation of required transition time • Quick turnaround timed samples will incur an additional day due to offsite shipping-project impact • Proposed transition schedule occurs in the same timeframe as a large increase in sample load as well as completion of 6 TPA Groundwater milestones • Does not address the current sample load issues to meet project requirements to support meeting TPA milestones • ASMP only addresses analytical support through 2019. WTP begins operation in 2020 and there is a concern that the offsite lab will not be sufficient to support process operations	• WSCF would have to be one of the last facilities D&D'd • Implementation of second shift operations will not completely address the current sample load issues to meet project requirements to support TPA milestones	• WSCF would have to be one of the last facilities D&D'd • Implementation of second shift operations will not completely address the current sample load issues to meet project requirements to support TPA milestones
Technical	• Failure to fully accredited with WDOE/DOE • Past performance has caused some concern with ORP and WDOE	• Issues with WSCF up time due facility equipment conditions	• Issues with WSCF up time due facility equipment conditions
ES&H	• Security of Facility • Ensure laboratory containing rad samples be built as separate facility (not connected to student access area) • Outside Hanford secured area	• High failure of exhaust fans (maintenance and down time)	• High failure of exhaust fans (maintenance and down time)
Cost	• Unidentified operating costs (i.e. shipping, and disposal) • Unknown cost structure to support activities currently provided by WSCF at no additional costs (e.g. interim reports)	• High sample costs with respect to commercial labs, except for quick turnaround samples	• Medium sample costs with respect to commercial labs

5.0 MANAGEMENT CONSIDERATIONS

Management considerations encompass both positive and negative aspects.

For Plan A, moving analytical operations to the CLS, would be an advantage to CBC. The president of CBC, Dr. Cummins, is very supportive of this plan. He feels it would allow for an intern program, possibly leading to a future curriculum and resulting degree for the students. This is the reason CBC is willing to support future construction of CLS with a WA bond issue. It will also result in a new laboratory on the CBC campus. Overall, this plan would be a development opportunity for the community.

RJ Lee is a small business operation. It supports DOE's goal to contract work to small businesses.

Plan A consists of transferring analytical operations (including personnel and equipment) off the Hanford Site. DOE needs to evaluate if this plan would be beneficial to the government.

A disadvantage for Plan A is that the proximity of HAMTC workers, students or other workers in the same facility could create problems.

TPA regulators may have an issue with removing all low-level onsite laboratory capabilities. In the early 90s WSCF was constructed to meet the M-14 TPA milestone that ensured Hanford would have onsite low-level mixed waste laboratory. The scope of WSCF is to include low-level analysis and quality control of offsite DOE contract labs. Another driver for this milestone was to ensure that sample hold times were met. This may result in a new agreement with Ecology and EPA.

For Plan B and C, an evaluation should be performed to determine if the lowest lifecycle cost is to upgrade and continue WSCF operations or move to CLS.

6.0 REFERENCES

1. DOE-CBC Office of Cost Estimating and Analysis, "Cost Estimate and Analysis Report for the Waste Sampling and Characterization Facility (WSCF) Commercialization," dated March 22, 2010.
2. Management Plan, Quality Assurance Program Description, Rev F-2, TFC-PLN-02, REV F-2, February 21, 2010\
3. Title 10 of the Code of Federal Regulation, Part 830, Subpart A (10 CFR 830, Subpart A), "Quality Assurance Requirements;"
4. DOE O 414.1C, "Quality Assurance," for facilities and projects within the scope of work;
5. DOE Quality Systems for Analytical Services, Revision 2.5, November 2009
6. DOE/RL-96-68, HASQARD, Rev. 3 Volume 2, Sampling Technical Requirements Effective Date: 6/1/07
7. Washington Department of Health Radiation License for R.J. Lee Group, Incorporated, Center for Laboratory Sciences, WN-L0223-1 Amendment No. 8, expires April 30, 2011
8. Washington Department of Ecology Accreditation
9. AIHA

7.0 CONCLUSION

The ASMP proposes several potential plans for the work currently being performed by WSCF:

- Plan A is for the commercialization of WSCF by transferring all of the work to the CLS located at CBC in Pasco, Washington.
- Plan B is to continue to run WSCF as it has been run in the past.
- Plan C is to continue to run samples through WSCF, but to commercialize operations wherever possible.
- Plan D is to outsource all WSCF work to qualified offsite laboratories.

For Plan A:

1. DOE orders and regulations would be applicable only as required through the prime Hanford Site contract(s) flowdown to subcontractors, potentially increasing the efficiency of operations.
2. The State of Washington (Ecology and DOH) would be the regulating body for both regulatory analysis and radiological analysis.
3. CBC would own and maintain the facility. DOE would not have any long-term fixed costs.
4. The CLS facility would have to be remodeled and significantly expanded or new facility constructed to include all of the WSCF operations.
5. CBC would bear the initial costs (through WA bonds) with recoup by lease back to DOE. According to CBC, a new laboratory could be fully operational in approximately three years.
6. All WSCF equipment will have to be moved and installed in the remodeled CLS laboratory and a new laboratory building.
7. During transition, MSA will be forced to maintain duplicate facilities and accreditations, and run duplicate samples at CLS and WSCF, which will involve extra costs.

8. Samples that require short turnaround times (e.g. hexavalent chromium) may also be impacted by offsite shipment requirements causing hold times to be missed or delaying field activities, and any ongoing processing.
9. DOE must also require a lease transfer clause in the CBC/DOE/MSA laboratory contract to ensure that whoever is awarded the follow-on Mission Support Contract is able to run the CLS facility. This is a primary concern to ORP as WTP will just be starting operations and would need this capability through 2050.
10. Many HAMTC issues exist with this option.

For Plan B:

1. WSCF would be run as it has been in the past with a minimal amount of disruption to the people, customers, equipment, and facility.
2. The facility is onsite so additional radiation counts and offsite transportation are not required.
3. Short hold times can be met per the TPA, as well as meeting continued processing needs.
4. Achieving a set cost structure competitive with offsite labs could not be achieved.
5. All of the requirements levied on Hanford facilities would still be in effect making WSCF less efficient and higher cost.
6. If operated as a RTS facility, cost to DOE would continue as fixed costs.
7. Upgrades would have to be completed (exhaust fan and duct heaters) or WSCF will continue to have issues with laboratory down time and sample throughput.

For Plan C:

1. WSCF would be operated like a commercial laboratory wherever practicable. In particular, commercial lab operating procedures would be utilized.
2. The facility is onsite so additional radiation counts and offsite transportation are not required.
3. Short hold times can be met per the TPA, as well as meeting continued processing needs.
4. The facility would not be fully operated as a commercialized lab, and DOE orders and regulations would be in effect.
5. Radiation licensing from the DOH would not be required, except for air emissions (as is currently required).
6. Upgrades would have to be completed (exhaust fan and duct heaters) and WSCF may continue to have issues with laboratory down time and sample throughput.

In any of these options, WSCF continues to operate for three to four years, and critical upgrades to the facility will be required.

Plan D is not considered viable due to the site issues and hold times that require an analytical lab within 25 miles.

Recommendations

As noted, all of these plans have advantages and disadvantages.

Plan A (commercialization of WSCF at CBC) has the advantage of operating in a new facility with potentially lower operational costs (if the operational savings exceed the sample shipping costs and lease costs). Ultimately there is not enough data to determine if this plan would result in lower operational costs. There are issues that require resolution if this plan is to be considered. The main issue concerns the resolution of all union questions. Another serious issue is to verify that Mission Support Alliance (MSA) can sign any lease for the lab at CBC.

Before the assessment team would be able to recommend that Plan A be pursued, MSA would have to satisfactorily address the following issues:

- Answer all questions from the HAMTC sections with definitive answers.
- Verify the estimated shipping cost (including counting) for all samples under Plan A.

- Estimate the operational cost savings under Plan A. The estimate should include cost details including the basis of estimate.
- Verify MSA is willing to sign for the CBC lease (report the lease terms to DOE).
- Verify with details of the $60.5M cost savings.
- Specify and calculate cost for disposing of residual samples and laboratory waste.
- Verify Ecology and EPA position on the potential shutdown of WSCF and transfer of operations to CLS.

Office of Environmental Management

Cost Estimate & Analysis Report
for the

Waste Sampling and Characterization Facility (WSCF) Commercialization
(Under Contract No DE-AC06-09RL14728)

Prepared for

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March 22, 2010

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Table of Contents

1. Executive Summary 4

2. Independent Review and Validation Overview 5

2.1 Independent Review and Validation (IR&V) Purpose 5
2.2 IR&V Goals and Objectives 5
2.3 IR&V Key Evaluation Criteria 6
2.4 Team Composition 6

3. RJ Lee Group Inc., ASMP Independent Review and Validation Summary 7

3.1 Life Cycle Cost Considerations 8
3.2 WSCF Site Functionality Costs 9
3.3 Transition Costs 9
3.4 Legacy Costs 12
3.5 Other Cost Considerations 12

4. Ready To Serve (RTS) Analysis 13

4.1 Determine the costs of HAMTC employees in the ready to serve WSCF budget 13
4.2 Determine the viability of zeroing out the Ready to Serve costs at WSCF 14

5. Conclusion 14

APPENDIX A 15

APPENDIX B 16

APPENDIX C 17

1. EXECUTIVE SUMMARY

The United States (U. S.) Department of Energy (DOE), Environmental Management Consolidated Business Center (EMCBC), Office of Cost Estimating and Analysis (OCE&A) was requested to join an Interdisciplinary Project Team (IPT) from the Richland (RL) Operations Office to conduct a review of the ramifications of commercializing the Waste Sampling and Characterization Facility (WSCF) and moving operations to the RJ Lee Group at Columbia Basins College in Pasco, Washington. The OCE&A participated remotely in the IPT from the EMCBC, conducting an Independent Review and Validation (IR&V) of the Analytical Services Master Plan (ASMP), under RL Contract No. DE-AC06-09RL14728 Site Services Contract. The OCE&A also contributed a Rough Order Magnitude (ROM) Transition Cost Estimate and other analysis as requested by the Site.

Based on the review and analysis of the ASMP's proposal for the Commercialization of the WSCF, the cost savings potential, as stated at $60 million over ten years could not be validated. The IR&V Team identified the need for additional investigation into other cost considerations that would have an impact on the potential for cost savings as presented in the ASMP.

Findings deemed critical to the cost savings for the Commercialization of the WSCF through relocation to the RJ Lee Group Center for Laboratory Sciences (CLS) at the Columbia Basins College in Pasco, WA are noted in this report.

The EMCBC OCE&A further recommends that RL proceed with responding to the proposal, pursuing a comprehensive, detailed cost estimate for the total project costs of the plan. Following this estimate, the potential for cost savings to the Richland Operations Office would be clarified and better understood to make a determination on the proposed plan.

2. INDEPENDENT REVIEW AND VALIDATION OVERVIEW

2.1 Independent Review and Validation (IR&V) Purpose

In support of the Richland Operations Office (RL), Interdisciplinary Project Team (IPT), the EMCBC OCE&A was tasked to act as lead for the completion of an Independent Review and Validation (IR&V) of the Site Services Contract Analytical Services Master Plan (ASMP) costs and cost savings.

The IR&V of the ASMP will serve as the cost analysis of the IPT's response for the proposal to commercialize the WSCF through relocation to the RJ Lee Group Center for Laboratory Sciences (CLS) at the Columbia Basins College (CBC) in Pasco, WA. The intention is to determine the price reasonableness and validation of the costs and projected cost savings of the proposal.

Conducting an IR&V of a proposal is crucial to establishing confidence in the contractor developed cost estimate and verifies realism, completeness, and consistency with the planned work scope. This process verifies that the submitted plan adequately reflects the scope of work and provides reasonable cost estimates and potential savings to accomplish the plan. It also confirms that the contractor's costs and cost savings are traceable and accurate and reflect realistic assumptions. It is a good business practice that cost estimators and organizations independent of the program office validate that all cost elements and savings are credible and can be justified by acceptable estimating methods, adequate data, and detailed documentation.

2.2 IR&V Goals and Objectives

The IR&V is a thorough review of the ASMP, supporting estimate documentation, cost savings, and associated work packages for cost realism, reasonableness, completeness, consistency, and compliance with generally accepted DOE and industry cost estimating processes. The IR&V of the ASMP will focus on validating whether the proposal's life-cycle cost savings are realistic and all inclusive.

The end result of the IR&V is a report that identifies any Findings that will provide RL decision makers with an assessment on the merit of the ASMP.

Findings are deficiencies within the ASMP and should be discussed with and addressed by the contractor prior to determining the merit of the ASMP. Findings within ASMP include deficiencies such as:

- Major work scope not considered or omitted
- Estimate definition is inconsistent with project execution status
- Quantity development is not consistent with technical requirements

- Qualitative or quantitative deficiencies are present that affect the usefulness of the ASMP

2.3 IR&V Key Evaluation Criteria

The IR&V evaluated the following plan attributes associated with the ASMP:

- Traceability. Information is presented in a traceable fashion containing supporting documentation and technical data. The IR&V must be able to evaluate and crosswalk between all costs / cost savings and the scope of work that the plan captures.
- Reasonableness. Information is presented in a logical manner and can be evaluated at a sufficient level of detail to allow the IR&V to assess the reasonableness of estimated costs / cost savings. Estimating methodologies used to develop the costs / cost savings are reasonable given the project scope definition.
- Soundness. Information, assumptions, and recommendations presented within the plan must be evaluated to assure they are valid. The IR&V will carefully consider costs and cost savings based on expert judgment and review assumptions used to develop them.
- Verification. Information presented must be verifiable by the IR&V. The IR&V will assess databases that were used to verify the technical parameters on the cost and cost savings elements.
- Validity. Information presented must be logically correct, justifiable, and well-grounded. The IR&V will review the ground rules and assumptions. The IR&V will assess cost estimate components (material, labor rates, production rates, subcontract estimates, etc.) to verify reasonableness of costs and cost savings used in the plan.
- Accuracy/Consistency. Information presented is well organized, cohesive, supportable, and easily understood.
- Completeness. Information presented must contain all necessary data, assumptions, and pertinent information.

2.4 Team Composition

This IR&V has been prepared by the EM Office of Cost Estimating & Analysis. The individuals involved and their roles are identified in the following table:

Name	Organization	Phone No./e-mail	Role
Karen Flynn	RL, Program Manager	(509) 376-7323 karen_l_flynn@rl.gov	Requestor
Richard Wible	RL, Site Infrastructure Engineer	(509) 373-6688 richard_a_rick_wible@rl.gov	IPT Lead
Billie Mauss	RL, Physical Scientist	(509) 373-5113 billie_m_mauss@orp.doe.gov	IPT Member
Steve Balone	RL, General Engineer	(509) 376-0236 steven_n_balone@rl.gov	IPT Member
Steve Olszewski	EMCBC, Senior Cost Engineer	(513) 246-0231 steve.olszewski@emcbc.doe.gov	Cost Estimation & Analysis
Michael Mills	EMCBC, Cost Estimator	(513) 246-1372 michael.mills@emcbc.doe.gov	Cost Estimation & Analysis
Kevin Barry	EMCBC, Cost Estimator	(513) 246-1371 kevin.barry@emcbc.doe.gov	Contributor
Terry Brennan	EMCBC, Assistant Director, OCE&A	(513) 246-0546 terry.brennan@emcbc.doe.gov	Reviewer

3. RJ LEE GROUP INC., ASMP INDEPENDENT REVIEW AND VALIDATION SUMMARY

The ASMP Independent Review and Validation (IR&V) established the following cost considerations that were not reflected in the proposal. These costs would have an impact on the potential life-cycle cost savings; therefore the Life Cycle Cost Analysis (LCCA) is overstating the cost savings presented in the ASMP. These Findings are summarized in the table below:

Table 3.1 – ASMP Cost Considerations of Not Included in the LCCA

1. Life Cycle Cost Considerations

- Distance proximity from sample source to CBC in Pasco, WA
- Time proximity from sample source to CBC
- Transportation costs for samples

2. WSCF Site Functionality Costs

- Mobile laboratories storage function
- Sample equipment cleaning facilities
- Operational costs of functions

3. Transition Costs

- Laboratory and functionality construction (storage)
- Expansion costs
- Relocation costs
- Communications / HLAN

4. Legacy Costs

- D&D costs of WSCF
- Surveillance & Maintenance of WSCF

5. Other Cost Considerations

- Protection of real property
- LEED construction cost

3.1 Life Cycle Cost Considerations

- **Distance Proximity from Sample Source to CBC in Pasco, WA**

(Assuming the origin of test samples is Hanford's Central Plateau, 200 West Area)

CBC in Pasco, WA is about 40 miles away (one way) from the current WSCF location. This distance will have a life cycle cost effect on the fuel costs for transporting samples from the source (site) to the laboratory. With typical fuel efficiencies for a sample delivery trucks, a round trip for sample delivery could cost as much as $20 on average per trip for fuel alone.

- **Time Proximity from Sample Source to CBC**

Based on the route available, the set limits on speed, and public use of those routes it is estimated that the shortest time proximity from sample source to CBC would be approximately one (1) hour apart. As stated in the ASMP, depending on the tests required, holding times may need to be met, meaning the analysis must be run within a specified time after the sample is taken. Some Inorganic testing (CR6 and Anions) require 24 and 48 hour turnaround times. This time proximity has a cost associated with it.

- **Transportation Costs for Samples**

Depending on the schedule of sampling; the number of test samples; the volume of those test samples; and the necessary tests required, the operation could require dedicated sample delivery vehicles and drivers. A fleet of sample delivery vehicles would have the cost of vehicle drivers/operators, as well as costs for fuel, maintenance and insurance of the transportation equipment. These costs would have to be available 'on-the-ready' and would reasonably increase the drivers/truck service level.

3.2 WSCF Site Functionality Costs

- **Mobile Laboratories Storage Function**

The function of storing mobile laboratories at WSCF needs to be considered. The Mobile Laboratory Storage Facility (6269) is a facility that can house up to five mobile laboratories (sample trucks) providing protection for the instrumentation and computers inside the mobile laboratories from adverse weather conditions. It also contains a calibration laboratory for instrumentation used in the mobile laboratories

- **Sample Equipment Cleaning Facility**

Currently, the Sample Equipment Cleaning Facility (6268) provides cleaning for the various tools and containers used for collecting samples from the field. The tools are scrubbed and given solvent and acid baths to clean residual chemicals.

- **Operational Costs of the Mobile Laboratories Storage and Sample Equipment Cleaning Facilities**

These two facilities infer the WSCF collects field samples. The function would come at a cost to relocate to the CBC in Pasco, WA due to proximity and use. Alternative is to operate as is, where is, but with the other WSCF facilities in a 'cold standby' status. Staffing and utilities to operate those functions would require a budget.

3.3 Transition Costs

Transition costs were estimated using a site developed Statement of Work (SOW) (Appendix A) to establish the minimum needs at this stage in the process. As such, the scope of this estimate is limited to conformance with the SOW and the assumptions and limitations as stated herein. Because of these uncertainties, this estimate would be classified as a Level 5 estimate under the Association for the Advancement of Cost Estimating (AACE) classification guidelines. It is a Rough Order of Magnitude (ROM).

The total Transition Cost ROM Estimate is summarized below.

Table 3.2 – Transition Cost ROM Estimate

	ACTIVITIES	UOM	Quantity	Unit Cost	Bare Cost	Design/Engineering	TOTAL COST
1	Setting up gas bottle storage area at RJ Lee.	Sqft	3,600	$ 86.00	$ 309,600	$ 46,440	$ 356,040
2	Setting up 90 Day storage pad at RJ Lee	Sq ft	750	$ -	$ -	$ -	$ -
3	Setting up a sample archive storage area at RJ Lee	Sq ft	1,800	$ 86.00	$ 154,800	$ 23,220	$ 178,020
4	Setting up and outfitting an Office / Administrative Area (20,000 sqft) @ RJ Lee (CBC Location)	Sq ft	20,000	$ 18.00	$ 360,000	$ 54,000	$ 414,000
5	Retrofit the existing office space to lab space (5,000 sq ft) at RJ Lee.	Sq ft	5,000	$ 148.50	$ 742,500	$ 111,375	$ 853,875
	Outfit with lab furniture and required hoods. Hook up hoods to facilities.	Sq ft	5,000	$ 74.00	$ 370,000	$ 55,500	$ 425,500
6	Expand the lab into the future area (10,000 sq ft) @ RJ Lee. Outfit with lab furniture and required hoods. Hook up hoods to facilities.	Sq ft	10,000	$ 74.00	$ 740,000	$ 111,000	$ 851,000
	New Construction of Laboratory - 20,000 sq ft	Sq ft	20,000	$ 198.00	$ 3,960,000	$ 594,000	$ 4,554,000
	Outfit with lab furniture and required hoods. Hook up hoods to facilities.	Sq ft	20,000	$ 74.00	$ 1,480,000	$ 222,000	$ 1,702,000
7	Move all WSCF analytical instrumentation from WSCF to RJ Lee. Hook up instrumentation to facilities. (ASMP includes list of equipment)	Lot	1	$100,000.00	$ 100,000	$ -	$ 100,000
8	Run Samples at both facilities where possible to ensure quality. (30K worth - Billy verify estimate)	Lot	1	$ 30,000.00	$ 30,000	$ -	$ 30,000
						TOTAL TRANSITION COST	$ 9,464,435

- **Laboratory and Functionality Construction (Storage)**

New Construction of Laboratory (20,000sqft) ~ **$6.3M**

- Assumes that land is available on/near campus and will not be an additional cost.
- Assumes that 20,000 sq ft of Laboratory space will be needed to be constructed in order to be able to handle WSCF workload at RJ Lee (CBC)
- $198.00/sqft (R.S. Means 2009) – Research Lab & Facilities New Construction
- $74.00/sqft (R.S. Means 2009) – Includes equipment, delivery, and connection
- 15% for Design/Engineering support

Setting up gas bottle storage area at RJ Lee ~ **$360K**

- Assume that same size building is needed as that which is currently at WSCF - 3600 sq ft
- Open-sided storage facility for 150 canisters and unassigned storage.
- $86.00/sqft (R.S. Means 2009) – Highest value in range used due small size.
- 15% for Design/Engineering support

Setting up 90 Day storage pad at RJ Lee

- No longer needed, RJ Lee Facility at the Columbia Basin College (CBC) already has sufficient space available in their 90 Day storage pad.

Setting up a sample archive storage area at RJ Lee ~ **$180K**

- Assume that same size building is needed as that which is currently at WSCF - 1800 sq ft
- 86.00/sqft (R.S. Means 2009) – Highest value in range used due small size.
- 15% for Design/Engineering support

- **Expansion Costs**

Expand the lab into the future area (10,000 sq ft) @ RJ Lee. Outfit with lab furniture and required hoods. Hook up hoods to facilities ~ **$850K**

- Assumes that 10,000 sq ft area is "lab ready" (HVAC, Exhaust, Piping)
- $74.00/sqft (R.S. Means 2009) – Includes equipment, delivery, and connection
- 15% for Design/Engineering support

Setting up and outfitting an Office / Administrative Area (20,000 sqft) @ RJ Lee (CBC) ~ **$415K**

- Assume space is currently available (no construction or retrofit is needed).
- Cost includes Delivery, Installation, and Connecting all Furniture
- $18.00/sqft (R.S. Means 2009)

Retrofit the existing office space to lab space (5,000 sq ft) at RJ Lee ~ **$855K**

- $148.50/sqft (75% of $198/sqft – New Construction Cost)

- 15% for Design/Engineering support
- Outfit with lab furniture and required hoods. Hook up hoods to facilities ~ $425K
- $74.00/sqft (R.S. Means 2009) – Includes equipment, delivery, and connection.
- 15% for Design/Engineering support

- **Relocation Costs**

Move all WSCF analytical instrumentation from WSCF to RJ Lee. Hook up instrumentation to facilities. (ASMP includes list of equipment). Based on the information provided, a ROM of $100,000 was established as an estimate to staff personnel, equipment, scientific instrumentation original equipment manufacturer's (OEM) representative's time and travel, materials and insurance costs to relocate the WSCF laboratory.

- **Communications & HLAN Costs**

Section 8.4, Information Systems of the ASMP establishes the criticality for Informations Systems, software and hardware, along with communications. However, the plan is unclear as to the costs of the necessary information systems if the commercialization of the WSCF and relocation to the CBC were to be pursued.

3.4 Legacy Costs

- **D&DCosts**

D&D costs of the WSCF are not considered. D&D will occur under both plans, to relocate or to maintain the current status of the WSCF. If commercialization occurs and the WSCF is then determined to be decontaminated and decommissioned, there will be a cost in the near term as opposed to later in the project's life cycle. If D&D is not accelerated, the costs of site surveillance and maintenance should be considered.

D&D costs for the total WSCF could range from $40 to $75/SF depending upon the agreed debris disposition. This is a ROM estimate range of $3 million to $6 million.

- **Surveillance and Maintenance of WSCF**

If D&D is not accelerated, the costs of site surveillance and maintenance should be considered.

3.5 Other Cost Considerations

- **Protection of Real Property**

According to initial conversations on the proposal, the facility would be fully commercialized. DOE Orders and regulations would not be applicable. The state would

be the regulating body. However safeguards and security, even the minimum standards as set forth in DOE M 470.4-1 (see Appendix B) are practical and common sense that would need to be considered for their cost impact to the proposal.

- **LEED Construction Cost**

LEED Gold Standards Requirements are a consideration for new construction. Cost impact to construction total project costs range from 5% to 15% of the total project cost. This would add $0.5 million to $1 million to the cost of construction.

4. READY TO SERVE (RTS) ANALYSIS

The following analysis was performed on the Ready to Serve (RTS) portion of the WSCF budget. The WSCF laboratory is funded through two budgetary components which are a Ready-to-Serve budget and the Usage Based budget. The Ready-to-Serve budget provides a base level of funding to allow the facility to operate to the DOE requirements of the Hanford Site, to provide funding for replacement equipment and facility upgrades.

The EMCBC looked at the costs of the Hanford Atomic Metals Trade Council (HAMTC) employees in the RTS and the viability of zeroing out these costs from the operating budget of the WSCF.

4.1 Determine the costs of HAMTC employees in the ready to serve WSCF budget.

After reviewing the Staffing Profiles that were provided by RJ Lee & RL, the cost of the HAMTC employees included in the RTS budget for WSCF was determined to be approximately **$1.4 - $1.5M (FY09$) per year**. The cost includes 12 Full Time Equivalents (12.4 FTEs). The labor groups included are Carpenters, Electricians, Millwrights, Painters, Plumbers & Pipefitters, Structural & Metal Works, Health Physics Technicians, Instrument Technicians, and Lab Technicians. The total cost for these labor groups consisted of 22,880 Regular Hours, and 2,912 Overtime Hours.

The labor rates used in the analysis included Regular and Overtime rates provided by Washington River Protections Solutions (WRPS) as part of their July 2009 proposal for American Reinvestment & Recovery Act (ARRA) work that is being conducted at the Hanford Site.

Appendix C includes a detailed break down the yearly WSCF labor costs (~$15M). The cost includes both the RTS (~$7.2M) and Usage Based (~$7.7M) costs. Included in the RTS cost is the HAMTC, Engineering Staff, and Other Professionals costs.

4.2 Determine the viability of zeroing out the Ready to Serve costs at WSCF.

The RTS cost each year for WSCF is approximately half of the WSCF budget. The costs include activities such as Facility Management (Operations, Maintenance, Engineering, and Radiation Groups), Client Services Organization, Production Control, Quality Assurance, and Business Systems. All of which are vital activities in the day to day operations of the laboratory, without which the lab could not function.

If the RTS budget were eliminated ("zeroed out"), WSCF would have to be able to account for the costs included in the RTS budget with funding from the Usage Base budget. In order for the laboratory to accomplish this, the sample analysis costs would likely need to double since the WSCF budget would be cut in half. This may prove problematic if other projects throughout the Hanford Site are unable to afford the higher sample analysis costs and begin shipping their samples to off-site laboratories for analysis. If WSCF is to remain operational at its current staffing level then the RTS budget needs to remain intact throughout the operation of the laboratory.

5. CONCLUSION

The Office of Cost Estimating and Analysis (OCE&A) supported an Interdisciplinary Project Team (IPT) from the Richland (RL) Operations Office, conducting a review of the ramifications of commercializing the Waste Sampling and Characterization Facility (WSCF) and moving operations to the RJ Lee Group at Columbia Basins College in Pasco, Washington. An Independent Review and Validation (IR&V) of the Analytical Services Master Plan (ASMP), under RL Contract No. DE-AC06-09RL14728 Site Services Contract was conducted. The OCE&A also contributed a Rough Order Magnitude (ROM) Transition Cost Estimate and other analysis as requested by the Site.

Based on the review and analysis of the ASMP's proposal for the Commercialization of the WSCF, the potential cost savings, as stated at $60 million over ten years could not be validated. The IR&V Team identified the need for additional investigation into other cost considerations that would have an impact on the potential for cost savings as presented in the ASMP.

The EMCBC OCE&A further recommends that RL proceed with responding to the proposal, pursuing a comprehensive, detailed cost estimate and supporting Basis of Estimate for the total project costs of the plan. Following this estimate, the potential for cost savings to the Richland Operations Office would be clarified and better understood to make a determination on the proposed plan.

APPENDIX A

Transition Costs

Transition costs to move from WSCF to RJ Lee should include:

1. Setting up a gas bottle storage area at RJ Lee.
2. Setting up a 90 Day storage pad at RJ Lee.
3. Setting up a sample archive storage area at RJ Lee.
4. Setting up and outfitting an administrative area (20,000 sq ft) at RJ Lee.
5. Retrofit the existing office space to lab space (5,000 sq ft) at RJ Lee. Outfit with lab furniture and required hoods. Hook up hoods to facilities.
6. Expand the lab into the future area (10,000 sq ft) at RJ Lee. Outfit with lab furniture and required hoods. Hook up hoods to facilities.
7. Move all WSCF analytical instrumentation from WSCF to RJ Lee. Hook up instrumentation to facilities. See attachment to Master Analytical Services Plan for list of equipment.
8. Run samples at both facilities where possible to ensure quality. (30K worth-Billy verify estimate).

APPENDIX B

DOE M 470.4-1, *Safeguards and Security Program Planning and Management*, Part 1, Section A, specifies that DOE offices and facilities must meet or exceed GSA minimum-security standards. This applies to both DOE-owned and DOE or DOE contractor-leased offices and facilities. In some cases, as specified by the DOE, the contractors have operational responsibility for offices and facilities for which the lease is directly between the DOE and the landlord.

The GSA minimum-security standards include four security Levels: I through IV. Only Levels I and II are summarized below because the relocation of the WSCF to the CBC would not dictate any Level III or IV facilities. Note that the primary discriminator between security levels is based on the number of people assigned to a facility.

Level I facilities, with 10 or fewer people (typically less than 2,500 square feet of office space), should include the following:

- Reserved government parking;
- Lighting for exterior parking areas, vehicle driveways, pedestrian walkways, and building perimeter;
- Entry door high-security locks;
- Prevention of public access to mechanical areas and building roofs;
- Prevention of unauthorized access to utility areas;
- Emergency power for critical systems (e.g., exterior lighting for safe evacuation, alarm systems, computer facilities);
- Restricted access to building information (e.g., plans for mechanical, electrical, fire, life safety systems);
- Occupancy-emergency plans;
- Posting of government rules and regulations at entrance (i.e., barring the unauthorized possession of firearms and dangerous weapons); and
- Upgrades to current life-safety standards (e.g., fire detection, fire suppression systems).

Level II facilities, with 11–150 people (typically 2,500–80,000 square feet) should include:

- Level I security standards;
- Shatter-resistant window protection for exterior windows; and
- Visitor control/screening system.

The evaluation and strategy for compliance with the applicable GSA minimum-security standards is documented in site-specific Security Evaluation and Strategy Checklists.

APPENDIX C

WSCF Labor Summary – RTS & Usage Base

RTS - UNION TOTAL	$	1,415,438
RTS - ENG STAFF TOTAL	$	1,016,205
RTS - OTHER PROFESSIONALS TOTAL	$	4,762,948
RTS - TOTAL	**$**	**7,194,591**
USAGE BASE - ALL STAFF TOTAL	**$**	**7,663,134**
WSCF LABOR COST TOTAL	**$**	**14,857,725**

WSCF Labor Detail – RTS & Usage Base

CODE	LABOR GROUP	LABOR RATE* REGULAR	LABOR RATE* OVERTIME	FTE's IN LAB	FTE's OUT LAB	HOURS REG	HOURS OT	COST REG	COST OT	TOTAL COST
RTS - UNION										
C010	Carpenters	$ 50.49	$ 64.58		0.6	1248	0	$ 63,012	$ -	$ 63,012
C020	Electricians	$ 55.14	$ 70.52	2.1		4160	208	$ 229,382	$ 14,668	$ 244,051
C060	Millwrights	$ 51.48	$ 65.84	1	0.4	2080	832	$ 107,078	$ 54,779	$ 161,857
C070	Painters	$ 51.00	$ 65.23		0.3	624	0	$ 31,824	$ -	$ 31,824
C080	Plumbers & Pipefitters	$ 51.62	$ 66.02	1.1		2080	208	$ 107,370	$ 13,732	$ 121,102
C090 (C120)	Structual & Metal Works (Other Crafts)	$ 51.48	$ 65.84		0.1	208	0	$ 10,708	$ -	$ 10,708
T050	Health Physics Technicians	$ 53.64	$ 68.60	2.1		4160	208	$ 223,142	$ 14,269	$ 237,411
T070	Instrument Technicians	$ 55.18	$ 70.57	1		2080	0	$ 114,774	$ -	$ 114,774
T080	Lab Technicians	$ 53.20	$ 67.81	3.7		6240	1456	$ 331,968	$ 98,731	$ 430,699
RTS - UNION TOTAL										$ 1,415,438
RTS - ENG STAFF										
E020	Civil Engineers	$ 72.60	$ 52.39	1		2080	0	$ 151,008	$ -	$ 151,008
E040	Electrical Engineers	$ 71.89	$ 51.88	2		4160	0	$ 299,062	$ -	$ 299,062
E070	Mechanical Engineers	$ 73.96	$ 53.37	3		6240	0	$ 461,510	$ -	$ 461,510
T020	Drafters	$ 50.30	$ 56.62	1		2080	0	$ 104,624	$ -	$ 104,624
RTS - ENG STAFF TOTAL										$ 1,016,205
RTS - OTHER PROFESSIONALS										
G020	Office Clerks	$ 29.24	$ 33.03	0.5		1040	0	$ 30,410	$ -	$ 30,410
G030	Office Clerks - Specialized	$ 44.71	$ 57.18	0.5		1040	0	$ 46,498	$ -	$ 46,498
G040	Secretaries	$ 32.47	$ 36.68	2		4160	0	$ 135,075	$ -	$ 135,075
M020	Managers & Executives	$ 95.05	$ 68.59	6	2.1	16640	208	$ 1,581,632	$ 14,267	$ 1,595,899
P030	Buyers/Procurement/Contracting	$ 56.91	$ 41.07		0.5	1040	0	$ 59,186	$ -	$ 59,186
P040	Commications Specialists	$ 63.27	$ 45.66	1		2080	0	$ 131,602	$ -	$ 131,602
P070	Planners & Schedulers	$ 65.11	$ 46.99	2		4160	0	$ 270,858	$ -	$ 270,858
P090	Industrial Hygienists	$ 69.49	$ 50.15	1		2080	0	$ 144,539	$ -	$ 144,539
P160	Editors & Tech Writers	$ 63.31	$ 45.69	1		2080	0	$ 131,685	$ -	$ 131,685
P170	Other Professionals	$ 64.90	$ 46.84	3		6240	0	$ 404,976	$ -	$ 404,976
S010	Chemists	$ 75.05	$ 54.16	5		10400	0	$ 780,520	$ -	$ 780,520
S020	Environmental Scientists	$ 67.46	$ 48.68	1.5		2080	1040	$ 140,317	$ 50,627	$ 190,944
P080	Health Physicists	$ 73.87	$ 53.31	1		2080	0	$ 153,650	$ -	$ 153,650
E100	Plant Engineer	$ 64.82	$ 46.78	4		8320	0	$ 539,302	$ -	$ 539,302
E110	Quality Control Engineer	$ 71.06	$ 51.28	1		2080	0	$ 147,805	$ -	$ 147,805
E120	Safety Engineer	$ 62.55	$ 45.14			0	0	$ -	$ -	$ -
RTS - OTHER PROFESSIONALS TOTAL										$ 4,762,948
USAGE BASE - ALL STAFF										
T050	Health Physics Technicians	$ 53.64	$ 68.60	3.1		6240	208	$ 334,714	$ 14,269	$ 348,982
T080	Lab Technicians	$ 53.20	$ 67.81	31.7		62400	3536	$ 3,319,680	$ 239,776	$ 3,559,456
M020	Managers & Executives	$ 95.05	$ 68.59	1		2080	0	$ 197,704	$ -	$ 197,704
P030	Buyers/Procurement/Contracting	$ 56.91	$ 41.07	0.5		1040	0	$ 59,186	$ -	$ 59,186
P070	Planners & Schedulers	$ 65.11	$ 46.99	0.5		1040	0	$ 67,714	$ -	$ 67,714
S010	Chemists	$ 75.05	$ 54.16	18.7		37440	1456	$ 2,809,872	$ 78,857	$ 2,888,729
S020	Environmental Scientists	$ 67.46	$ 48.68	2		4160	0	$ 280,634	$ -	$ 280,634
T030	Engineering Technicians	$ 46.47	$ 52.50	2		4160	0	$ 193,315	$ -	$ 193,315
E100	Plant Engineer	$ 64.82	$ 46.78	0.5		1040	0	$ 67,413	$ -	$ 67,413
USAGE BASE - ALL STAFF TOTAL										$ 7,663,134

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To: *Dr. Mark F. Marcus*
Manager, Hanford Analytical Services Program
From: *John E. "Jack" Farrell, III*
Subject: *Report of Concept Plan*
WSCF Commercial Comparability Study
Date: *February 23, 2001*

AEX was directed by HASP to conduct an independent and objective review of the systems, practices and procedures associated with the Waste Sampling and Characterization Facility (WSCF). This has been completed. Enclosed pleased find the report of observations and recommendations from this study. As requested, one hard-copy report and one electronic copy in PDF format are being provided.

The report consists of an Executive Summary, Introduction, Approach and Process Description, Observations and Recommendations. The bulk of the report discusses observations and practical recommendations based on the information provided and AEX Team experience. Included in the recommendations section are seven (7) immediate actions, which the AEX Team feels can be addressed readily by local management and can provide considerable relief and reduction in cost to DOE in the short term. The report also provides several key recommendation and role description for the DOE-RL in this matter. Further, a suggested rough model of cost allocations for a $4.8M laboratory has been included based on data from an industry-consulting study and the past experiences of the team members. This provides for a goal set for WSCF to strive for.

AEX is pleased to be of service to the DOE-RL and Fluor Hanford in this important matter. Jack, Barry and I want to thank you, your staff and the staff of WSCF for your hospitality, help and patience in accomplishing our task. Should you have any questions, please do not hesitate to contact me at our Altamonte Springs office.

Respectfully submitted,
Analytical Excellence, Inc.
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Waste Sampling and Characterization Facility (WSCF) Commercial Practices Concept Plan

Prepared for:

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*Misters Stephenson and Hall are associates of Analytical Excellence, Inc. (AEX) under confidential agreement to AEX in this matter. AEX is the independent contractor for the WSCF comparability Study to Fluor Hanford, Inc. under Contract Number 00009799.

PROLOGUE

Analytical Excellence, Inc. (AEX) was contracted by Fluor Hanford (FH) to develop a *Concept Work Plan* and execute the work plan under a constrained and limited time frame. As such, the authors of this study are well aware that the recommendations contained herein are not the product of an exhaustive study of the constraints that surround operation of the WSCF laboratory. In fact, constraints and conventional wisdom regarding operations at DOE-RL were largely ignored in order to allow a realistic comparison of WSCF operations to those of a commercial laboratory. The result is recommendations that are "Directionally correct" and based on available existing information and data, the expertise of the AEX Team members and specific past experiences of the Team in commercializing, re-engineering and operating high quality cost effective commercial entities.

The implementation of these recommendations requires the diligent efforts of those who live and work in the system daily. Implementation requires a re-thinking of objectives for WSCF and, most importantly, a commitment of all interested parties – DOE, Fluor Management, and the entire WSCF laboratory staff – to the objective of operating more efficiently and with a focus on client service. The authors do not intend in any way to minimize the challenges to implementing these recommendations. Culture and years of operation philosophy, bargaining unit consideration and effects of a fragmented organization with obviously diverse missions are formidable opponents. Each must be considered in light of potential impact. The authors have consciously chosen not to accept these as insurmountable obstacles and operate on the premise that these will be adjusted accordingly.

The reader is asked to ignore the sometimes-obvious lack of detail, and focus instead on the overall purpose of the study. The search for a way to implement suggested improvements is a far greater challenge than the discovery of a detail that was missed or the multiplicity of rules that make it difficult to change. The reader and implementation team are strongly encouraged to "*think out of the box*" in searching for effective implementation strategies. The change process must be a carefully guided, group effort. It may require input from resources outside the "system", since the changes required differ greatly from current operating procedures. It will certainly require "buy-in" and participation by operatives at all levels of management and at the bench level in the laboratory. We believe the rewards are worth the effort. WSCF's original purpose can be recognized, Hanford program objectives can be met, and those who accomplish the task will have set an example to be followed by other DOE offices.

Any questions or issues of clarity should be addressed to: Mr. Jack Farrell, Analytical Excellence, Inc., 812 Point Pleasant Place, Altamonte Springs, Florida 32701. Voice: 407.331.5040. E-mail: AEX@ix.netcom.com

Thank you for your consideration.

1. Executive Summary

Fluor Hanford (FH), as outlined in the DOE-RL correspondence 00-OSS-356, was tasked to conduct a commercial comparability study for the Waste Sampling and Characterization Facility (WSCF) located at the Hanford site. On January 14, 2001, Analytical Excellence, Inc. (AEX), a leading environmental laboratory-consulting firm, was engaged by FH to conduct an assessment of WSCF laboratory operation and to provide recommendations on moving the systems, practices and procedures more toward and in line with those of a commercial laboratory offering DOE the same or similar services. This effort was designed to make recommendations on increasing efficiency, removing obstacles to effective operation, increasing capacity and reducing costs. ***Recommendations on commercializing or privatizing of the WSCF or any other forms of divestiture by the DOE of the facility or operations were clearly outside the scope of this task order.***

AEX assembled a task team of three (3) experts in the environmental analytical chemistry industry to accomplish the objectives of the study in a timely manner. This team brings a combined wealth of overall experience of more than eighty-five (85) years as professional chemists and as well respected leaders of the environmental laboratory industry. Each team expert brings specific skills and depth of experience that directly impact the successful completion of this project. The information gathering aspects of this study included two trips to the Hanford site, and a briefing of key DOE-RL and Analytical Services (AS) persons to share the agreed upon work plan and progress.

During the performance of this comparability study the AEX Team reviewed background documents, correspondence, and reports to develop an understanding of the WSCF operation from an historical and operational point of view. The AEX Team conducted a series of interviews with all levels of laboratory staff, AS staff and the laboratory's four major clients. It is estimated that over 100 documents, correspondences, reports and records were reviewed and approximately 25 individual meetings and interviews were conducted with some individuals interviewed more than once. HASP was continually updated on the AEX Team's progress and observations. This report was delivered to HASP on February 23, 2001.

The expressed purpose of this effort is to provide a concept plan to conform the Waste Sampling and Characterization Facility (WSCF) to commercial practices. AEX is confident that it substantially accomplished the tasks and objectives outlined in the work plan for this project. This report suggests recommendations for all parties involved (the laboratory, AS, and DOE-RL) to enhance the contribution of WSCF. The Team received excellent cooperation from all parties contacted.

The bulk of this report is contained in the sections on Observations and Recommendations. *Observations* discusses a brief Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and those specific challenges to operate as a commercial laboratory. *Recommendations* are organized into five (5) categories: Immediate Actions, General Recommendations, Recommendations involving Limited Resources

Recommendations involving the Longer Term and Further Actions to Assure Sustainability.

The data supports a conclusion that WSCF is a mission critical operation. WSCF has an effective Quality Assurance system and a good solid technical reputation. WSCF has the ability to handle tough demanding projects and the potential to respond quickly to process demands. Its proximity on the Hanford site, while a deterrent to direct commercialization, minimizes the costs and operational delays associated with sending large numbers of samples off-site and outside of direct control of DOE. However, the Laboratory Information Management System (LIMS) is antiquated and does not effectively support automated laboratory operations or automated entry into client databases. Administrative and support systems, low efficiencies and labor utilization, and incongruent customer services practices severely limit WSCF's ability to accomplish its mission cost effectively.

The report identifies seven (7) actions items that can provide immediate relief with no additional staff or capital investment but with substantial savings. These involve waste handling, simplifying CAM, capitalizing on DOE-TRU capacity needs, simplifying work planning, eliminating the use of the Standards preparation group and rationalizing the use of shared resources with 222-S. This report contains a proposed '*Environmental Analytical Laboratory Model*' for consideration contained in exhibit D. This model discusses a potential cost structure for operations based on a recent industry study and the Team's past experiences. The model postulates cost allocations for a $4.8M laboratory, a size comparable to the workload of WSCF. Further, the data collected indicates a number of significant opportunities for improvement that can decrease overall cost to DOE, increase service to programs and increase the overall value of WSCF to the Hanford site. This is actually good news, because it provides a rich environment to reduce costs to DOE and yet increase value to Hanford programs at the same time.

Based on the information provided, it is estimated that the FY 2001 costs are higher than those of a commercial laboratory offering the same or similar services. This is largely due to the infrastructure of WSCF, low utilization and low efficiency. The largest gains, overall, can be made by:

- Streamlining the support services and operating environment (i.e. Corrective Action Management)
- Changing the focus of management and staff more toward emphasis on managing the generation of high quality cost effective analytical data to allow programs to make cost effective and timely decisions regarding processes and clean-up operations,
- Fostering and strengthening customer relations and service,
- Eliminating the current WSCF LIMS in favor of an updated flexible "PC" based system, and maximizing utilization of strengths (i.e. process control support, problem solving and process knowledge).

The role of DOE-RL in this effort and in the implementation of these recommendations is crucial to success. There are areas and policies that are perceived to be out of the direct control of WSCF management and AS. These predominantly involve the interpretation of DOE-RL directives, WDOE issues, HNF Pros and procurement policies. In order to realize benefits similar to commercial operations:

- The DOE-RL needs to clarify directives, adjust requirements based on the actual risk, and encourage alternatives.
- DOE-RL needs to help contractors clarify the requirements and reinforce the idea of a graded response to directives and requirements at the WSCF as well as strongly encouraging a more simplified operating environment.
- DOE-RL and its contractors need to embrace "practical remedies", dramatic process change and proactive actions by responsible management to streamline support processes. Things like routine maintenance, or routine procurements should be able to be handled in the same manner as in the commercial laboratory industry.
- DOE-RL needs to provide timely response to questions on re-engineering of policies and alternatives.
- DOE-RL needs to provide an open mechanism to engage regulators in discussions of proposed alternatives and gain solutions that assure compliance with lower cost and streamlined processes.

It is important for all parties to understand and accept that commercial laboratories performing hazardous and radiochemistry analysis on radioactive samples do operate in a safe and compliant manner with effective safety, corrective action and waste handling procedures but with less burden on the laboratory. WSCF needs to strive to mimic the cost allocations of commercial laboratories while providing superior service and quality.

The role of AS and WSCF is first to develop a "change management" and customer service philosophy from the grassroots of the organization, facilitated by management. WSCF and AS should then proceed with the implementation while working with the DOE-RL on solution driven strategies. The goal being to assure all practical recommendations are fulfilled and a continuous improvement process implemented for future sustainability of a re-defined WSCF mission.

2. Introduction

As a part of the Fluor Hanford (FH) contract with the U.S. Department of Energy, Richland Operations (DOE-RL), the Analytical Services group (AS) was tasked to conduct a commercial comparability study for the Waste Sampling and Characterization Facility (WSCF). In October 2000, Mr. Jack Farrell, President of Analytical Excellence, Inc. (AEX), a leading environmental laboratory-consulting firm, was contacted by Dr. Mark F. Marcus, Manager, Hanford Analytical Services Program (HASP) to determine interest and qualifications to conduct this study. A request for proposal was responded to by AEX in December 2000. On January 14, 2001, AEX was engaged by FH to conduct an assessment of the WSCF and to provide recommendations on moving the systems, practices and procedures of the WSCF more toward and in line with those of a commercial laboratory offering DOE the same or similar services. This effort was designed to make recommendations on increasing efficiency, removing obstacles to effective operation, increasing capacity and reducing costs. ***Recommendations on commercializing or privatizing of the WSCF or any other forms of divestiture by the DOE of the facility or operations were clearly outside the scope of this study.***

The expressed purpose of this effort is to provide a concept plan to conform the Waste Sampling and Characterization Facility (WSCF) to commercial practices. This plan suggests recommendations for all parties involved (the laboratory, AS, and DOE-RL) to enhance the contribution of WSCF. The U.S. Department of Energy, Richland Operations Office (DOE-RL) requirements for the study were outlined in the DOE-RL correspondence 00-OSS-356 to Fluor Hanford (FH) as excerpted below:

> *"...As part of the FY2001 effort, FHI is also requested to submit a plan.... For achieving comparability of WSCF to commercial laboratories, defining actions needed on the part of DOE and contractors. Commercial comparability means to come as close as possible in total cost to DOE for a given scope of work (service) conducted at WSCF as through a commercial contract. Comparability includes sustainability i.e. the ability to continue the cost and benefit over the long term ....."*

The objectives of the Concept Work Plan can be characterized into two major tasks:

- Identify and suggest changes in WSCF operational and management practices by evaluating operating procedures, cost of operations, quality practices, customer services, and identifying actions required to maintain a sustainable service and any WSCF "value added" benefits.
- Link recommendations (where possible) and suggest the responsible party for implementation of specific actions by DOE and its contractors.

This effort was assigned a finite time frame for completion and, as such, it was necessary to clearly defining the scope and boundaries of this task for AEX to achieve the objectives and deliver a meaningful report on schedule by February 23, 2001. In carrying out this study the following key focus areas and limitations of scope were maintained.

- A clear focus on the laboratory operations and the WSCF laboratory facility as opposed to the entire WSCF Complex with all its attachments. Separate out where possible the WSCF operation from other laboratory operations, i.e. 222-S.
- A commitment to provide practical and concrete recommendations to reduce the total cost to DOE.
- A focus on recommendations based on the AEX Team's expertise and experience, using available data for both WSCF and the commercial industry as opposed to creating new studies and performing detailed analyses.
- A commitment to use available data, and interviews with the staff and WSCF clients to support the observations and recommendations by the AEX Team.
- A clear focus on identifying action items for laboratory management, DOE, and Fluor to increase the success, usefulness and cost competitiveness of WSCF.

A copy of the AS approved Concept Work Plan for this effort is attached and identified as Exhibit A.

AEX assembled a task team of three (3) experts in the environmental analytical chemistry industry to accomplish the objectives of the study in a timely manner. These industry experts are Mr. John E. "Jack" Farrell, III, President of AEX, Mr. Jack R. Hall, Principal Interpretive Consulting and Mr. Barry A. Stephenson, President of MCLinc. Each team member's credentials are attached and identified as Exhibit B.

This team brings a combined overall experience of 85 years as professional chemists and as well respected leaders of the environmental laboratory industry. The specific skills and depth of experience offered by this team directly impact the successful completion of this project. Some of these include:

- Laboratory and business management,
- Commercialization of a former DOE laboratory,
- Operation of commercial radiochemical and mixed waste laboratories,
- Due-diligence of laboratory operations for acquisition,
- Technical expertise in the laboratory quality assurance and analytical procedures,
- Laboratory and regulatory Quality Systems and data integrity audits,
- Re-engineering of laboratory operations and implementation of "best practices" programs,
- Revenue generation and customer service practices and organization, and
- Analytical project management of commercial and government projects including DOE, and establishing and managing customer service programs.

The information gathering aspects of this study included two trips to the Hanford site. The first trip, January 14, 2001 through January 18, 2001, included a project kick-off meeting with HASP management, a meeting with the DOE Program Manager, Ms. Elizabeth Bowers, a tour of the facility, discussions with WSCF laboratory management and the collection of documentation. The purpose of this effort was to gain an overall perspective of the operation and to gather a sense of where to apply further AEX

resources. Based on this trip a defined work plan was established and approved. The second trip was conducted on January 28, 2001 through February 2, 2001. The purpose was to continue the interview process and seek answers to questions developed from the earlier interviews and review of the documentation.

Further, on January 31, 2001, a briefing was held with DOE-RL, AS, and the AEX Team. The expressed purpose of this briefing was to share the approach and concept plan, provide an interim status report and most importantly to gather insights from the participants. In attendance were DOE representatives Mr. Wade Ballard, Mr. Randy Krekel, Mr. Robert Rosselli and Mr. Mike Schlender along with Dr. Mark Marcus and Mr. Duane Renberger from AS and the authors of this report. A copy of the briefing presentation is attached and identified as Exhibit C. Additional data gathering activities were conducted by follow up telephone conversations to address any subsequent questions or fill any information gaps.

During the performance of this comparability study the AEX Team reviewed background documents, correspondence, and reports to develop an understanding of the WSCF operation from an historical and operational point of view. The AEX Team conducted a series of interviews with all levels of laboratory staff, AS staff and the lab's four major clients. It is estimated that over 100 documents, correspondences, reports and records were reviewed by the AEX Team and approximately 25 individual meetings and interviews were conducted with some individuals interviewed more than once. HASP was continually updated on the AEX Team's progress and observations.

This report was prepared based on the information gathered and provided, and is designed for consideration by management. This report consists of a number of sections, which describe various aspects of the process, observations and findings. Recommendations are divided into five Sections: Immediate Action Items; General Recommendations: Actions Involving Limited Resources; Actions Involving the Longer Term and Further Actions to Assure Sustainability.

2.1 Background of WSCF

Hanford's Waste Sampling and Characterization Facility (WSCF) was constructed to provide an on-site resource for the analysis of low-level radioactive and non-radioactive samples. The 40,000 square foot facility was completed in 1995 and equipped with then state-of-the-art analytical instrumentation. The staff of WSCF consists of approximately ninety (90) FTEs in current FY (2001). Of these full time equivalents, forty-two (42) FTEs are estimated to actually be involved with the generation of analytical data, reports and customer service. The facility was budgeted in FY2001 for $5,587,000 in direct or base DOE-RL funding and $5,742,000 in reimbursable costs from programs (pool monies).

The facility and instrumentation were designed to perform analyses for radionuclides, organics, metals, classical inorganics, asbestos, and industrial hygiene parameters on solid, liquid, and gas samples. The intent was for WSCF to serve Hanford effluent

treatment facilities, industrial hygiene programs, programs requiring RCRA, CERCLA[1], or TSCA compliance monitoring, and other Hanford programs requiring low detection limits and/or quick turnaround times.

WSCF's on-site location and ability to dedicate capacity to site needs made it the logical laboratory to serve all site needs for low-level analyses. Over time, a number of program needs have been satisfied by analyses being conducted in off-site laboratories. Drivers for these decisions to send samples to laboratories other than WSCF have varied – cost, ability to meet turnaround time, reporting requirements, and type of analysis. Additionally, the laboratory staff has dealt with recurrent efforts to decide whether the laboratory capability will be maintained or commercialized or closed. As a result, the laboratory's current mission, which surely differs from its original mission, may not be clearly understood by the interested parties – DOE, Fluor Management, potential clients and the laboratory staff.

The decision that initiated this current study is an important first step in the re-definition of that mission. The decision is that WSCF should operate as a "commercially comparable core laboratory for process support, with incentives to drive sustainable customer focus and cost effectiveness".

The message to the employees who comprise the ninety (90) full time equivalents required to operate WSCF is that operation is to continue, but changes are required. These changes are directed toward operating more nearly like a commercial laboratory. The process of change is one for which little previous experience has equipped the majority of laboratory staff and one which is complicated by the fact that the industry which WSCF is being asked to mimic is itself in a state of continuing adjustment. Nonetheless, the intent is improved efficiency and sustainable customer focus. The goals can be accomplished; the level of success will be directly related to efforts on the part of DOE, Fluor management, and the laboratory staff. This study will provide some direction regarding the objectives of this change process.

2.2 Value Added Benefits to WSCF

The WSCF laboratory's benefit to the Hanford site lies in its on-site location, its ability to commit dedicated capacity to site support, and the technical knowledge of site processes. For a variety of reasons, this potential has not been fully recognized and the facility is currently under-utilized.

WSCF has a proven track record in providing rapid turnaround process support for the Liquid Waste Processing Facility (LWPF). Another example of process support is the analysis of extracts from 222-S for organic constituents. This provides the desired analyses from a WDOE accredited laboratory without the necessity for transporting a radioactive sample offsite. These capabilities should be strengthened and applied to additional on-site process monitoring needs.

[1] The scope to conduct CERCLA analyses was eliminated during WSCF construction.

Compliance monitoring support is provided by WSCF in the radiological analysis of stack filters and room air filters. Analyses that support liquid effluent disposal are also considered compliance monitoring. Dedicated support can insure the deadlines are met and technical knowledge of processes can be utilized to spot the need for confirmatory analyses prior to release of the report. In emergency response situations like the fire last year, the WSCF laboratory has demonstrated the capability to provide a broad base of analytical support in a timely manner.

Capacity is available in the WSCF facility, but only if the staff can be focused in a culture that drives Quality and productivity rather than countless other distractions. WSCF management must understand that commercial chemical/radiochemical laboratories do operate safely, maintain corrective action programs, and maintain good waste handling practices while operating with fewer support staff. WSCF laboratory management must be determined to meet the requirements while seeking a graded approach to procedures, but not adding another layer of unnecessary activity that is pulling the lab from it's mission.

WSCF's client service staff offers process knowledge and historical information which can be valuable to Hanford programs. This "value-added" feature can be utilized to attract additional on-site customers. The laboratory must be able to deliver the service before such an advantage is fully recognized.

As one can see the WSCF facility does have strengths and "value added" benefits which are not being fully utilized for various reasons and these "challenges" are described in later sections.

3. Approach and Process Description

In conducting these types of assessments, it is important to look at the organization, WSCF in this case, differently; eliminating all present paradigms regarding the operation of this facility. A good way to do this is to visualize this facility in completely different circumstances. For the purposes of this study only and as a 'tool' to focus outside the given paradigms, the AEX Team began to think of the WSCF in one or more of the following ways:

- *If you inherited the WSCF from a relative and needed to immediately turn a profit ... what would you do? And what would you change?*
- *If you could take the WSCF laboratory, building and all, and move it just outside the Hanford reservation fence ... What would you need to operate efficiently?*
- *Given that the laboratory handles very low to no activity samples, if we placed a glass umbrella over the complex... What streamlining of the operating environment could be done?*

- *Further, in any business development effort, it is essential to start with a "kernel" of service that is important to customers, do it efficiently and with superior service...build other cost effective services around these core competencies...and do those efficiently and with superior services. In this manner, you achieve differentiation and superior return to stakeholders.*

These paradigm shifts and basic tenets were used to maintain focus on the larger aspects of the objectives and to challenge each piece of information or "rule" encountered for applicability in a commercial laboratory and to compare the practices to those of a commercial laboratory. Separate models based on these tenet have not been prepared, however, the thinking that went into the AEX Team's recommendations is based on all of them.

Each of AEX's associates brings a specific skill set and expertise to the information gathering and analysis process. The approach was to split the various assessment tasks, document review and interview process into sections for one or more of the AEX Team to handle. For example, Mr. Hall was responsible for the majority of the in-depth operations and laboratory quality system review, Mr. Stephenson and Mr. Farrell for cost structure analysis, customer service, etc. In this manner, a number of parallel tracts could be followed. Because of the overlap in skill sets, issues can be addressed from multiple fronts. This provides a measure of checks and balance to the information received by the AEX Team also providing increased objectivity and confirmation.

The Concept Work Plan was designed to accomplish the objectives by performing the following tasks:

- Review background documents and develop an awareness of the history and current mission of the facility,
- Review approach and consider input from Analytical Services and DOE staff,
- Assess current laboratory operations through observation and detailed interviews with all levels of laboratory and support staff,
- Evaluate the information gathered versus their internal drivers and the corresponding approaches used by similar commercial laboratories. and
- Discuss the performance of the laboratory with key clients to understand if their needs are being meet.

During the performance of this comparability study the AEX Team reviewed background documents, correspondence. and reports to develop an understanding of the WSCF operation from an historical and operational point of view. The AEX Team then developed a concept work plan to assess the laboratory through a series of interviews with the FH management, laboratory management, laboratory staff at all levels and functions, and WSCF client representatives that deal directly with the laboratory. The AEX Team conducted extensive interviews of over twenty-five (25) individuals with respect to their function covering the parameters listed below, including DOE-RL, laboratory management, the Bargaining Unit representative, chemists. engineers, etc.

Some individuals were interviewed more than once. Further, the AEX Team reviewed well over 100 documents including correspondences, reports and records.

The study is very similar to other activities that the AEX Team members have participated. The following list of parameters were considered in this study. Additionally, any influences outside of WSCF control that may have affected these parameters were also considered.

Organization	Communications
Work Habits	Staffing
Customer Service	LIMS
Equipment	Batching
Facility	H&S requirements
Workflow	Sample Complexity
QA systems/QC requirements	Clients
Method Diversity	Costs

3.1 Organization of Report

The AEX Team has focused this report on the objectives outlined above. Each observation or recommendation can be supported by documentation or interview notes or by team experience. Where appropriate, some of this material is included with this report. The report is divided into multiple sections. Each section describes what was done, analysis of data and recommendations. The major sections of the report are listed below.

- Executive Summary
- Introduction
- Approach and Process Description
- Observations
- Recommendations

3.2 List of Individual and Organizations Contacted

During the two on-site visits the AEX Team met with the following individuals or organization representatives:

Department of Energy – Richland

Elizabeth M. Bowers – Project/Program Manager, Office of Site Services
W. Wade Ballard – Assistant Manager for Planning and Integration
Randall N. Krekel – Nuclear Engineer, Office of Site Services
Michael H. Schlender – Deputy Manager for Site Transition
Robert M. Rosselli – Deputy Manager for Business Services
Ed D. MacAlister – Environmental Engineer, Operations Oversight Division

Analytical Services

Duane L. Renberger – Vice President, Analytical Services

Mark F. Marcus – Manager, Hanford Analytical Services Program
James B. Giesa – ISMS
Eugene F. Mares – Lead, Project Controls and Budget
Lajuana Deere – Project Controls
Russ Bisping – Lead, Science and Quality Assurance
Don White – Quality Assurance
Mike Barnes – Quality Assurance
Karl Pool – Client Services
Curtis Stroup – Client Services
John Trechter – Client Services

WSCF Laboratory
Don Hardy – Acting Project Manager
Jennifer Nuzum – Acting Manager, Operations
Dan Thornton – Acting Lead, Facility Operations
Scott Fitzgerald – Manager, Analytical Services
Bill Baird – Lead, Inorganic Chemistry and Rad Chemistry
Stacey Bolling – Inorganic Chemistry/ Industrial Hygiene
Brian Parsons – Radiological Control
Troy Dale – Lead. Project Support
Tom Bushaw – Project Support
Mark Kastl – Bargaining Unit Representative
Brent Porter – Generator Services

WSCF Customers and Potential Customers
Paul Crane – TRU Program (WIPP)
Larry P. Diediker – Manager, Monitoring and Reporting,
Fluor Hanford Environmental Services
Joan H. Kessner – Manager, Analytical Services Program
Bechtel Hanford, Inc.
Phil Olson – Project Engineer, Liquid Waste Processing Facility
Fluor Hanford Environmental Services

3.3 Major Documentation & Records Reviewed

As part of the effort to develop a better understanding of the WSCF history, operation, costs and supporting programs and procedures, the AEX Team reviewed many documents with the key ones listed below:

- Quality Assurance Plan - Waste Sampling and Characterization Facility HNF-SD-CP-QAPP-017 Revision 4 September 2000.
- Waste Sampling and Characterization Facility - Path Forward Study Attachment 2, June 24, 1999
- Waste Sampling and Characterization Facility Customer Satisfaction Survey October 2000.

- Fluor Hanford Analytical Services Programs and Functional Support Charters ASP-100 Section 4.3 Revision 1 June 12, 2000.
- Waste Sampling and Characterization Facility for the Environmental Compliance Program - Statement of Work, HNF-EP-0836-6, Revision 0 June 27, 2000.
- Fluor Hanford Contingency Risk Analysis-Multi-Year Work Plan PLG-1329, 2000.
- Waste Sampling and Characterization Facility - Goals, Capabilities, and QA Program HNF-SD-WM-QAPP-036
- Waste Sampling and Characterization Facility Site Management Board-Decision Summary, May 1, 2000
- Implementation of Waste Sampling and Characterization Facility Decision DE-AC06-96RL13200
- DOE-Rating of Value Added Services January 16, 2001
- Waste Sampling and Characterization Facility Sample Analysis Workload January 2000-2001
- Analytical Laboratory Costs DOE-RL/CCC, EM-36, August 29,1995.
- Reports from LABCORE LIMS Access Database from November 2000 to January 2001.
- WSCF Commercial Comparability Study Financial Information- 01/23/01
- Corrective Action Management –HNF-PRO-052, Revision 6 –11/15/2000

4.0 Observations

This section is intended to discuss the data obtained in relation to some standard industry benchmarking processes. This section is organized into a SWOT analysis and challenges to operations. This information is used as a foundation for understanding the operation of WSCF, how it is compared to commercial organizations and where to focus resources. It is not an exhaustive study but a well thought out "quick and concise" synthesis of the facts and variables. A majority, but not all, recommendations are based on the information below.

4.1 WSCF Strengths, Weaknesses, Opportunities and Threats (SWOT)

A SWOT analysis is a useful tool for understanding an organization's character and can be critical in helping to identify organizations core competencies. One of the key tasks for this comparability study was to ascertain specific factors about the WSCF and determine into what category of business attributes that factor should be classified. The four categories are defined as follows:

- Strength - a positive factor setting that laboratory apart from others. Something that is key to future operation, that WSCF does particularly well and/or is a niche service
- Weakness - a shortcoming that will limit growth and/or eventually foster problems
- Opportunity - item that, if addressed, can lead to growth or a potential business area open to the organization

- Threat - items that stand as barriers to current business or preclude growth

In reviewing the WSCF operations certain elements essential or related to laboratory operations were identified and placed in one of the categories (see Table 1). An explanation of the items is also presented below. Recommendations for actions addressing key issues are presented in subsequent sections of this report.

Table 1 WSCF Strengths, Weaknesses, Opportunities, and Threats

Strengths	Weaknesses	Opportunities	Threats
Staff Experience	LIMS System	Acquire new clients to increase workload	Small Client Base
WIPP Approval	Management Focus	Cross-training	WIPP goes away
Technical Reputation	CAM Complexity & resource drain	Available capacity in the facility	Waste Handling Costs
Good BU Relationship	Customer service; Client relations and client perceptions	Reduce support staff/costs through complexity reduction	New Pricing System
Excellent Safety Record	Low Efficiency	WIPP work from other DOE sites	Conservative Implementation and Interpretation of DOE/contractor Directives or Procedures
Staff appears open to change	Lack of Performance Metrics Data	QA Program	
QA Systems	Excess support staff	Productivity/Cost Monitoring	
Proximity	Old instrumentation		
Process experience of technical staff	Procurement system		
Technical problem solving	Cost management		

4.1.1 Strengths

The Staff Experience, Safety Record, BU Relationship and Technical Reputation are all good: Unfortunately these attributes will not ensure success since they are expected in any viable commercial laboratory. How they are used to differentiate service levels and increase customer loyalty are the keys to success.

WIPP Approval: A key WSCF strength is the WIPP approval. This process took about a year to complete, has tough requirements, is hard to obtain and is in short term demand. This can be a valuable opportunity, because apparently no commercial competition exists and there is a high cost to market entry.

Desire to Change: A second key strength is the willingness and in some cases *desire on part of the staff to change.* Change is absolutely necessary for WSCF to survive.

Effective QA Systems: The third key strength is having an effective *QA System* in place. Neither AEX Team client interviews nor the customer surveys identified Quality as an issue and the last client survey did have clients mentioning the high quality of WSCF. This is critical because quality as an issue could be considered a fatal flaw and very hard to overcome in a close client community like Hanford. Improvement of Quality, however, is also an opportunity in that the plan needs to be changed to reflect actual practices. Efforts should be made to make Quality a real overall client positive.

Proximity: The WSCF facility is ideally located to achieve ready access to on-site analytical work and convenient for the client to interface with the laboratory. Cost and logistics of having to send samples off-site to commercial laboratories are minimized by use of an on-site facility.

Technical Experience/Problem Solving: The WSCF staff has considerable experience in analytical chemistry and radiochemistry and have shown on several occasions their ability to solve difficult sampling and analysis problems in support of both on-site processing plants and site cleaning activities.

4.1.2 Weaknesses

LIMS System: The staff and clients all agree on the *limitations of the LIMS* system, including its inability to upload data, batching, excess user time required, and inability of user to develop queries. A LIMS system focused on WSCF customer and operation needs that is user friendly and automates routine clerical tasks significantly decreases errors, saves labor, uses technical resources more effectively and shortens turn-around-time to customers.

Management Focus: This refers to the Laboratory Management focus on operational compliance as if WSCF is a "nuclear processing" facility. This approach to operations, taking a very conservative interpretation to DOE and FH requirements and not looking for ways to work effectively within the system, in actuality adds to the burden with more meetings, paperwork, etc. It appears that management is rewarded on operational compliance, not necessarily the generation of high quality cost effective data to meet client expectations. An example of this is the *Corrective Action Management Program complexity.* Laboratory management should be spending time on issues affecting the generation of laboratory analysis data and reports (product), on customer service, efficiency, and capitalizing on new market opportunities.

Customer Service: *Customer service, client relations and client perceptions* constitute a major area of concern in the commercial industry, but has not been recognized as part of the culture at WSCF from the top down. It appears that WSCF considers this handled by the HASP –Client Services and not of significant importance to the laboratory staff and

management. Clients want to deal as directly with the laboratory as possible and thus a triangular communications loop develops that is ineffective. The client. customer service and laboratory interface must be in real-time and as transparent to the client as possible. The customer service person must be seen by the client (program manager) and the laboratory staff as the "client's advocate" and as a positive 'value added' service.

It should also be recognized that there is an apparent discrepancy between the data gathered from customer surveys, essentially positive reviews, and the information that was provided to the AEX Team by customers, potential customers and client service personnel. This discrepancy maybe due to the "silent majority" of customers not responding to the surveys. This needs to be looked into and rationalized for cause.
Customer service, as along with Quality and Safety, must be the basic tenets of culture for all laboratory personnel. Laboratory personnel must understand and embrace the idea that meeting or exceeding the customer's needs and expectations is key to success for WSCF.

Inefficient Operation Practices: *Low efficiency* was noted in reviewing the data from the Access database reports. Staff strives to meet holding time and then slowly moves through the review process at a pace driven by the client due date. This approach can cause the appearance of an in-house backlog even in the slowest of work periods. Studies in other organizations have shown that the actual "analysis time" for routine analytical testing is between five (5) to seven (7) days. The remaining component of turn-around-times is queue time or wait time.

Performance Metrics for Data Generation: *Lack of data on key performance indicators* (group TAT, capacity available, and throughput by method, analyst and instrument) means the Laboratory Manager and the Group Leads have little idea of their capacity, critical path points, etc.. Hence the ability to meet specific short-term turn around commitments and make commitments on new projects is lost.

Excess Support Staff: This is evident from the organization chart versus a commercial mixed waste lab. A commercial laboratory of 59 would have 10-12 management and support staff maximum, including 3 project managers. The WSCF organization chart alone shows at least 22 support staff plus the project support staff from HASP and accounting data reflects an even larger number.

Instrumentation: Many of the *WSCF instruments are at least 5 plus years old* and not equipped with the latest technology, electronics, auto-samplers, and computers available. Instruments are able to meet current low workload but a critical shortcoming with increased workload or current priority projects. There are definitely production and TAT gains to be had by upgrading instrumentation.

Procurement: The *procurement system* appears to have become entangled in a process to avoid counterfeit parts and defining quality each time for each item. Counterfeit items are not a laboratory industry problem and the quality of lab materials is well defined and consistent for 99% of items purchased by the laboratory.

Cost Management: This does not appear to be a driver within the lab at the group level and the availability of "real time" cost data that a commercial laboratory uses is just not there. Emphasis is on comparing costs to budget and evaluating client spend rate to date. Commercial laboratory management focuses on a greater understanding of costs on a daily basis.

4.1.3 Opportunities

A number of the weaknesses observed in the previous section can be turned into real opportunities for gain and cost reduction. These are explored in detail in the recommendations sections of this report. Additionally, there are a number of opportunities in training, cost and complexity reduction, increased capacity, etc..

Missed Opportunities: In talking to customers there are *several missed opportunities* where work is going off-site based not only on prior practices, but issues attributed to WSCF's performance. This makes identifying and correcting the weak points critical to getting new work. Client involvement is key to this process. Trying to push for additional new work without corrective actions first will lead again to failure. This corrective action can be done on a graduated approach for select parameters/sample types.

Cross-training and Identifying Available Capacity in the Facility: These go hand in hand as a means to increase capacity quickly with little additional costs. This is a key to increasing the ability to handle future workload changes in the short term.

Reducing Costs through Complexity Reduction: This is both a short and long term process, but necessary for immediate costs reductions. A good short-term example would be reorganizing the work planning in the engineering area eliminating the detailed planning of routine items and saving the costs to hire the additional planning person currently requested. A long- term example is fixing procurement of routine quality items.

WIPP Work: The need for drum gas characterization prior to *WIPP disposal* exists across the DOE sites and opportunities may be available at sites like Rocky Flats where need exceeds capacity. This is an immediate opportunity to be pursued by WSCF.

QA Program: The QA plan for WSCF needs to be rewritten to address what the laboratory is really doing in some areas i.e. seven replicates not three for MDL's and the data review section rewritten to define the two levels of review that are occurring. Also the reporting limits on the WSCF reports are not the EQLs as required per the QA Plan, but MDLs. From a DQO process it is very risky to report at the MDL and just flag the result as an estimated number. Clients do not understand what this means and when entered into databases the flag is often lost. A client also noted some reports were not flagged at the MDL.

Productivity/ Cost Monitoring: This is a valuable set of tools not available to management now on a "real time" basis to allow WSCF to have the data on a daily basis as commercial laboratories do. This data is key to making and keeping commitments to clients on HT and TAT, as well as controlling costs for future sustainability.

4.1.4 Threats

Threats are critical challenges that could lead to business failure. They must be managed in the context of opportunities and not just accepted as costs or manners of doing business.

Small number of Clients: A very apparent threat to WSCF is the small number of samples based on HASP estimates. Three programs provide approximately 80% of the samples analyzed by WSCF. The client program support staff needs to work with the lab while the laboratory starts the efficiency correction process to expand laboratory capacity and then "sell" their services to Hanford Programs.

Waste Disposal: The *costs of waste disposal* at nearly a $400,000/year is hard to understand but is exacerbated by a practice of twice-daily collection of wastes at each point of generation throughout the laboratory. A practice forced on 222-S, but passed on by the state WDOE to WSCF. It appears, based on conversations with WSCF management, that this practice came from a WSCF proactive response to a WDOE issue with the 222-S laboratory.

New Funding Allocation System: During the interviews a few people mentioned the *changing pricing approach* where clients will be prorated lab costs on a annual fee basis. No one was knowledgeable yet how this would be done, but all expressed concern that both clients and the laboratory would suffer from such a change. The lab in not being able to charge for extra work requirements and clients in that they would pay too much, even if their sample load went down.

Conservative Interpretation of DOE Directives and Contractor Procedures: This approach can only cause costs to spiral upward. In some cases there are in-house generated procedures that ignore the real role of the laboratory versus the directive and produce requirements that are not necessary for a laboratory like WSCF.

This SWOT analysis identified a number of key issues that form the basis for the recommendations in later sections.

4.2 Challenges to Operation of WSCF as a Commercial Laboratory

The challenges to operation that WSCF must overcome are divided here into two categories; (1) peripheral systems that in the commercial world are in place to help the laboratory operation but in WSCF's case are not providing that support and (2) WSCF internally driven systems that are bogged down in a "people and paper" bureaucracy.

4.2.1 Peripheral Systems

A Hanford Site Culture: A perception (culture) across almost all levels at WSCF, and an underlying theme, is that DOE Richland is an unquestionable authority requiring all operations to be interpreted the same under all directives and procedures. Whereas the directives and philosophy of the written orders, the impressions given by the FACREP and DOE-RL representatives tend to focus more on a graded approach based on risk. However, perception is reality and there appears to be a miscommunication. Part of this is due indirectly to the approach of the FEB assessments which treat WSCF, a low-level lab, and 222-S, a high level lab, the same.

Procurement System: The purpose of this study was not to learn or understand this system but discussion with the WSCF staff made it very clear that it is not a helpful system. General impressions and anecdotal information related to the AEX Team, revealed that the system is flawed. It was reported that it can take months to get new items and standards which, when finally received, are near expiration or of limited value because of exposure to adverse temperature condition. Commercial labs are moving to consignment buying with an on-site single vendor charged with providing 90% of laboratory needs. Next day delivery is a worst-case norm.

Accounting System: The accounting system is not structured to collect cost data at the laboratory analysis group level. This becomes important if the matter of controlling cost is to be addressed by laboratory management. Typically, commercial laboratories are managed to metrics that emphasize quality, production, and cost control (specifically labor utilization). The laboratory management needs "real time" costs data to watch and control costs by group and line item with particular attention to controllable costs items like: overtime labor, materials and supplies, maintenance, utilities and travel. Reviewing the information received from AS, the data does not appear to be broken out that way or available on a "real time" basis.

Financial data supplied by the Analytical Services Project Controls group was reorganized by the AEX Team for comparison to commercial laboratories doing government sponsored work. It was possible to extract financial data and extrapolate, with limited confidence, information that gives insight into overhead rates at the WSCF facility level. Calculations are based, in general, on Cost Accounting Standards (CAS) set forth in the Federal Acquisition Regulations (FAR). All costs presented by the Project Controls Group were assumed to be "allowable" as defined by the FAR. Total costs were reorganized by the AEX Team into three groups:

- Direct labor expense pool which includes all costs other than those specifically identified as administrative expense and direct labor cost
- Direct labor cost is defined as the analytical payroll (35 FTE's) for the WSCF laboratory. Total cost includes salaries, wages, and benefits. Also included in direct cost is $50,000 in commercial laboratory agreements for subcontract analyses. Direct labor cost plus subcontract costs constitutes the allocation basis for the direct labor overhead calculation.

- General and administrative costs include items identified as corporate tax, financial management, staff training (administrative), and administrative supplies. Total cost input for the general and administrative overhead calculation includes direct labor plus direct labor overhead.

Details of the overhead calculations are presented in Table 2 and Table 3. While some refinements are certainly possible, the numbers are sufficiently accurate to support the following observations:

- Direct labor overhead with all costs considered (202%) is more than twice the direct labor overhead which is considered reasonable by most commercial laboratories.
- Facility costs, which total almost $4 Million and involve 34 employees, are the most extreme deviation from costs normally incurred by commercial laboratories. It should be noted that the facilities costs are overstated by an estimated 20 to 25% due to space provided to outside groups for no charge. Since this cost cannot be recovered by WSCF, it is regarded as a WSCF expense for calculation purposes.
- Direct labor overhead calculated without facility costs (87%) is within the acceptable range for commercial laboratories
- Laboratory labor was regarded as 100% direct labor for purposes of the calculation since the accounting system does not track direct labor versus indirect labor for individuals
- Direct labor costs of $97,666 per laboratory employee is considered above market for commercial laboratories by a factor of two

- General and administrative overhead is within range for either the calculation with facility costs or without facility costs, however, costs of sales which are included in commercial laboratory G&A do not appear in WSCF costs. In reviewing Table 2 it appears a portion of the $583,887 for Client Services could be apportioned to costs of sales, since that group is performing functions like quoting, contract negotiations and set-up that fall under cost of sales on the commercial side.

Removal of all facility costs from the overhead calculation is an oversimplification, however, the facility costs for WSCF are so far above those encountered by a commercial laboratory that the point is well illustrated by their elimination from the overhead rate calculation. In actuality if commercial comparability is to be accomplished, the expense adjustments should involve reductions in many categories to bring them more nearly in line with the laboratory model, attached and identified as Exhibit D.

TABLE 2 DIRECT LABOR OVERHEAD - FY2001

EXPENSE CATEGORY	AMOUNT S	FTE's
Analytical Instruments:		
Maintenance	36.965	0.4
Calibration	40,000	
Service Agreements	115.000	
Analytical Materials	345.000	
Standards	131,295	1.6
Analytical Data	138.578	1.4
Analytical PE/QC (Accreditation)	168,345*	0.3
Waste Handling/Disposal	380.358*	2.5
Radiological Support	473.006*	3.6
Client Services	572.209*	5.2
Regulatory Compliance/Quality Control	490.315*	4.6
Facility:		
Maintenance	1,176.799	10.6
Operations	2,098.875	19.6
Engineering	712,464	4.2
Staff Training (analytical)	120.000	0.6
Total Expense Pool (A)	6.999.209	54.6
Allocation Base:		
Direct Labor + Com. Lab. Agreements (B)	3,468,299	35.0
Labor Overhead Rate (A) / (B)	202%	
Adjusted Expense Pool w/o Facility (A')	3,011.071	
Adjusted Overhead Rate (A') / (B)	87%	

* 2% of total cost attributed to administrative supplies.

TABLE 3 GENERAL AND ADMINISTRATIVE OVERHEAD - FY 2001

EXPENSE CATEGORY	AMOUNT S	FTE's
Corporate Tax (G&A)	931.987	
Financial Management	25.278	0.3
Staff Training (Administrative)	106.292	0.5
Administrative Supplies	42,535	
Total Pool (C)	1,106.012	
Total Cost Input (D)	10,467.508	
G&A Rate (C) / (D)	10.6%	
Adjusted Cost Input w/o Facility Costs (D')	6,479.370	
Adjusted G&A Rate (C / (D')	17.1%	

Safety Program: The ISMS program recently put in place is an opportunity for WSCF to implement an effective safety program and yet not create the burden of another high maintenance system. The AEX Team is concerned that implementation as it appears to be proceeding will lead to another meeting/paper driven system. Employee involvement is critical, but there are better more technology driven ways to accomplish this goal.

Facility Evaluation Board (FEB): The AS project is assessed annually which leads to a 30 page plus report of recommendations, unfortunately treating 222-S and WSCF as the same project. According to the laboratory staff this leads to considerable amount of time being wasted on what applies to which lab and when there is a doubt or conflict the recommendation is adapted for both.

Excess Waste Control Costs: The laboratory instituted a policy requiring all wastes be picked up twice per day in each lab. This practice was a proactive response by WSCF in response to the WDOE requirements at 222-S. It is strongly suggested that WSCF must work with DOE legal to convince the WDOE that WSCF is similar to other commercial laboratories in its waste generation and should be treated as such. WSCF is not a "nuclear processing facility" with high activity waste streams.

4.2.2 Internal Systems

Maintenance System: Routine maintenance and necessary equipment repair is continually tied up in a paper driven process with no attempt to separate the simple routine from the real complex. Work requests and work planning becomes bogged down. An anecdotal example shared by the laboratory centers on a 6-8 month process to move a gas cylinder holder into the lab due to a required location change of a GC instrument. This example was discussed with the DOE Facility Representative, Ed MacAlister. He freely expressed his belief that the WSCF makes the process too complicated for routine maintenance and he would approve standardized abbreviated procedures for the routine tasks. However, the culture fosters the "one way for everything" approach. No one is considering the "safety/risk" issues of these delays. A second anecdotal example presented to the AEX Team centers on maintenance of an analytical instrument that is not meeting performance requirements. Apparently, the operator has to bring in an instrument technician to work on the problem, the operator is not permitted to fix instruments. If the instrument technician cannot resolve the problem, the instrument repair vendor is called. The instrument technician must be present for the instrument repair engineer to work on any instrumentation. This is an extra person involved compared to commercial operation where the vendor is involved right away if the analyst cannot fix the problem.

Complex Corrective Action Management (CAM): System of processing corrective actions is well beyond what is practical for a laboratory. It is well beyond the minimum requirements of FH PRO 052. For example, all deficiencies are risk rated, discussed and resolved at weekly meetings with 12 or more staff and support commonly in attendance. These meetings last 2-3 hours. A recent meeting conducted while the AEX Team was on-site lasted three hours and discussed three DEGS, two of which were risk rated "0"

and one risk rated "1". None were closed out. FH PRO 052 gives the Lab Manager a lot of authority and flexibility which should be exercised. The CAM runs with a backlog of approximately thirty deficiencies all from internal sources. Only 1-2 deficiencies were from clients in the last six months. Based on these data, one has to question the focus of the system.

Client Service System: From the client prospective the laboratory is not user friendly and responsive especially on new projects and requests (i.e. limited sense of urgency to phone request for information; or lack of flexibility to change or adjust services to meet client needs). An anecdotal example was related in this manner: A client calls the HASP client service person, who is not able to answer the client's question. Client service then tries to contact a technical individual in the lab, who is busy and doesn't get back to client service in a timely manner. The client gets frustrated on waiting and calls the laboratory directly circumventing the system and leaving an undocumented communication trail and client service group out of the loop.

Radiological Control System: A fully staffed Radcon group (3 people) shared with 222-S is apparently used by WSCF for only about 20% of their time according to Rad-Con staff. Category 3 and 4 activity level samples are a minimum at WSCF. Most of the time and effort is spent maintaining rad survey equipment and doing surveillances of WSCF facility. In a commercial environment the analysts do their own monitoring and wipe sampling as part of their jobs under direction of the part-time facility Radiological Safety Officer. This is an approved NRC approach.

Waste Control System: As noted above, the practices of twice daily waste collection must be addressed. Also, lab staff are spending a great deal of time on evaluating ways and requirements for disposal of standards, reagents, and spent samples. This is well beyond practices in a commercial laboratory waste management. Laboratory permits usually contain categories such as flammable solvent, non-flammable solvents, low-level rad aqueous; low level rad solid; mixed waste solid and liquid, acid liquid, base liquid and general lab aqueous. All waste for a lab area go into the appropriate container based on knowledge of the generator without an extensive risk evaluation effort, MSDS review, and compatibility testing. WSCF appears to be taking an ultra-conservative approach that may be applicable in other operations such as 222-S, but not a low-level chemical/radiochemical laboratory such as WSCF.

Procedure Change Process: The WSCF operating procedure change process is really burdensome and time consuming requiring review and sign off by safety, QA, Radcon, engineering and client services before the revised procedure goes to management for final approval. The QA person had many of these on his desk in various stages of approval. This is unacceptable. If there is a need for a change action should be taken quickly and documented according to a documents control procedure. QA should control to whom it is routed based on the type of change. One to two days, not weeks, for processing should be the norm.

5. Recommendations

This section describes the observations and recommendations identified by the AEX Team's activities. It is largely based on observation of how commercial laboratory operations handle the same requirements, restraints, inefficiencies and challenges. Based on the AEX Team's limited review and information provided and heavily on the AEX Team's experience with commercial laboratories and the regulatory environment, the following items are suggested for consideration, evaluation, and change. Clearly, the biggest gains are available by changing the operating environment for WSCF, with significant opportunities to save DOE base cost funding. It should be noted that the AEX Team's approach here was not to provide an exhaustive and endless number of recommendations for consideration, but to focus on key areas and processes that could yield substantial returns, and to categorize these based on difficulty and resources needed.

Recommendations fall into several categories;

- ***Immediate Actions***: Those actions that can be taken relatively easily with no real human or capital investment. Implementation of these actions should yield benefits immediately.
- ***General Recommendations***: Those actions that will require an implementation plan and time to complete. These are usually larger program involving the "soft" components of management such as "culture change"
- ***Recommendations involving Limited Resources***: These action are usually those involving the use of limited capital resources as opposed to addition of human resources. These typically involve process change and re-engineering.
- ***Recommendations involving the Longer Term:*** These actions are large complicated projects that may take several months to a year to complete. These may also involve either changing "rules" or working with regulators to change the laboratory' status.
- ***Further Actions to Assure Sustainability:*** These are actions necessary to make sure WSCF continues to sustain a presence in a cost effective manner.

The role of DOE-RL in this effort and in the implementation of these recommendations is crucial to success.

The perception that the WSCF and others have regarding change opportunities is that the current conservative approach by management is carrying out DOE-RL's wishes of "absolutely no-risk" ,real or perceived. This is one key factor that in the AEX Team's opinion fosters the ultra-conservative interpretations of requirements.

Based on the information gathered and anecdotal examples provided by interviewees, the AEX Team feels strongly that this is a least partially attributable to the results and audit approach of the FEB and its scoring ramifications, the focus of DOE-RL on contractor operation compliance, and on the mechanisms for contractor performance rewards. Each of these are important processes and procedures for "nuclear processing operations" with the potential risks associated with processing significantly hazardous and radioactive

materials. However, the extent that the WSCF is expected to operate on the same level as these processing operations and evaluated as such, is severely hindering cost- effective generation of high quality analytical data to support compliance and operations. The DOE-RLs need to clarify directives, adjust requirements based on the actual risk, and encourage alternatives. DOE-RL needs to help contractors clarify the requirements and reinforce the idea of a graded response to directives and requirements at the WSCF as well as strongly encouraging a more simplified operating environment. At the very least, DOE-RL and contractors need to reinforce "practical remedies," process change and proactive actions by responsible management to streamline support processes. Routine maintenance, or routine procurements should be handled in the same manner as in the commercial laboratory industry. Where appropriate, specific recommendations that should include DOE involvement are presented below.

5.1 Immediate Actions

The AEX Team has identified several action items that can and should be taken immediately by the laboratory management. Each of these changes can reduce the cost of operation to DOE and/ or increase service to DOE and its contractors with very little to no additional risk. Some of these actions provide for small gains while other provide substantial gains for WSCF.

5.1.1 Waste Control - Eliminate the afternoon pick-up of spent waste solvents from the laboratories to the common holding area.

The laboratory currently removes 'spent waste' solvents from each individual laboratory twice daily. Since this practice is apparently self-imposed and not a direct WDOE directive, WSCF should reduce the practice to pick up once daily. This is a short term solution and handling of spent solvents should be dramatically simplified over the longer term based on receiving relief from WDOE as described below in Section 4.1.4 **(Action by WSCF).**

5.1.2 Rationalize the use of shared resources between WSCF and 222-S.

The December 11, 2000, WSCF organization chart shows a Standards Lab with a number of personnel who are shared with 222-S. Calibration standards and QC standards are currently available in mixes from vendors for most of the analytes covered by WSCF tests. The practice of dedicating this work to standard preparation chemists for WSCF appears to be redundant and wasteful. Eliminate the process and institute a policy of purchasing already prepared certified stock solutions, WSCF chemist will make their own working standards according to standard traceable practices. If warranted, contract 222-S services on a "piecemeal" basis for special standards.

Further, evaluate all shared positions with 222-S for value-added benefit to WSCF. If value is minimal, such as the Standards Preparation issue above, personnel should be reassigned to 222-S. (This consists of 16 people on the 12/11/00 organization chart.). Another area that can be simplified centers on the use of "Rad-Con". This was discussed

earlier in Section 4.3.1 and a source of potential additional savings **(Action by WSCF and AS).**

5.1.3 Simplify Corrective Action Management (CAM) as Implemented at WSCF

An effective corrective action process is critical to the success of a Quality System and the WSCF. The CAM process used by the WSCF is clearly overkill compared to commercial laboratories. FH PRO 052 governs the CAM process and provides for a graded response. The WSCF has interpreted the requirements very conservatively and implements a one-tier process rather than a graded process. Apparently, Every DEG goes through the same detailed process whether it is risk rated "0" or risk rated "5".

Eliminate the layers of process and obstacles to swift completion of corrective action.

- Change the risk rating assignment process from the current group assignment to a minimal team of laboratory manager, facility manager, Quality assurance officer, and laboratory operation manager. This activity should take no longer than 30 minutes weekly.

- Handle all risk rated issues of "0","1", and "2" on a local management level without going through the full DEG process. Use a simple one-page corrective action form and assign the corrective action to the appropriate responsible party for resolution. Provide access to all final solutions on an electronic bulletin board.

- Price Anderson and FACREP functions related to low risk rated DEGs can be handled through a quarterly audit process.

It is estimated that these immediate and allowable changes to the CAM process can free hundreds of hours of analyst, supervisor and management time. For example, the AEX Team witnessed a DEG meeting that lasted over three hours with about 12 attendees to discuss (not close) three (3) DEGs, two of which were risk rated "0" and one that was risk rated "1". Most of the DEGs at WSCF are risk rated "0" and "1" **(Action by WSCF)**

5.1.4 Capture the Maximum Available WIPP work from other DOE sites.

Using DOE-RL and Hanford WIPP project manager, contact the other DOE sites with high WIPP workloads, such as Rocky Flats, to start the process of adding WIPP samples by handling overflow. Realize, it may take several months of diligent effort to get sample flow moving, quick response now will help sites understand capacity is available within DOE system. This must be conducted concurrently with laboratory operations changes to ensure that an increased workload can be handled **(Action by AS and DOE).**

5.1.5 Simplify Work Planning Process

As noted above in Section 4 the work planning process can be simplified by reducing the paperwork, review and approval process for routine maintenance. The goal would be to avoid hiring the additional planner needed to meet current process demands **(Action by WSCF).**

5.1.6 Rethink the HASP Support Assigned to WSCF

The direct overhead costs in Table 2 show costs and FTEs for Client Services (5.2 FTEs) and Regulatory Compliance/Quality Control (4.6 FTEs). The AEX Team was told these represent the costs of the HASP Client Services, and the Science and QA groups. The 5.2 FTEs for the current projected WSCF workload is significant by more than the 3.0 FTEs required for a commercial laboratory dealing with a large client base. The 4.6 FTEs for Regulatory Compliance/Quality Control is approximately 50% of the HASP group and the AEX Team questions why does the 222-S not require more of that effort. Function and role of each group must be evaluated and costs distributed appropriately to the lab needs. **(Action by WSCF and AS)**

5.1.7 Consistently Define WSCF Cost and Resources Assigned

Cost information given to the AEX Team shows 34.4 FTE's assigned to WSCF facility maintenance, operations, and engineering. The WSCF laboratory organization chart dated December 11, 2000 shows 20 FTE's plus one vacant position for these functions. A similar disparity exists in the definition of total costs. Cost data provided indicate 90 FTE's while the organization chart identifies 59. In order to manage costs for WSCF, the number of personnel and budgeted costs should match. **(Action by WSCF and AS)**

5.2. General Overall Recommendations

Recommendations in this section are broken into specific business and service aspects for clarity.

5.2.1 Management

Evaluate and consider changing the laboratory management's focus and operating philosophy.

5.2.1.1 A client stated that the WSCF laboratory is getting more like 222-S, which requires by virtue of the types of samples it analyzes, more intense safety and risk related procedures similar to "process" units. This observation is supported by the AEX Team who felt that, in many ways, the lab was being run like a nuclear facility operation. *A clear change is suggested in where management places its emphasis.* For the laboratory to be successful, cost effective and provide superior service to clients, the majority of effort must be focused on managing the analytical process and generation of high quality data to support cost effective decision-making and site operations. Support areas, such as

facility operations, are not to be the center of attention but viewed should be in relation to what is the best way to support the analytical generation of data. **(Action by AS and DOE).**

5.2.1.2 The DOE-RL should request the Facility Evaluation Board to assess the 222-S laboratory and WSCF separately with separate reports based on their different missions. The FEB should evaluate WSCF on specific procedures as a laboratory handling very low or no activity samples for trace analysis, and not necessarily on a standardized interpretation of site rules. An alternative would be to substitute for an external third party laboratory assessment group the FEB evaluation as discussed below. This assessment could handle all quality, safety and appropriate safety/risk related items as well. **(Action by DOE).**

5.2.1.3 Rewrite the QA Plan for WSCF and have a detailed third party external assessment against the plan to make sure all systems are addressed **(Action by AS and WSCF).**

5.2.1.4 This study was by design of limited duration and funding. Because of this, the AEX Team was not able to do an exhaustive review of every DOE-RL directive, WDOE or Ecology audit or requirement or FH policy. As a parallel effort, HASP should complete that review, as it relates to suggested changes and issues. A small concise "decision" team of no more than 5 representatives consisting of an empowered DOE-RL representative, AS representative, WSCF laboratory management, and Quality Assurance, should be charged with this task. Any review should be based on the mission of the facility and on developing a graded approach to implementation of the procedures without sacrificing safety, and increasing risk or decreasing data quality **(Action by AS and DOE).**

5.2.1.5 Metrics are effective tools to help focus staff and managers on client drivers and value added processes. A set of metrics can not only identify problems early on, but also provide feedback on how corrective action processes are working. Consider developing Key Result Indicator (KRIs) that are laboratory operation wide (i.e. On-time delivery to client commitment) and flow-down Performance Indicators (PIs) that are department or analytical technique specific (i.e. cycle time by department) that are necessary and roll up into the KRIs. The measures need to be performed by the departments to foster ownership and displayed for all to see. Success will be achieved as staff begins to address production issues and corrective actions in terms of the metrics and benefits. Some suggestions might include: **(Action by WSCF).**

- Turn Around Time and causes for delays
- Batch-Size: monitor and set goals by group
- Workload versus capacity by group
- Costs per group and per analysis
- Response time to customer calls

A strong set of practical metrics can be the foundation for continuous improvement and help management monitor what is actually occurring and where stumbling blocks in the operation occur. This effort can help to fuel future improvements.

5.2.1.6 Consider implementing a system of cost management that is looking on a "real time" basis at performance and costs metrics. The cost management system must supply information on a sufficiently detailed level to provide information on what tests cost versus price and why the differences and expenditures at the group level. (Actions by FH and WSCF)

5.2.1.7 Commercial laboratory organizations look differently at costs. A brief review of a recent industry study by a leading environmental business management consultant identifies a number of areas that commercial laboratories focus. These performance indicators, taken from the Miller and McConnaghy Study (Table D-1). should be incorporated in the evaluation of WSCF operations:

- Direct labor approximately 42-45% of sample revenue
- Cost to produce the product approximately 55-60% of sample revenue
- Disposable supply costs 11-15% of sample revenue
- Revenue/FTE (fully loaded)measure of $90,000-$110,000 per FTE

The Team has put together a rough cost allocation model based on the above performance data and the past experiences of team member. WSCF should strive to approach this model. Changes in operating environment, process, focus and products will greatly assist WSCF in achieving these cost allocation goals. **(Action by AS and WSCF).**

5.2.1.8 WSCF QA Lead must be a strong QA person with commercial lab experience **(Action by WSCF).**

5.2.1.9 There are too many meetings and they last too long. Consider evaluate meetings in terms of importance to the laboratory mission and bring the number of participants, duration and facilitation under control. Use more electronic communication, if possible. For example: DEG meetings should be limited to the minimum number of people required in the procedure and to one hour maximum. To assure ISMS and employee participation, post results of meeting and DEGs on a shared bulletin board. **(Action by WSCF).**

5.2.1.10 There appear to be a number of negative "rumors" in the user community in regards to WSCF. These center on WSCF's capabilities, DOE mandates and future of WSCF. Some actually represent a series of untruths. In just talking with a few clients the following statements were made:

- WSCF does not have capabilities nor do they want to do soil analyses. WSCF does have soil capabilities.
- The laboratory cannot do CERCLA work because of a regulatory requirement it must be sent out.

- WSCF is closing next Fiscal Year.

Perception is reality. These types of unchecked rumors just make the job harder. Consider the following actions:

- Distribute a press type release of the recommendations and actions from this report. **(Action by AS).**
- Make a final decision on the future and mission for WSCF **(Action by DOE).**
- Allow HASP and the laboratory to proactively conduct training and even market WSCF services to perspective clients centering on how WSCF works and capabilities. **(Action by DOE)**
- Periodic progress development reports on WSCFs actions toward moving to move commercial practices and cost structures. **(Action by AS)**

5.2.1.11 The entire waste handling process within WSCF needs to be re-engineered and streamlined.

- Consider initiating discussions and interfacing with WDOE on what are the real alternatives to handling the wastes in an analytical laboratory where samples and wastes contain low to no activity. How can the RCRA and NRC rules apply?
- Consider reviewing ALL waste related internal procedures versus the way commercial labs perform. **(Action by AS and DOE).**

5.2.1.12 Evaluate the organization of the WSCF laboratory in regards to laboratory management, support groups and client services, as well as, shared resources noted above and implement a reorganization based on the analytical industry model (see Exhibit D). Consider adding an Operations Manager or Lab Manager with strong analytical industry background. **(Action by AS and DOE).**

5.2.2 Customer Services and Revenue Generation

5.2.2.1 Evaluate sample workload being sent off-site especially CERCLA type samples. Set up processes that will provide these services in 21 days or less routinely including delivery of full reports to client. **(Action by WSCF).**

5.2.2.2 Identify KEY Core Competencies matched to site needs, and identify needs for these competencies at other DOE sites, and then strengthen. Drop methods/procedures without sample workload support or take action to charge client the higher costs associated with that rare analysis. For example, ICP/MS analyses site-wide, who is buying or needing these services today, versus future. Now evaluate workload versus ability to get the work projected versus capacity to perform, and then strengthen weak areas **(Action by WSCF).**

5.2.2.3 Rethink the planned change in approach to WSCF funding or cost recovery and it's impact on the laboratory and the customer. The AEX Team's impression was that this change was not client or laboratory friendly, admittedly not understood by either. Also, flat fee funding does not foster cost efficiently and service. **(Action by AS and DOE).**

5.2.2.4 Foster a culture at the bench emphasizing customer service and highlighting the importance of meeting/exceeding customer needs. Each member of the WSCF staff must understand that without loyal and satisfied customers, there are no samples for analysis and no reason for WSCF. This is accomplished by training, understanding of mission and values, costs and client requirements **(Actions by WSCF).**

5.2.2.5 Client services personnel must view their role as a client advocate and not just a contract manager or enforcer. The laboratory must recognize the need to respond to client service personnel as quickly as if they were direct clients, because they represent direct clients. **(Action by WSCF).**

5.2.2.6 Review the customer service survey for those clients that did not respond to the survey. The general "rule of thumb" is that at least 50% of those not responding have a negative response, but do not act upon it. This is important to resolve the apparent discrepancy between the AEX information and the survey results. **(Action by WSCF).**

5.2.2.7 After implementing the immediate recommendations, prepare a presentation for potential and current on-site clients to let them know the changes being made and the benefits it will provide and solicit comments for further changes. **(Action by WSCF).**

5.2.3 Personnel Issues and Utilization

5.2.3.1 Current philosophy is that we are okay if we are meeting HT and TAT. The consequence is that samples are not processed through the lab efficiently. Change the working motto to "reduce backlog". Based on the daily receipts seen during the Team's visit, TAT should be less than 5 days **(Action by WSCF).**

5.2.3.2 Move customer service and contract generation into the lab. This way the entire organization is focusing on client needs. This can also help to reduce miscommunications and cycle times. Customer service becomes an integral part of the product generation. **(Action by AS).**

5.2.3.3 Cross train individuals in analysis, instrument repair, sample receiving and Rad-Con. This provides for increased coverage and off-loading of tasks during peak times. This can also reduce the dependence on external contractors. It can also foster a culture of work cells. **(Action by WSCF and AS).**

5.2.3.4 Strengthen the work assignment and batching process, traditionally called Production, Planning and Control in manufacturing, to assure that batch size is maximized. Provide a feedback mechanism to verify. De-skill the work assignment process. The developer of the Access Database used for work assignments is now performing the function of "data base clerk. This is a waste of technical resources. **(Action by WSCF and AS).**

5.2.3.5 Match tasks to skill level. Analysts and operator functions should be de-skilled as practical to free chemist for review and development tasks. **(Action by WSCF).**

5.2.3.6 Eliminate external offices for laboratory management and analytical staff including analysts, technical staff, QA and project management to allow efficient communication and problem resolution. Commercial laboratories maintain staff in the laboratory very effectively (separate offices/cubicles are not necessary). **(Action by WSCF).**

5.2.4 Process Change and Development

5.2.4.1 Determine what databases current and potential clients are using and evaluate ability to interface with current WSCF system. Clients want data added directly and automatically to their databases **(Action by WSCF).**

5.2.4.2 Provide more flexible client sample receipt hours. Two clients mentioned availability of the laboratory to receive samples as a problem on off days and long weekends and after hours **(Action by WSCF).**

5.2.4.3 Since bar code readers are available in the laboratory; WSCF should provide bar code containers to all clients. When received back into the laboratory, samples should be tracked using bar codes to reduce manual input into the LIMS **(Action by WSCF).**

5.2.4.4 Focus on utilizing ICP/MS for all work, with few exceptions. Gain approvals from clients and WDOE. **(Action by AS and DOE).**

5.2.4.5 As mentioned earlier, studies have shown that actual cycle time for analytical and reporting processes are 5 to 7 calendar days. Consider implementing a program of process mapping to eliminate non-value added steps in the production process. Focus on high volume analysis areas, such as the radiochemistry area. **(Action by AS and WSCF).**

5.2.4.6 Consider utilizing high performance work teams, commonly called 'work cell organizations'. These team structures are extremely efficient and highly responsive to client needs. For teams to be successful, several criteria should be met specifically a stream of high volume and predictable samples for a consistent "vanilla" set of analysis under the same analysis and delivery conditions i.e. WIPP TRU. **(Action by AS and WSCF).**

5.2.5 Training

5.2.5.1 Provide professional laboratory customer service training to ALL staff. **(Action by AS and WSCF).**

5.2.5.2 Implement cross training plan. All analyses must have 2 or more analysts trained to perform key analysis and reporting function. **(Action by WSCF).**

5.2.5.3 Provide change management training for all management and "why changes are needed" training for all staff involved in the process. This must be treated as a positive process leading toward an increase in work not a decrease in analytical jobs **(Action by AS and WSCF).**

5.2.6 Simplification

5.2.6.1 The procurement system must be addressed immediately. The laboratory should be able to control their supply lines. Evaluate best approach - based alternatives available to analytical industry. Also prices charged to WSCF appear higher than commercial vendor contract prices. **(Action by WSCF, FH and DOE)**

5.2.6.2 Eliminate spending time on CAM/DEG items rated 0, which are put in facility system and tracked. Just log those items, take action or go on. Get the CAM/DEG system under control-screen out low impact items and keep meetings to a defined focused discussion covering all new ones in an hour with only those personnel absolutely necessary involved. Achieve by setting agenda times and enforce. None of the proposed is contrary to Fluor Hanford PRO 052 Corrective Action Management procedure. **(Action by WSCF and AS).**

5.3 Recommendations Involving Limited Investments

5.3.1 Evaluate ASAP LIMS alternatives - Compare the LABCORE system with new PC based systems that are very effective for this type and size lab. Current system lacks batching flexibility, ability to run custom queries by users, unable to have more than one set of QC criteria thus not able to handle client specific criteria. This does not meet demand of clients for project related DQOs; so lab monitors manually. Overall the LIMS doesn't provide data to operate a lab efficientlyFund a new system selection process for a new LIMS system to serve only WSCF, leading to purchase and installation of new LIMS in FY02. Tom Bushaw should head up the selection Team that would gather input on needs from the users and the clients **(Action by WSCF, AS and DOE).**

5.3.2 Reevaluate current capital plan to replace ASAP any equipment whose operating efficiency is less than 75% and critical to a current workload or does not meet reporting limits required by client for regulatory reporting. Other needs should be addressed separately as noted below **(Action by WSCF, AS and DOE).**

5.4 Recommendations Involving Longer Term or More Investments

5.4.1 Add new instrumentation justified based on a real need not just because instruments are old. The need shall be determined based on workload and new plus old client forecasts with enough redundancy to meet five day TAT for all work **(Action by AS and DOE).**

5.4.2 If the search for new work and clients is successful, there may be a need to add /set-up other or new technologies to provide the identical services **(Action by AS and DOE).**

5.4.3 Evaluate infrastructure systems that may need replacement to avoid down time i.e. HVAC system **(Action by AS and DOE).**

5.5 Further Actions to Assure Sustainability

5.5.1 Incentivize WSCF staff with a reward system based on costs savings and productivity while maintaining Quality and increasing customer service. **(Action by AS and DOE).**

5.5.2 #1 The 222-S workload should be evaluated to make certain that 222-S is not processing samples that meet WSCF's mission and would be more efficiently analyzed at WSCF. **(Action by AS and DOE).**

5.5.2 #2 Another approach to be evaluated is to make WSCF an intermediate rad level laboratory. This would become an option if WSCF cannot reduce some of the requirements inappropriate for a low level lab. **(Action by AS and DOE).**

5.5.4 Long-term workload is critical to WSCF sustainability. If the work is available, WSCF must develop the reputation of a client oriented service laboratory with a skilled staff producing quality data at a defined cost in a time frame more competitive than sending off site. Related to this is the cost of the analyses provided by WSCF and how clients will pay for it. DOE should rethink or further define the proposed change in pricing or cost recovery, because rumors make it appear as a negative for WSCF in the eyes of the client. **(Action by DOE).**

5.5.3 The Hanford site appears to have a number of analytical laboratories that support processes and operations. Develop a plan to build clients based on future site projects to avoid building new laboratories with same capabilities. This plan should be proactive toward meeting client needs and a primary goal is to develop within the DOE community nationwide a reputation that WSCF is a model cost-effective laboratory. **(Action by WSCF, AS and DOE).**

Respectfully Submitted on February 23, 2001 by:

John E. Farrell, III
President, Analytical Excellence, Inc.

Barry A. Stephenson, President
Materials and Chemistry Laboratory, Inc.

Jack R. Hall, Principal
Interpretive Consulting

Exhibit A
CONCEPT WORK PLAN

Analytical Excellence, Inc.

Research -- Analysis -- Training -- Consulting

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A Concept Plan to Conform WSCF to Commercial Practices

Briefly described below is the outline of a project plan. The concept plan suggests recommendations to enhance the contribution of the WSCF laboratory by moving the operational procedures and standards, cost structure and overhead, service performance and quality toward those comparable with the commercial environmental laboratory industry. The goal is to identify ways to reduce the total cost of the WSCF operation while maintaining its core competency and strengthening its excellence of service.

The DOE-RL requirements were outlined in the DOE-RL correspondence 00-OSS-356 to Fluor Hanford, Inc. as excerpted below:

... As part of the FY2001 effort, FHI is also requested to submit a plan ... for achieving comparability of WSCF to commercial laboratories, defining actions needed on the part of DOE and contractors. Commercial comparability means to come as close as possible in total cost to DOE for a given scope of work (service) conducted at WSCF as through a commercial contract. Comparability includes sustainability i.e. the ability to continue the cost and benefit over the long term. ...

A team of three (3) experienced environmental laboratory chemists and managers has been assembled to accomplish the objectives and tasks for this project. The team members collectively have over 85 years of technical, managerial and customer expertise in the field of environmental analysis and the operation of laboratories including hazardous and radioactive sample matrices. AEX has been charged to complete the project plan and deliver its recommendations by February 23, 2001.

1 Objectives

Develop a plan that identifies and suggests changes in operation and management practices which differentiate WSCF from commercial laboratories providing similar services. This comparative analysis must address cost of operations, quality practices, customer service, actions required to maintain a sustainable service and any WSCF "value-added" benefits.

Recommendations on changes to move the WSCF toward systems, practices and procedures comparable to commercial laboratories will be included in the final report. Emphasis is placed on actions DOE can undertake to construct a sustainable operating environment to foster WSCF as a high quality cost competitive operation.

Key Focus Areas and Limitation of Scope

A. Focus on the Laboratory Operation and Facility as opposed to the entire WSCF Complex with all its attachments.
B. Focus on practical and concrete recommendations to reduce the total cost to DOE.
C. Focus on recommendations based on the Team's expertise and experience and available data for both WSCF and the commercial industry as opposed to creating new studies and performing detailed analysis.
D. Use available data to support the observations and recommendations of the Team.
E. Identify action items for laboratory management, DOE, and Fluor to increase the success, usefulness and cost competitiveness of WSCF.
F. This program will not focus on plans or actions to divest, privatize or commercialize the WSCF operation.

II. Work Elements to be accomplished

A. Scoping Activities
1. Meet with Fluor Hanford Analytical Services and DOE-RL to conceptualize scope for the project.
2. Conduct initial interviews to identify resources available for use in completing the project.
3. Develop an outline, which defines objectives, work elements, and schedule for the project.

B. Review Historical Information
1. Privatization and related studies
2. Cost Modeling
3. Sample Projections
4. Instrument capital plans
5. Regulatory requirements and DOE orders
6. Financial Performance

C. Assess Current Laboratory Operations
1. Issues keeping the WSCF from approaching emulation of commercial laboratory models.
2. Conduct an independent and objective review of systems, practices and procedures.
3. Understand the cost structure – both pool and base components – to identify opportunities for cost reduction.
4. Summarize the impact of regulatory requirements and DOE orders on WSCF operation. Identify any items or requirements not required by "commercial" labs that effect competitiveness.
5. Evaluate "Value-Added" Features of the Laboratory.
6. Interview selected major clients to identify needs and outlook going forward.

D. Develop Description of Laboratory Operations With Near-Commercial Practices

1. Using existing information and observations made during laboratory assessments compare WSCF operations to commercial laboratory operations
2. Make concrete recommendations to reduce total costs, re-engineer processes and procedures, and change the rules to reduce base and pool costs.
3. Identify what can be done by laboratory management, DOE, and Fluor to increase the success, usefulness, and cost competitiveness of WSCF.
4. Suggest further actions needed to insure WSCF's sustained availability as a site resource.
5. Evaluate best commercial-like fit as "industrial process support like" or "commercial testing like" laboratory

E. Draft Summary Report

1. Executive Summary
2. Introduction addressing study design, accomplishments, caveats and limitations.
3. Characterization of WSCF strength, weaknesses, accomplishments, and threats.
4. Discussion of "value-added" benefits of WSCF.
5. Challenges to operating WSCF like a commercial laboratory.
6. Immediate actions recommended to increase efficiencies, quality and service to customer.
7. General Overall Recommendations
8. Recommendations to change operating environment.
9. Recommendations requiring limited investments (capital and human resources
10. Recommendations involving longer term and more investments (capital and human resources)
11. Further actions to insure sustained operation.

IIII. Milestones and Schedule

A. Plan of Action
Deliverable – Rough outline describing plan of action
Target delivery date – January 23, 2001
Discussion and finalization to Fluor Analytical Services manager January 29, 2001

B. Operations Review
Deliverable – Letter briefly describing information collected for incorporation into the report
Target delivery date – February 9, 2001

C. Draft Report
Deliverable – Draft report distributed to Fluor laboratory services manager
Target delivery date – February 16, 2001. Response from Fluor Analytical Services manager expected within 48 hours

D. Final Report
Deliverable – Final Report
Target delivery date – February 23, 2001

F. Issue Final Report with Comments Incorporated
1. Receive comments from DOE-RL contact and Fluor Analytical Services manager.
2. Edit report to incorporate comments.

Respectfully submitted,
Analytical Excellence, Inc.

John E. Farrell, III
President

Exhibit B
AEX TEAM CREDENTIALS

Analytical Excellence, Inc.

Features, Benefits and Qualifications Statement[1]

An Integrated Coordinated Approach to Managing Change

Analytical Excellence, Inc. (AEX) is an independent strictly confidential consulting firm of environmental experts, chemists and engineers. AEX enables our clients to *manage the change process* while continuing to focus precious management resources on servicing customers. AEX helps management take a critical look at ways to dramatically improve service to clients and reduce the cost of supplying those services. ***By looking "completely differently" at the way products and services are generated, companies achieve client satisfaction and superior shareholder return.***

AEX specializes in providing consulting services, audits, business evaluations and in recommending practical solutions to solve difficult problems with laboratory operations, quality systems, technical analyzes and all matters concerning the generation of analytical data to support effective compliance decision making and aspects of litigation. AEX provides services related to business management, process controls, quality systems management, regulatory compliance, data review and liaison with government agencies to support data acceptance. ***AEX's clientele consist of well-known small and large laboratory companies, instrument manufacturers, engineering firms and legal firms.***

AEX routinely provides technical support and analysis on a variety of levels and in conjunction with interpretation of data for necessary regulatory agencies. AEX is an active in a number of industry activities and professional associations. AEX's principle is an invited speaker at technical and industry conferences presenting on such topics as laboratory operations, sales management and industry outlook and trends. ***AEX experts are routinely called upon to provide method/policy reviews for a number of government agencies, quality organizations, publications and industry.***

AEX and its principle hold a number of distinctions, awards and certificates including:

Environmental Lead Assessor, A2LA trained environmental assessor, appointed NELAC accrediting authority committee, editorial advisory board - Environmental Lab Washington Report, ISO/IEC Guide 25/ISO 9000 Lead Assessor, A2LA Environmental Advisory Committee, appointed interim Board of Director - Southern Environmental Business Council, Who's Who Worldwide, founding member - IAETL Board of Director, appointed executive committee - ACIL's Environmental Section, past chair - IAETL accreditation committee, co-chair ACIL's Ethics and Integrity committee, Qualified as an expert witness in laboratory operations in several states.

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[1]*Revised: January 1, 1997*

AEX provides immediate value to clients with customized services in seven(7) major areas

Quality Systems (QS) Assessment and Cost-effective (QS) Development

The market place continues to change. The opportunities presented by multinational corporations operating globally as well as domestic initiatives are all pointing toward developing Quality Systems in accordance with ISO/IEC guidelines. Laboratory Approval Programs (i.e. NELAC, USCOE. NAVY, AFCEE, etc.) are rapidly moving toward *"quality systems."* ***AEX experts are intimately familiar with all of these standards, actually having been involved in developing a number of them.*** Each is an experienced laboratory manager or QA officer and are trained as assessors by internationally and nationally recognized organizations.

AEX critically evaluates companies' systems, practices and procedures to help our clients assure a cost-effective operation by providing recommendations and practical solutions for strengthening a company's quality system and to assist clients in meeting the stringent requirements associated with the above approval program.

Minimizing Exposure and Risk of Government Actions

In these tough times, laboratories are constantly being scrutinized by regulators for allegations of wrongdoing. ***There is a very fine line between actions being considered mistakes, poor judgment, civil wrongdoing or criminal behavior.*** The impact on business and reputation can and will be devastating to even a strongly profitable operation. *These are "bet your business" situations that must be handled properly to minimize exposure and cost.* Surviving requires understanding, planning and management of the crisis ***'Prevention' beats 'damage control' any day and costs a lot less!*** AEX provides services that:

(1) critically and objectively assess systems, practices and operational procedures recommending prevention tools and strategies to deter and detect improper behaviors,
(2) assist in successfully resolving and steering through challenges by government actions,
(3) provide comprehensive and critical investigations to determine present responsibility.

Training, Facilitation, and Management

As consolidations continues, as clients become more demanding and as laboratory approval programs become more complex, the real competitive edge

comes by having the best trained analysts, supervisors and managers. AEX provides solid and practical technical, quality and business oriented training programs that provide immediate value and superior *'take home'* advantage. ***Take advantage of our experienced trainers all whom have operated a successful laboratory operation.*** AEX has developed a number of customized training modules. Here are a few of the more popular offerings:

``Management through Quality Systems''
"Practical Ethics and Integrity for Laboratory analysts and managers"
"Developing Company Values -Getting Everyone's Buy-in and Pointing North."
"Enhancing Operations through Measure and Display"
"Simplified laboratory Quality Assurance Practices"
" Fraud Prevention Practices for Management"

Excellence in Laboratory Operations

Continuous improvement that increases throughput, decrease errors, cost, waste and rework while delighting customers with superior service. Through initial Laboratory assessments, determine process "gaps" and solutions using manufacturing industry tools, performance monitoring and systems development. *Become the Preferred Low Cost Provider of Value to Clients.*

Commercial (*Sales and Strategic Market)* Development

Are you in the 'right' niche markets to exploit your strengths? What new markets will drive your business in the next years? What should my sales staff be doing?
Development of sound Sales, Marketing and Customer Service programs are critical to continually support and drive efficient operations. Determine the correct market segments using industry, customer, survey and competitive data to target the "high profit" customer segments and differentiate yourself from the pack.

Data User Support and Successful Project Set-up

Data Quality Objectives(DQOs) are best met by successful up-front planning, sound technical expertise and communication. **AEX's** experts have extensive technical and regulatory expertise in all aspects of environmental analytical testing, sampling, Quality Assurance and project planning. Background in applications to support CERCLA, SARA, RCRA, SDWA and CWA. Qualified as an expert witness in several states.

Regulatory Liaison, Communication and Support

Technical, regulatory and laboratory expertise to help assure smooth effective communication to resolve data challenges, Cure notices and performance

discrepancies. Independent assessments of "root" causes and recommendation on practical solutions through quality management systems. *"Damage Control" While Minimizing Conflict.*

The AEX Difference is Experience and Results

Analytical Excellence, Inc. is different from other management consultants. AEX uses a *"hands-on"* approach to solving your particular business challenges, working with your talented staff and making recommendations based on years of experience managing laboratory operations.

AEX's expertise provides the following competitive edge:

First hand experience of over twenty(20) years of experience in the environmental laboratory business,

Access to a network of the best technical, operations and quality professionals, cumulatively over 100 years of experience, at your disposal to work on your particular challenges,

Access to key regulatory staff, enforcement officials and customer executives to get information and get the job done,

Experience having reviewed and worked with over fifty(50) laboratories and companies,

A proven track record in successfully managing laboratories in a change mode,

A focus on the environmental laboratory as a CORE business, not a sideline,

Experience in having *"walked in your shoes"* reporting to directly to shareholders,

Well rounded expertise in almost all facets of managing, producing, expanding and controlling modern environmental laboratories in this tough economy.

Extensive Technical, Marketing, Sales, Operations, Government Relations and Industry knowledge, and

A respected leader in this industry with a reputation based on technical expertise, integrity and credibility.

Analytical Excellence, Inc. Gets Results (our Clients say so!)

The true test of success and value rests with accomplishments.

Listed below are just a few of our more recent accomplishments for clients. *AEX recommends practical solutions with measurable results.*

- Contracted by a Fortune 1000 parent company to assembled a team of technical and legal experts and conduct an independent investigation of an environmental laboratory accused of fraudulent behavior on government contracts. Report was used to minimize company exposure and to enter into a settlement agreement.

- Implemented systems and tools in a GC/MS Semivolatile department to increase on time delivery from 40% to 98%.

- Re-engineer the Inorganics departments of a major laboratory providing recommendations to double or triple capacity without any increase in headcount or outlay of capital for 12 months.

- Conducted an operations review and assessment that enabled management to save five(5) FTEs by eliminating redundant non value steps in processes.

- Facilitated a cross function team to redesign the customer service/project management function to be 80% focused on customer contact by value engineering operations and data review duties to a minimum.

- Conducted a quality assessment and development of Correction Action plan to implement systems for decreasing holding time violations.

- Conducted a quality/technical assessment and recommended establishment of systems to correct a Cure notice and challenge to laboratories integrity and credibility. Worked with the relevant Agency to preserve clients reputation as valued supplier.

- Constructed a program of Measure and Display of Key performance indicators to assist management in developing and administering a continuous improvement program.

- Assisted a major instrument manufacturer in evaluation and entrance into a new market segment using specialized technology for the laboratory community.

- Assisted a major environmental laboratory to have a government suspension lifted by critically reviewing laboratory operation and showing present responsibility

- Have conducted for clients over nine(9) detailed **prevention** assessments to help management enhance systems, practices and procedures and thereby minimize exposure of

fraudulent behaviors.

Recent accomplishments continued:

Critically reviewed, evaluated and consulted for over fifty(50) laboratories in matters of compliance, productivity, business development and quality systems.

Contracted by the Board of Directors of a major third party accreditor to develop business and marketing practices to further capitalize on particular markets.

Contracted by the parent companies of two leading laboratory networks to facilitate merger discussions between the management team of the two companies.

Advise a major instrument manufacturer to rationalize the feasibility of further developing automated products for direct field testing.

Assist an environmental laboratory company to develop systems, practices and procedures to comply with a major DOD program, thereby allowing them entrance into a new lucrative market segment.

Provided expert consultation to five(5) companies regarding the feasibility of closing laboratory operations and the process for orderly and economical shutdown.

AEX has the right resources at the right time to the best value and superior returns to shareholders.

We are the premier leading provider of analytical and business management consultation to environmental laboratories and users of analytical data.

Thank you for considering Analytical Excellence, Inc.

John E. Farrell, III

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Altamonte Springs, FL 32701
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PROFESSIONAL PROFILE[1]

SUMMARY

An energetic seasoned manager and dynamic facilitator with extensive technical, sales, marketing, operation and communication skills. A well rounded business veteran with over 22 years of experience in all facets of managing, expanding and leading a successful environmental analytical laboratory business. A knowledgeable well respected leader helping to shape the future business outlook and practices of a maturing industry.

EXPERTISE

Environmental chemistry, Chromatographer (glc/detectors, hplc, gpc), Mass Spectroscopy (gc/ms), Inorganics (gfaa, faa), Operations Management, Program Management, Sales and Marketing, Quality Assurance, Expert Witness, Government Relations, Strategic and Tactical Planning, Data Evaluation and Technical Consulting.

PROFESSIONAL ACCOMPLISHMENTS

General and Operations Management

* Successfully initiate, develop and operate a start up consulting operations company within the highly competitive and financially distressed environmental testing industry; focused on helping environmental companies increase operating performance. **Analytical Excellence, Inc.(AEX)** has been in existence for only six(6) short years during which AEX has developed a network of twelve(12) professional associates, an nationwide client base of environmental labs, instrument manufacturers, legal representatiion firms, product testing labs and engineering consulting firms. AEX continues to have double digit growth, remain financially stable and healthy.

* Contracted as an independent industry expert to facilitate merger and acquisition discussions between two major environmental testing networks (by the parent companies) to identify, value and sanity check negotiation and benefits to shareholders of a potential resultant company.

* Planned, implemented and managed a reorganization of a $10 milliion dollar laboratory operation by restructuring the market segments and operations. This program effectively reduced losses from 1.5M in 1991 to 0.1M in 1992. This was accomplished by changing the operations into a team based structure, restricting products to three main lines and focusing on decreasing turnaround time, holding time violation and giving responsive service to clients.

1

Professional Accomplishments cont.

General and Operations Management continued

* Successfully planned and implemented closure of Enseco's Cambridge Laboratory operation. This delicate project was accomplished within budget estimates, while minimizing risk to Enseco and retaining/transferring over 75% of the client base to the Somerset facility. This project is expected to save an estimated $3.75M over two years.

* Increased operating margins at the Somerset facility by 35% from 1991 to 1992. This was accomplished by consolidating functions between operations and growth by expansion of client base.

* Organized two distinct and separate laboratory management groups into one cohesive management team for the entire eastern region. This allowed us to save an estimated $450K in cost by consolidation.

Strategic and Tactical Planning

* Developed a tactical retooling plan designed to dramatically improve productivity and efficiency in operations using results based TQM (KRI's and measure/display), cycle time reduction(IMPACT) and problem solving techniques to increase utilization. Implementation required 18 months and was estimated to net $5.0 M in savings and incremental margins by 1997.

* Devised and implemented a regional plan to strategically refocus sales territories toward more profitable market segments (eg. federal facilities and DOD) capitalizing on size and service differentiation.

* Initiated and directed a network wide program to portal projects and samples between laboratories, assisting in load leveling between facilities decreasing overtime during peaks and valleys and increasing service to clients.

Sales Management and Market Development

* Developed a Sales and Marketing plan to strategically increase the DOD market segment in Enseco's Eastern and Wadsworth regions from 8% of sales to 40% of sales in three years. 1994 estimates based on plan are for a 300% increase over 1993.

* Directed the opening of a new geographic territory, increasing sales by 1.0 M in one year.

* Pioneered development and role out of a system to value engineer the project management function within Enseco's network. Established a framework and network wide system entitled "Prospecting for Enseco Gold" to increase service and responsiveness to clients and increase reoccurring sales based on relationships with project managers.

Professional Accomplishments cont.

Technical Expertise

* Qualified and accepted as an expert witness in environmental chemistry and/or laboratory operations in several states including New Jersey, Louisiana, and Pennsylvania.

* Completed training and approved to conduct ***Assessments of Quality Systems*** according to International Standards (ISO) 9000 series standards and Guide 25 for laboratories by the **American Association of Laboratory Accreditation** and **National Association of Testing Authorities, Australia .**

* Completed training and approved as a laboratory assessor for ***Environmental Lead*** under the USEPA program standards.

* Developed and maintain a credible technical reputation as a leader in the industry with USEPA and various state agencies. Called upon to review methods, policies and regulations prior to implementation by a number of agencies and organizations.

* Developed and successfully managed a vertical laboratory organization, a lab within a lab (work group), within a much larger horizontal organization to increase service, reduce costs and remain contract compliant for USEPA CLP contract and NJDEP contract work.

* Conducted a quality assessment and development of Correction Action plan to implement systems for decreasing holding time violations.

* Conducted a quality/technical assessment and recommended establishment of systems to correct a Cure notice and challenge to laboratories integrity and credibility. Worked with the relevant Agency to preserve clients reputation as a valued supplier.

* Constructed a program of Measure and Display of Key performance indicators to assist laboratory management in developing and administering a continuous improvement program.

* Invited as a speaker at technical and industry conferences presenting on such topics as laboratory operations, sales management and industry outlook and trends.

* Negotiated revisions to superfund consent order and QAPJP changes to analytical scheme saving over $150K in clean up costs.

* Designed a sampling and analysis plan to save a major PRP group over 1.0M in testing costs.

Professional Accomplishments cont.

Technical Expertise continued

* Installed as a charter member of the NJDEPE Laboratory Advisory Council establishing a technical communications link between the laboratories and government on policy and regulations.

* Managed industry trade organization's efforts toward obtaining National Accreditation for environmental laboratories. Established a committee process and organization that IAETL is using as a model for all committee activities.

* Co-founded the first state chapter of IAETL in New Jersey. Developed an organizational model for all future state chapters that has been adopted by IAETL's Board of Directors.

EMPLOYMENT EXPERIENCE

Analytical Excellence, Inc.(AEX), Altamonte Springs, FL.

* **President and Senior Environmental Analyst (12/93-present)**

AEX is an independent strictly confidential consulting firm specializing in environmental laboratory analysis and matters concerning the generation of analytical data to support effective compliance decision making and aspects of litigation.

AEX was founded in 1993 as a start up consulting operations company within the highly competitive and financially distressed environmental testing industry. AEX focuses on helping companies, predominantly environmental companies, establish quality systems, increase operating performance, establish business and marketing programs and reduce business risk and liability. **Analytical Excellence, Inc.(AEX)** has been in existence for only four and one half (4 1/2) short years. AEX has developed a network of twelve(12) professional and independent associates, an nationwide client base of environmental labs. instrument manufacturers, legal representatiion firms, product testing labs and engineering consulting firms. AEX continues to have double digit growth, remain financially stable and healthy.

As Senior Environmental Analyst, responsible for all facets of reviewing laboratories; including instrumentation, data systems, quality control and assurance programs, generation of analytical data, field sampling and document control. Provide technical support and analysis on a variety of levels and in conjunction with interpretation of data for necessary regulatory agencies.

Enseco, a division of Corning Laboratory Services, Inc., Somerset, N.J.

* Vice President of Market Development (5/93-12/93)
* Vice President and General Manager - Eastern Region (4/91-5/93),
* Division Director Erco Laboratory, Cambridge, Mass. (11/90-5/92),
* Corporate Director of Production Planning and Control (8/90-10/90)
* Corporate Director of Program Administration (1/90-10/90).

As Vice President and General Manager of Enseco's Eastern Region, responsible for the top and bottom line performance of Enseco's Eastern Region with revenue in 1992 of $16 million. These responsibilities included all facets of business and operation management including profit and loss, sales, operations, and facilities for multiple laboratories in the eastern United States.

Environmental Testing and Certification Corporation, Edison, New Jersey.

* Manager Sales Development and Technical Support (1/86-1/90)
* Area Manager, CLP work Team (1/85-1/86)
* Team Leader, GCMS Laboratory (1/84-1/85)

Provided technical expertise and support to the marketing and administrative staff for ETC's network of 6 laboratories. Additionally, responsible for overseeing ETC's activities within the USEPA Contract Laboratory Program and was directly responsible for the overall operation of a profit center covering a cross section of ETC's entire operation.

Century Laboratories, Thorofare, N.J.. (1/80-1/84)

Performed various laboratory and management positions including Analyst. Chromatographer, Mass Spectroscopist, Technical Services Manager, and Assistant Laboratory Director for a major environmental testing laboratory. As Assistant Laboratory Director. responsible for the operation of an automated, inorganic, and organic laboratory in a production setting.

Initial duties at Century included design of facilities, purchasing, and installation and setup of an automated GC and GC/MS laboratory to perform environmental analysis according to USEPA and CLP protocols.

Testwell Craig Testing Laboratories, Inc., Mays Landing, N.J. (6/77-1/80)

Testwell Craig is a multidisipline construction materials and environmental testing laboratory serving the northeastern United States.

ACADEMIC BACKGROUND

B.S., Chemistry, Richard Stockton State College, Pomona, New Jersey 1977

B.A., Biological Sciences, Richard Stockton State College, member Charter Class 1975

member, Charter Class Richard Stockton State College (1971-1975)

PROFESSIONAL AFFILIATIONS

Member, International Association of Environmental Testing Laboratories (IAETL). Appointed to Board of Directors, June 15, 1989 - December 15, 1991. Chairperson of Accreditation and Certification committee, member technical committee, member government relations committee, member mixed waste committee. Co-founder of New Jersey chapter of IAETL in 1993. This is the first state chapter of IAETL and acts as a pilot for all future chapter formation.

Executive Committee member, Environmental Section of ACIL.

Member, American Chemical Society, environmental and analytical sections; local chapter participant

Member, American Society for Testing and Materials D34 Committee; D34.10 Subcommittee on Good Lab Practices.

Member, Americian Association for Laboratory Accreditation

Member, Delaware Valley Chromatography Forum

Member, Delaware Valley Association of Mass Spectroscopists

Member, Consortium for Quality Environmental Data (CQED) Executive Committee and Technical Committee

Member, New Jersey Water Pollution Control Federation (NJWPCF) Hazardous Waste Subcommittee

Member, New York and Pennsylvania Association of Analytical Environmental Laboratories (NYAAEL & PAAEL)

PROFESSIONAL SPEAKING ENGAGEMENTS

"Role of the Analytical Laboratory in Regulatory Compliance" Stockton State College Environmental Seminar, Pomona, New Jersey, March 1989

"Do Multiple State and Federal Certification Programs Enhance the Quality of Environmental Data" Quality Assurance in Environmental Measurements Workshop sponsored by USEPA/USATHAMA Las Vegas, Nevada, May 1989

"Managing Environmental Sites and Regulatory Compliance Electronically - A Laboratory Perspective" USEPA CLP Data Management Caucus, Las Vegas, Nevada, June 1989

"Is Uniform National Accreditation of Environmental Laboratories Really Possible?" Rocky Mountain Conference Special Symposium on Environmental Monitoring in the 1990's. Denver, Co. July 1990.

"Presentation to the EMMC regarding the feasibility of a National Accreditation for Laboratories" Washington, DC., August 1990.

"Commercial Laboratory Position on National Accreditation of Environmental Testing Laboratories" Enviracs/OSWER conference, Washington, DC. July 1993

"Commercial Laboratory Position on National Accreditation of Environmental Testing Laboratories" ASTM Environmental conference, Dallas, Tx. Dec. 1993.

AUnderstanding and Minimizing Exposure of Instances of Waste, Fraud and Abuse in the Environmental Laboratory@ ACIL Environmental Conference, Ypsalani, Mi. May 1995

IAETL Annual Conference

"Ramifications of State Certification Programs on Environmental Laboratories," Washington, DC, October 1988

"Data Validation - A Laboratory Perspective" Baltimore, MD. October 1989

"Managing a Laboratory Operation" Baltimore, MD. October 1989.

"Report to the Membership on National Laboratory Accreditation Committee Activities" a Panel discussion; Baltimore, MD. October 1989

"Report to the Membership on National Laboratory Accreditation Committee Activities" a Panel discussion; Virginia Beach, Va. October 1990

"Update on Committee efforts on Laboratory Accreditation" Tampa, FLA.. October 1992

"The March toward National Laboratory Accreditation for Environmental Laboratories" San Diego, Ca. September 1993

BARRY A. STEPHENSON

Education

M.S., Science Education, University of Tennessee, 1970
B.S., Chemistry, University of Tennessee, 1965

Present Position

President. CEO, Materials and Chemistry Laboratory, Inc.

Relevant Experience

- 30 years of experience in analytical laboratory, environment monitoring and field programs
- Project management
- Program and business development
- Building and start-up of central, mobile, and on-site laboratories
- Oversight of a commercial mixed waste treatability laboratory
- Management and operation of field analytical and sampling services
- Commercialization of DOE Laboratory Facilities

Employment History

President, CEO, 1998-Present
Materials and Chemistry Laboratory, Inc.

Responsible for the administrative oversight and technical direction of Materials and Chemistry Laboratory (MCLinc) in Oak Ridge, Tennessee. Commercialized a former DOE laboratory and initiated operations as an employee-owned company. Responsible for site operations, business development and quality of technical and fiscal performance of the laboratory. MCL provides services in the areas of waste treatability, environmental process evaluations and optimization, environmental and technology development.

National Director, Field Analytical Services, 1993 to 1997
Quanterra, Inc., Knoxville, Tennessee

Directed the day-to-day operations of the Field Analytical Services group with four offices across the country and annual sales of over $6 million. He directed 45 environmental professionals who operated mobile and on-site laboratories, designed analytical programs to support environmental restoration projects, developed and modified analytical procedures for unique applications, developed and implemented field sampling and data management guidelines, and provided quality control of field collection projects.

Projects performed included sampling and analysis of hazardous waste incinerator trial burns Occupational Safety and Health Administration (OSHA) and industrial hygiene field surveys, PCB clean-ups, National Pollution Discharge System (NPDES) monitoring programs, surface and groundwater assessments, waste characterization, on-site laboratory operations and hazardous waste site assessments. Also successful bid and managed a privatization initiative for DOE's Rocky Flats plant in which Quanterra provided $4 million in technical support for the M&I contractor. The project was specifically directed toward commercialization of analytical laboratories at Rocky Flats.

Director of Analytical Business Development, 1991 to 1992

IT Corporation, Knoxville, Tennessee

Prepared analytical bids and proposals, developed strategic business plans and directed new business development for the $56-million-per-year analytical business unit. Bids and proposals ranged in value from several thousand dollars to $125 million multi-year contracts. He developed performance measures for the laboratories and managed special projects such as the development of a government-approved pricing system. Also developed and managed the Analytical Service Corps, a flexible staffing concept for the laboratories.

Director of Southern Operations, 1988 to 1991
IT Corporation, Oak Ridge, Tennessee

Managed the technical and business development of four laboratories with annual sales of over $22 million. These laboratories employed over 100 people and performed a full range of environmental analyses for hazardous, radioactive, and mixed waste constituents including treatability studies. The Technology Development Laboratory pioneered the development of methods for the analysis of dioxins/furans and PCBs. By marketing the services of this internal R&D laboratory, he brought it to commercial profitability in 18 months. Under his direction, the Environmental Technology Development Center was decommissioned and relicensed to perform geological testing and pilot studies, which involved radiological materials. This laboratory was one of the only facilities in the country that could perform geological testing of radiologically contaminated materials.

Director of Analytical Business Development. 1986 to 1988
IT Corporation, Knoxville, Tennessee

Managed the analytical nationwide marketing programs and analytical support for inter-company projects. He established the positions of Technical Service Representative and Customer Service Representative in the IT laboratories and guided their activities, raising the level of customer satisfaction.

Manager, Field Analytical Services, (FAS), 1984 to 1986
IT Corporation, Knoxville, Tennessee

Managed the Fas business unit providing coordination of field sampling and field analytical support for IT's projects across the country. He managed all administrative and support functions of the business unit and provided technical guidance as analytical chemist to project design and management for field sampling projects.

General Manager, IT Analytical Services, 1981 to 1984
IT Corporation, Knoxville, Tennessee

Began as Manager of Customer Service, Sales, and Marketing for Stewart Laboratories, which was acquired by IT in 1981, and was promoted to General Manager in 1982. He negotiated the sale of the laboratory to IT.

Assistant Vice President, Manager of Administrative Services, 1968 to 1981
Stewart Laboratories, Knoxville, Tennessee

Held positions of increasing responsibility culminating in management of the laboratory. Performed all management and supervisory duties necessary to operate and develop the laboratory. Under his direction, sales increased from $25,000 per year to over $1.2 million per year.

Chemistry and Physics Instructor, 1965 to 1970
Roane County Schools, Kingston, Tennessee, and Oak Ridge Associated Universities

Taught chemistry to high school juniors and seniors for four years and physics to junior college students for one year while completing master's degree.

Resume of Jack Hall

Qualifications Summary

Mr. Hall is a professional chemist with 36 years of experience in all areas associated with the collection, chemical analysis, and data interpretation of environmental samples. He also is experienced in, the design of mobile laboratories, personnel management, project management, laboratory management and coordinating the analytical analyses and monitoring needs for the startup of waste treatment and chemical pilot plants. His project experience includes method development for organic pollutants, compliance testing for specific U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) organics and inorganic contracts, determination of dioxins/furans by low/high resolution gas chromatography/mass spectrometry (GC/MS), testing of emissions from waste treatment and manufacturing processes, analysis of hazardous pollutants in waste materials and environmental media. Experience includes testing of specific emissions from incinerator trial burns for a variety of wastes, and developing and implementing the associated QA programs. Knowledgeable in Clean Water Act, CERCLA and Resource Conservation and Recovery Act (RCRA) methods and analyses, selection and implementation of Laboratory information Management Systems, and the development / implementation of QA programs. Mr. Hall was most recently responsible for Quanterra's Corporate Quality Assurance group charged with total quality oversight and maintaining quality leadership of the Quanterra network of 12 laboratories. Currently a member of the NELAC On-Site Assessment Committee and have recently completed NELAC assessor training.

Professional Experience

Technical Consultant
Interpretive Consulting - Oak Ridge, Tennessee 3/2000 – Present
Providing consulting services including evaluation of analytical data, environmental methodology, data integrity issues, and quality assurance programs. Providing related training. Assisting clients on laboratory evaluation/selection, pre-audit assistance and audits per various governmental and client programs including NELAC.

Corporate Director, Quality Assurance
Quanterra, Inc.- Knoxville, Tennessee-February 1996 to March, 2000
Responsible for the Quanterra Quality Assurance Program that sets the guidelines, policies, standard operating procedures and related documentation for the quality systems in the Quanterra network of laboratories. Each operating unit has a Quality Assurance Manager that is responsible to the Corporate QA Director. Developed a single nation-wide QA program for all laboratories.

Director of Technology
Quanterra Environmental Services--Knoxville, Tennessee--June 1994 to January 1996
Responsible for the Quanterra Technology Group that evaluates, develops and implements new technologies or process improvements across the Quanterra Laboratory Network. Responsibilities also include, providing technical support to internal and external clients as well as, sales and customer service representatives.

Technical Director
Analytical Services Division, IT Corporation,--Knoxville, Tennessee--1992 to June 1994
Responsible for evaluation and implementation of technology for ITAS to maintain a safe, high quality, technical leadership in the analytical services field. The responsibilities included coordinating the technical direction of the Analytical Services operations, providing technical leadership on client related technical problems, technical consulting and coordination of ITAS Quality Control and Health and Safety activities.

Director, Technology Development Laboratories
IT Corporation,--Knoxville, Tennessee--1991 to 1992
Responsible for directing the operation of two laboratories. One laboratory in Knoxville, Tennessee was involved in the performance of bench-to-pilot scale waste treatability studies; development of analytical chemistry methods and specialized analyses; and low resolution/high resolution dioxin/furan and PCB analyses. The second laboratory in Oak Ridge, Tennessee was a radiochemical hazardous chemical and mixed wastes, and geotechnical analyses of contaminated soils. The responsibilities included business development, client satisfaction, new technology evaluation, growth of operations, QA/QC staffing budgets (Capital and Operating), safety and training of all personnel.

Director, Laboratory Systems Developments
Analytical Services, IT Corporation,--Knoxville, Tennessee--1990 to 1991
Directed an internally developed Laboratory Information Management System (LIMS) for ITAS; development of new business areas (i.e., Air Quality under Clear Air Act (CAA) and expanding rapidly growing markets by acquiring new laboratories in mixed waste and radiochemical analysis) and leading the ITAS transition team in the restart of new acquisitions in Richland, Washington and St. Louis, Missouri. Implemented all activities required that will assure a safe restart meeting the quality requirements of ITAS and the client (i.e., building modifications, training and implementing a laboratory-specific QA program).

Director Analytical Operations
Analytical Services, IT Corporation,--Knoxville, Tennessee--1988 to 1990
Responsible for nine environmental analytical service laboratories and two field analytical service groups. Major responsibilities and duties included:

- Evaluated laboratory operations and improve as needed to meet quality, health and safety, sales and profit goals.
- Planned and implemented operation improvements including new technologies.
- Oversaw development and initiation of capital improvements and expenditures. Current capital budget is $7.5 million.
- Developed and met budgets for all operations.
- Managed a workforce of over 500 technical/professional personnel.

Director of Southern Analytical Operations
Analytical Services, IT Corporation--Knoxville, Tennessee--1984 to 1988
Responsible for four analytical services laboratories with the following major tasks:

- Provided consulting and analytical services to industrial and governmental clients.
- Full-service capabilities for analyzing environmental media and hazardous materials for inorganic and organic constituents at the part-per trillion through percent levels.
- Responsible for negotiating and managing large analytical services contracts, introduction of new technologies into the laboratories, budgeting, and quality assurance of the laboratories.

Manager, Proposal Administration

Analytical Services, IT Corporation--Knoxville, Tennessee--1982 to 1984
Evaluated requests for proposals and managed the preparation of proposals for analytical, engineering, and technical services. Managed special analytical chemistry projects (EPA Interlaboratory Study for Priority Pollutants).

Vice-President/Manager of Analytical and Technical Services

IT Enviroscience, Division of IT Corporation--Knoxville, Tennessee--1980 to 1982
Managed the IT Environmental analytical laboratory and oversaw conceptual design through construction of a state-of-the-art, limited-access analytical laboratory for analyzing extremely hazardous materials as an addition to the Knoxville laboratory and a 40 foot mobile laboratory with similar capabilities.

Manager, Analytical Services Department

Hydroscience, Inc.--Knoxville, Tennessee--1975 to 1980
Maintained analytical technology of Hydroscience at a high level of the state-of-the-art. Utilizing extensive experience in chromatography, managed the Knoxville laboratory Analytical Services Group, which specialized in the analysis of trace organic compounds in environmental matrices.

Senior Analytical Chemist

Michigan Division Analytical Laboratories and Waste Department--
Dow Chemical Company, Midland, Michigan--1968 to 1975
Responsible for the analysis of environmental samples in the Michigan Division analytical laboratory. Functions included development of procedures for in-plant monitoring of all discharges. Compounds thoroughly studied included chlorinated benzene, 2.4-dichlorophenoxy acetic acid, 0,0- dimethyl-o (3,5,6-trichlor-2-pridyl phosphate), salicylic acid, glycol ethers, and polyethylene glycols. Also responsible for research and method development. Coordinated air- and water-sampling programs in production processes of phenol, alkyl phenols, chlorinated phenolics, chlorinated benzenes, and herbicides. Under the waste control department was responsible for analysis of samples from waste control research projects and wastewater treatment plants. Involved in implementation of new analytical instrumentation in the laboratory and on-stream at the WWTP.

Supervisor, Radiological Health Analytical Section

Pennsylvania Department of Health, Harrisburg, Pennsylvania--1964 to 1968
Primary function of group was the analysis of air, water and milk for radiological constituents. Also functioned as a chemist for a brief period, responsible for sampling and analysis of industrial wastewaters of Pennsylvania for compliance with state and federal discharge permits. Worked with other regulatory agencies on analytical method development and training programs. Experience included reviewing process chemistry of chemical, pharmaceutical, and formulating plants and requesting discharge permits. Evaluated potential air and water discharges.

Education

B.S. in Chemistry
Pennsylvania State University, University Park, Pennsylvania; 1962

Laboratory Safety Training, IT Corporation, 1987
DuPont Safety Training, Knoxville, Tennessee, 1990
Executive Management Training, Pennsylvania State University; 1990
Chemical Hygiene Plan Training, IT Corporation, 1991
Total Quality Management Orientation, 1993
Project Management/Financial Software Training, J D. Edwards' 1991
Managing Government Contracts, Educational Services Institute, 1994
IT Project Management Training, 1994
Quanterra Quality Management Plan Training, 1994

Professional Affiliations

American Chemical Society
American Society for Testing and Materials
American Institute of Chemists
American Management Association
Sigma XI
Water Environment Federation

Honors

ASTM Max Hecht Award 1994 for distinguished service in water method development.

ASTM Award of Merit 1999 for outstanding service and leadership in water methodology.

Publication

Hall,J.R. and Burrows,R. "The Method Detection Limit Fact or Fantasy" Presented at USEPA OSW Meeting July, 1998
Hall, J.R. "Soil Sampling for Organic Volatiles. Review of Options" Client Seminar Atlanta, GA February 17, 1998
Hall, J.R. and Mills III,Snell A.,"Detection Limits Where are We Going- After 30 Years the Environmental Analytical Chemistry Industry Doesn't Have a Consensus Perimeter" Presented at WEF Environmental Laboratories: Moving Toward the 21st Century Symposium August 3-6, 1997 Hall, J.R. " Confusion Over Method detection Limit(MDL) By the Analysts as Well as the Data User" seminar for IT Corporation. July 1996

Hall, J.R., "Roadblocks to New Technologies in the Environmental Laboratory" presented at ACIL Conference on Sustainable Strategies for Environmental Laboratories, May, 1995.

Hall, J.R., "The Laboratory Audit Process Is Out of Control". International Association of Environmental Testing Laboratories 7th Annual Conference, October, 1994.

Hall, J.R., and Tigley, B.S., "Automation of the Environmental Chemical Laboratory: Where's the Payoff?", Technologies in Hazardous Waste Management, ACS, September, 1994.

Hall, J.R., and Stephenson, B.A., "Analytical Measurements-New Technical Horizons" presented at IT Corporation Technical Symposium, 1993.

Hall, J.R., and Stephenson, B.A., "Analytical Measurements-New Technical Horizons" presented at IT Corporation Technical Symposium, 1993.

Hall, J.R., Organics in Water, ASTM Standardization News, April, 1992.

Hall, J.R. and Glysson, D.G., Editors, Monitoring Water in the 1990's Meeting New Challenges, STP 1102 ASTM, 1992.

Hall, J.R. and Peery D., "The Importance of Sampling and Analytical Methodology in Remediation" presented at Remediation America '91 Seminar April 22-23, 1991, in Orlando, Florida.

Hall, J.R. and Harvey, J.T., "Mixed Waste Analysis: A Paradox of Analytical Chemistry" presented at IT Corporation Technology Exchange Symposium, April 11 - 13, 1991 in Phoenix, Arizona.

Hall, J.R., Stagg, D. and Harvey, J., "Problems in Analysis of Mixed Wastes Samples", presented at 1989 DOE Model Conference in Oak Ridge, Tennessee.

Hall, J.R., "Quality Assurance Information: What Information Should be Collected for Use by Laboratory Management?", presented at 1989 International Association of Environmental Testing Laboratories Conference.

Hall, J.R., Stagg, D., and Clark, S., 1987, "Guidelines and Precautions in Collecting and Analyzing for Mixed Wastes." presented at the 1987 Winter Meeting of the American Nuclear Society.

Hall, J.R., 1983, "Quality Assurance in Environmental Trace Analysis." Liquid Chromatography in Environmental Analysis, edited by James F. Lawrence, Humana Press.

Hall, J.R., Florance, J.R., and Strother, D.L., 1981, EPA Method Study, Method 604-Phenols, Contract No. 68-03-2625, Published by the Quality Assurance Branch, EMSL, EPA, Cincinnati, Ohio.

Hall, J.R., Florance, J.R., and Strother, D.L., 1981, EPA Method Study 22, Method 612-Chlorinated Hydrocarbons, Contract No. 68-03-2625, published by the Quality Assurance Branch, EMSL, EPA, Cincinnati, Ohio.

Hall, J.R., and Florance, J.R., 1980, "Implementation of Quality Assurance Program for the Determination of Trace Organics in Environmental Samples," presented at the 1980 Pittsburgh Conference.

Hall, J.R., Stuewe, C.W., Wilmolth, R.C., and Kennedy, J.L., 1979, Removal of Trace Elements from Acid Mine Drainage, EPA-600/7-79-101.

Hall, J.R., Wass, M.N., and Soloman, R.A., 1978, "Problems Encountered with the EPA Protocol Procedures for Screening of Industrial Wasted Effluents for Priority Pollutants," presented at the 176th National Meeting, American Chemical Society.

Hall, J.R., 1977, "Effect of New Effluent Guidelines of the Industrial Waste Treatment Laboratory," presented at Mid-Atlantic Industrial Waste Conference.

Hall, J.R., 1977, "The Effect of Recent Legislation on the Industrial Wastewater Laboratory," presented at the New York Water Pollution Control Federation Meeting.

Hall, J.R., Florance, J.R., and Fox, R.D., 1976, "Role of New Techniques in Water Analysis," presented at the 315t Purdue Industrial Waste Conference.

Hall, J.R., 1970, "Determination of Select Phtalates in Wastewater," presented at the 166th National Meeting American Chemical Society.

Hall, J.R., Richards, R.T., and Donovan, D.T., 1967, "A Preliminary Report on the Use of Silver Metal Membrane Filters in Sampling for Coal Tar Pitch Volatiles," American Industrial Hygiene Assoc. J.

Exhibit C
DOE BRIEFING PRESENTATION

Preliminary Briefing
WSCF Commercial Practices Concept Plan & Progress

Presented by: *Analytical Excellence, Inc. ,*
MCLinc & Interpretive Consulting
Presented to: *Fluor Hanford, Inc. & DOE-RL*
Presented on: *January 31, 2001*

Introduction

- Initially discussed interest and qualifications – Oct. 2000
- AEX Responded to FHI Request of Dec. 2000
- AEX engaged Jan. 14, 2001
- Assembled a team of 3 Industry Experts
- Initial On-site visit 1/14/01 –1/17/01

The DOE –RL Task Order

... As part of the FY2001 effort, FHI is also requested to submit a plan ... for achieving comparability of WSCF to commercial laboratories, defining actions needed on the part of DOE and contractors. Commercial comparability means to come as close as possible in total cost to DOE for a given scope of work (service) conducted at WSCF as through a commercial contract. Comparability includes sustainability i.e. the ability to continue the cost and benefit over the long term. ...

Excerpted from DOE directive to FHI dated June 21, 2000: 00-OSS-356

The AEX Team

AEX has assembled a team of industry experts to accomplish the objectives of this task.

- Over 85 years of environmental laboratory experience.
- Covers the breadth of technology, management, quality, customer service and business development.
- All are well respected leaders of Testing Industry.
- Each has specific key expertise to necessary to project.
- All are chemists and business managers.

The AEX Team

- **Barry Stephenson**
  - 30 years of analytical and mgmt. expertise
  - Successfully commercialized a former DOE laboratory –***MCLinc.***
  - Led team on six month study of commercialization opportunities at Rocky Flats
- **Jack Hall**
  - 36 years of analytical, quality assurance and mgmt. experience
  - Director of Corporate QA – Quanterra
  - Director of Technology and Development – Quanterra (& ITAS)
  - Past Board member of IAETL

Radiochemistry-:-Mixed Waste-:-Technology-:-Operations

The AEX Team

- **Jack Farrell**
  - **26 years of analytical, quality, business mgmt. , data integrity, and customer service experience**
  - **ACIL-ESS board member –past IAETL board member**
  - **Experienced in process control, ISO9000 and simplification procedures**
  - **Work with a large contingent of commercial laboratories**
  - **President – AEX Inc.**

Industry knowledge-:-Management-:-Best Practices

Thinking out of the Box

In an effort to look at this differently, …

- What if … *you inherited this lab operation today and needed to make money in a commercial and competitive market …*
- What if … *the operation was moved just outside of the Hanford Reservations fence …*
- What if … *a bubble was placed around the laboratory operation (magic ropes) …*

Take an important "Kernel" of service, do it efficiently and with superior service, and then strategically build other services around it – efficiently.

Goals and Objectives

- Develop a plan that identifies and suggests changes in operation and management practices.

- Suggests recommendations to enhance the contribution of the WSCF laboratory by moving towards practices comparable with the commercial testing industry
  - Operational procedures and standards,
  - Cost structure and overhead,
  - Customer Service and performance
  - Quality

- Identify WSCF "value-added benefits to the Hanford complex.

Goals and Objectives

The overall goal is to identify ways to reduce the total cost of the WSCF operation while maintaining its core competency and strengthening its excellence of service.

And

Emphasis is placed on actions DOE & contractors can undertake to construct a sustainable operating environment to foster WSCF as a high quality cost competitive operation.

Areas of Focus

- The Laboratory Operation and Facility not the entire WSCF complex
- Practical and concrete recommendations
- Recommendations based on the Team's expertise and experience.
- Emphasis on not "re-creating the wheel"
- What actions can the laboratory and management take to increase the success, usefulness and cost competitiveness of WSCF?
- What actions can the DOE & contractors take to change the operating environment to increase the success, usefulness and cost competitiveness of WSCF?

Tasks – Buckets

- Develop the plan – *Identify the task and boundaries*
- Review historical information
- Global review from 30,000 feet – *Where to focus efforts.*
- Understand the Costing and Financial structure
  - Direct Costs (Base) and Overhead
  - Indirect Costs (Pools)
- Talk to some major clients – *What are the needs and are they meeting them?*
- Sample Projections – *How much work is there and is it real?*
- Quality Assurance - How much quality is enough?
- Operations/Technology Opportunities –*Evaluate alternate operation schemes*
- Can we streamline the rules?

What is a real obstacle and which are paper walls?

Schedule for Deliverables

A. Plan of Action

Rough outline describing plan of action –target 1/23/01

Finalize plan with Dr. Marcus – 1/29/01

DOE-RL & FHI briefing – 1/31/01

B. Operations Review

Memo describing information collected –target 2/9/01

C. Draft Report

Draft report to Dr. Marcus – target 2/16/01

Response from Dr. Marcus expected within 48 hours

D. Final Report

Target delivery date – 2/23/01

Report Organization

- Executive Summary
- Introduction - study design, accomplishments, caveats and limitations.
- Strengths, weaknesses, accomplishments, and threats
- "Value-added" benefits of WSCF
- Challenges to operation of WSCF like a commercial laboratory
- Immediate actions
- General Overall Recommendations
- Recommendations to change operating environment
- Recommendations involving limited investments (capital and human resources
- Recommendations involving longer terms or more investment
- Further actions to insure sustained operation

Progress to date

- Completed the plan and organization.
- Reviewed over 100 documents, correspondence and records
- Interviewed 18 individuals or groups (at least once)
- Expended about 4.5 man weeks to date

Progress to date

- The WSCF is a very complex, multi-layered, multi-faceted operation.
- It supplies a mission critical service to Hanford programs.
- It appears to be valued by its major customers.
- It is plagued by the typical challenges and opportunities of commercial laboratories …
- ***… and then some, and then some more.***

Preliminary Findings

Next Steps

- Finish gathering information and interviews.
- Begin to discuss the recommendations and rough out the report.
- Go back and fill any gaps.
- Produce the draft report.
- Consider comments from FHI.
- Finalize report.

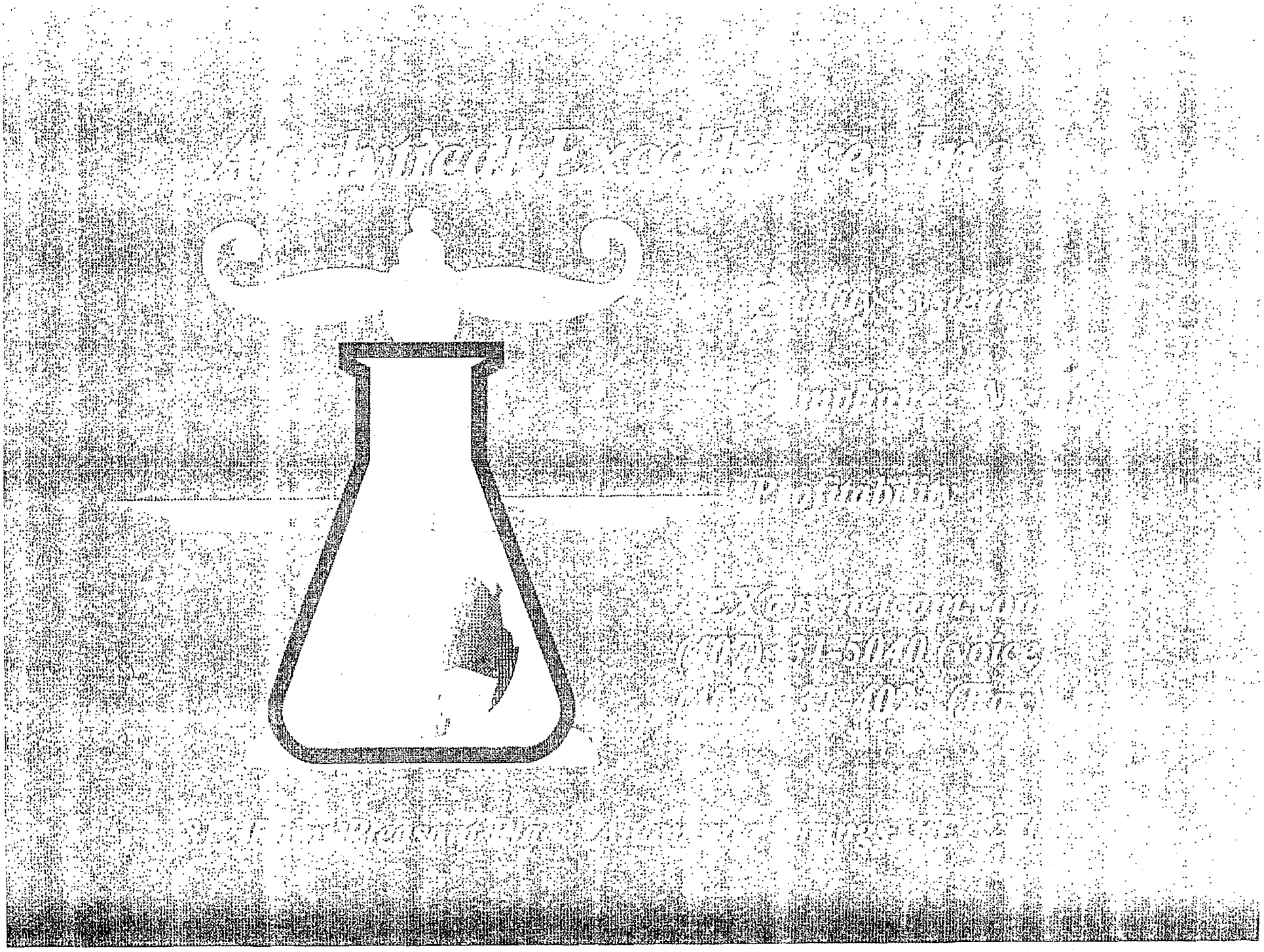


Exhibit D

ENVIRONMENTAL ANALYTICAL LABORATORY MODEL

ENVIRONMENTAL ANALYTICAL LABORATORY MODEL

Product: Chemical, radiochemical analyses of environmental matrices and their reports

Regulatory Support: RCRA. CERCLA, TSCA

Client Base: DOD, DOE, State & Industrial clients

Staff:

Direct Production: 40 (20 chemists, 20 technicians)

Indirect Support: 10 (Lab Manager, 1 Technical/Operations Director, 3 project/customer service managers, 1 (H&S, Radiological Safety Officer, and building maintenance). 1 QA Manager, 1 LIMS/QA assistant, 1 (receptionist, HR and procurement), 1 sales)

Revenue: $5-6 million/year

Cost of Sales: < $5 million/year

Procurement: The laboratory selects a primary vendor for lab supplies that places necessary supplies on consignment at the facility and maintains inventory. Lab pays at time of use and tracks via vendor bar code system and computer usage by department. This is roughly 90% of procurement dollars. Other purchases made by group leaders using credit card or standard purchase order issued by the procurement person. Over $1,000 requires Lab Manager approval. All must be able to defend their costs of operation including purchases. Vendors are approved by QA if quality related item.

Waste Control: The H&S and RSO is responsible for monitoring waste disposal and the sample receiving and organic preparation staff are trained on disposal procedures and manage the disposal at in lab collection points and samples for disposal. A lab of this size would be a large quantity generator and be permitted for all waste types generated.

Health and Safety: Program guided by Chemical Hygiene Plan and H&S procedures including radiochemical procedures. All potential rad samples screened upon receipt and if required handle in controlled area monitored during procedure; wipe samples of area taken by analysts before and after handling.

Maintenance: Preventative and first level instrument maintenance handled by analysts and supported by vendor contracts. The H&S person, who may get help from available staff for preventive and first level maintenance, coordinates building maintenance and uses contract labor for major services.

Facility Size: 20,000 sq. ft. Total with 18,000 sq. ft for laboratory and storage space and 2,000 sq. ft. office and conference area. Lab staff desk space is in the laboratory.

COSTS MODEL FOR THE ABOVE LABORATORY

Item	Cost in $$/Month	% of Costs Per Month
Salaries/wages/benefits	200,000	50%
Facility Lease and Depreciation	25,000	6.25%
Materials and Supplies	40,000	10%
Utilities	30,000	7.5%
Wastes	15,000	3.75%
Depreciation of Equipment	10,000	2.5%
Equipment	10,000	2.5%
Maintenance	20,000	5%
License/Fees	5,000	1.25%
Travel	5,000	1.25%
G & A	25,000	6.25%
Miscellaneous	15,000	3.75%
Total Costs Per Month	400,000	100%

The above-simplified Model can also be compared to data compiled from several commercial environmental laboratories and presented in Table D-1 the costs by line item are presented as a % of sales. The comparable costs noted above fall into the range of values reported by the laboratories in this study (Miller & McConnaghy Environmental Laboratory Business Planning Study Planning Period – 2000)

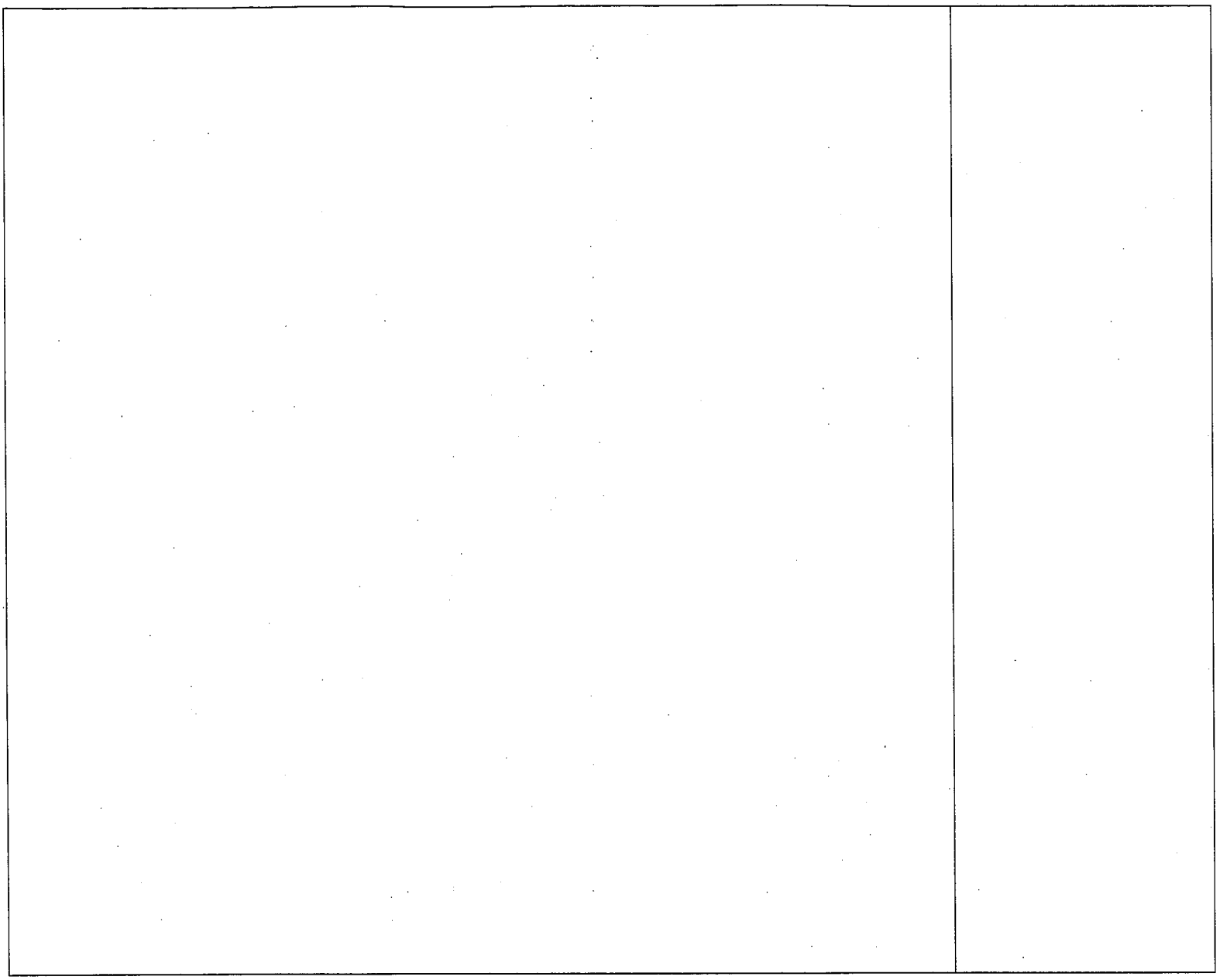
Table D-1 Miller and McConnaghy Study Data

Description	Laboratory Median costs as % of Sales*Verses (%Range for Labs)
Payroll Costs	40.5 (32.7-57)
Gen. & Admin. Expenses	16.0 (5-39)
Equipment Depreciation	4.8 (1.9-9.8)
Expenses for Chemicals, Reagents, Solvents	5.6 (2.1-11)
Expenses for Glassware/Plasticware	1.2 (0.8-2.6)
Expenses for Sampling Containers	2.0 (0.5-4.0)
Expenses for Consumables (cost of pipettors, gloves, electrodes, etc).	2.0 (0.1-7)
Expenses (including lease expense) for Lab Equipment	1.0 (0.1-3.9)
Expenses (including lease expense) for Lab Instrumentation	2.3 (0.2-9)
Expenses (including lease expense) for Lab Furniture/Casework	0.9 (.02-1)
Telephone Expenses	1.0 (0.4-1.8)
Freight Expenses	1.8 (0.4-3)

* In the Case of WSCF total cost could be substituted for Sales

CHPRC Schedule change – need trucks in by 1:00 to package and ready coolers for shipment, must be in town by 2 pm for same day shipment. • Average 3 hours per day x 6 drivers = 18 hours day x192 days = 3456 hours x $75 hour = $259,200	$259,200
Reduced sampling schedule or need to work OT to meet schedule • 20 days OT year x8 hrs =160 hrs x 4 operators 1 FWS= 800 OT hours x $110 hr = $88,000	$88,000
Need more coolers • Estimate 200 x$50 = $10,000	$10,000
Cost of rad analysis prior to shipping (222s Alpha Beta/ GEA) $400 per sample assume 20 coolers a day, max 3 sample sets per cooler = 60 per day x215 days 12,900 per year x $400 = 5,160,000	$5, 160,000
Requires temperature cold while awaiting analysis. Refrigeration/facility modifications	$100,000 ?
Will miss hold times for Cr6 and anions analysis (945 -18702 analysis respectively FY 2013)	Flagged data, DQO impact
Fuel transport to town • $20 per vehicle day x6 = $120 per day x 215 days = $25,800	$25,800
Increased vehicle maintenance • $2000 per vehicle per year = $12,000	$12,000
Increased environmental impact from vehicle emissions,fuel use and transport on DOT roads.	Use of additional fuel, increased C02, Increased risk to public
Additional support at 1162 Shipping Facility • 2 RCT/ 1 Shipper = 3 FTE = $375,000	$375,000
HAZMAT fee per cooler • $30 per cooler (12 to 40 per day) average of 20 coolers day x 215 days= 4300 coolers x$30 = $129,000year	$129,000
Shipping cost per cooler overnight air $1 pound estimate, (if ground transportation needed more expensive) • Average cooler weight 80 lbs = $80 x 3400 coolers = $272,000	$272,000
Cooler return fees • 4300 coolers per year assume $10 per cooler = $43,000	$43,000
¼ FTE to manage coolers	$30,000
Return sample fees from WRPS (222s) if only sent Alpha/Beta/GEA	$70,000 to$100,000??
FTE's to pick up samples at 222s • 2 NCO 1 RCT x 8 hr month =24 hr x 12 =288 hrs x$75 =$43200	$43,200
FTE's NCO/WMR/RCT Waste acceptance package and disposal of returned samples	$100,000 ?
Cost of treatment/disposal of returned samples (16 drums PFNW)	$30,000 ?
Return shipment and disposal of PFNW waste to ERDF	$30,000 ?
MSA Cost of project planning for laboratory shut down	$100,000?
MSA Cost to dispose of equipment (not counting value of equipment paid for by taxpayer dollars)	$200,000?
MSA Cost for Analysis to characterize waste after instrument shutdown	$100,000 ?
MSA cost for shipping samples, HAZMAT fees, shipping fees, coolers, FTEs	$100,000?
MSA Cost to dispose of chemicals (not counting value of tax payer dollars to purchase it)	$200,000 ?
	$125,000?

Unknown:
• Replace 6268 and 6269 facility for equipment cleaning/SGRP
• Cost to other contractors to ship and analyze samples offsite
  ○ 750x400 rad analysis = $300,000
  ○ WRPS sample return disposal $60,000
  ○ 200 coolers x30 Hazmat fee = 6000
  ○ Transportation
  ○ FTEs package, transport, coolers $50,000
• D&D WSCF facilities
• Transporation impacts associated with increased volumes waste Richland/TN
• Loss of 60 jobs, increased unemployment, local economical impact
• 120,000 to 240,000 liters of Hanford samples sent offsite, disposed of under less stringent regulatory requirements (down drain)
	$500,000



Instrument List: WSCF Inorganic Group, Building 6266						
Instrument	Manufacturer	Model No	Property Number Or Serial No	Rm No	Date** Received	Date** Placed in Service
Anions, IC405	Dionex	600 (CD25,GS50,AS50)	WC77591	N3	Jan-02	Jun-02
Ammonia, IC406	Dionex	600 (CD25, EG40, AS50)	WC77592	N3	Jan -02	Mar-02
Anions, IC407	Dionex	600 (CD25, GS50,AS50)	WC88986	N3	Feb-05	Feb-05
Anions, IC408	Dionex, RFIC	ICS-2000/AS	WC94092	N3	Late 2007	Jan-08
Anions, IC 409	Dionex, RFIC	ICS-2000/AS	WC94093	N3	Late 2007	Jan-08
Anions, IC410	Dinex, RFIC	ICS-2000/AS	WF21079	N3	Nov-09	Nov-09
Alkalinity Titrator	Mettler Toledo	T90 Titrator	WF13179	N5	2010	4/2011
Discrete Analyzer	Westco Scientific Instrument, Inc.	Smart Chem	WC94098	N5	2008	Jun-08
Discrete Analyzer	Westco Scientific Instrument, Inc.	Smart Chem	WC90231	N5	11/2009	Installed on 1/19/2010, Production 2/8/2010
Spectrophotometer	Therms Spectronic	NA	3SGG282002	N10 inactive	2005	2005
pH Meter	Thermo	Orion 3 Star		N10		
ICP-MS, 7500	Agilent	7500	WC77922	N12	2003	Jan-04
ICP-MS, 7500ce	Agilent	7500ce	WC90107	N12	2006	Feb-07
Auto Sampler for 7500ce	CETAC	ASX-520	WC90073	N12	2006	Feb-07
Auto Sampler for 7500	CETAC	ASX-520	WC90074	N12	2003	Jan-04
Direct Mercury Analyzer	MileStone Microwave Lab Systems	DMA80	WC90002	N12	2005 (?)	Working, not in production
Alkalinity Titrator	Mettler Toledo	DL28 Titrator	5126383617	N12	2006	11/2006
ICP-AES, Intrepid	Thermal Elemental	Iris Intrepid	WC79600	N16	Dec-02	Mar-03
ICP-AES, XSP	Thermal Electron Corporation	Iris Intrepid II XSP	WC90000	N16	2005	2005

ICP-AES,	Perkin Elmer	Optima, 7300 DV			'10/2010	Not installed yet
Perkin Elmer, FTIR	Perkin Elmer	1600		N18	~1995	~1997
Beryllium Atomic Fluoresence Spectrometer	Berylliant	Promega Glo-MaxR Multi Jr Sinle Tube Multimode Reader		N18	New. '9/2010	Installed in 9/2010
Beryllium Atomic Fluroesence Spectrometer	Berylliant	Promega Glo-Max Multi Jr Single Tube Multimode		N18	New. '9/2010	Installed in 9/2010
Infrared Moisture Determination Balance		FD-720	NA	N22		
pH/Conductivity with printer	Mettler Toledo	SevenMulti	1227357059	N22	2006	2006
pH/Conductivity	Mettler Toledo	SevenMulti	1225202007	N22	2006	2006
Spectrophotometer	Therms Spectronic	NA	3SGF027006	N22	2005	2005
pH/Conductivity with printer	Mettler Toledo	SevenMulti	1232145606	N22	2011	2011

Major Instrument List: WSCF Organic Group

Building 6266

Instrument	Manufacturer	Model No	Property Number 0r service No	Instrument Location	Date** Received	Date** In Placed Service
GC/MS for VOA, VOA-403*, Autosampler	Archon		WC88135	N7	2005	2007 (SUMMER 2006)
GC/MS for VOA, VOA403, with Teledyne Tekmar Stratum Purge and Trap WF 10258 (1/2010)	Tekmar/Agilent	6890N/5973, US10505008	WF10258/WC89033	N7	2006	3/1/2007. Replaced purge & trap on 1/20/2010,
GC/MS for VOA, VOA404*, Autosampler	Archon, Environmental Sample Technology, Inc (EST)		WC90290 Replaced with WF22021	N7	New 2005 (WC90290), WF22021 New in 1/2010. Moved the autosampler WC90290 to FID#401 in 1/2010.	December 2008, replaced purge & trap and autosampler on 1/19/2010
GC/MS for VOA, VOA404, with Teledyne Tekmar Stratum Purge and Trap WF 10257 (1/2010)	Tekmar/ Agilent	6890N/5973, US10325033	WC80559/ WC74167	N7	from WIPP	Fall 2008, qualified on 12/2/08, quick response
Headspace VOA, Headspace Sampler/ GC/FID/ECD , VOA 405	Agilent	Headspace G1888 / 6890N, US 10437002	WC78849/ WC78850	N9	Used	3/2008
GC/PID & FID for gasoline & others*, FID401 (with Teledyne Tekmar Stratum Purge and Trap (WF10259))	HP with Archon, Environmental Sample Technology, Inc (EST)	4560 / 5890II, US10630046	WC 90290 / WF10259 / WC52020	N9	1995	1995. Changed to O-1-Analytical (4560) Purge and trap in Jan 2009. Replaced the autosampler from VOA#404 (WC902990) in 1/2010
GC/FID, FID-406	Agilent	6890N, US10505045	WC90106	N9	2006	2007 on 1/21/2010
GC/FID, FID405	Agilent	6890N	WC89038	N9	Mar-05	2005
GC/ECD;*, ECD-401	Hewlett Packard	5890II	WC41975	N9	1995	1997
GC/ECD;*, ECD-403	Agilent	6890N, US10630037	WC90105	N9	Sep-06	Late 2007
GC/MS, SV-401	Agilent	6890N/5973, US10505007	WC89036/ WC80558	N11	Feb-05	Apr-05
GC/MS, SV-402	Agilent	6890N/5973,	WC89037, US10505009 (GC)	N11	Feb-05	Apr-05

GC/MS, SV-403 AutoSampler	Agilent Agilent	7693 (Autosampler) 6890N/5975B	CN10510052 (Auto) , WC78847/ WC90211	N11	Transfer from Flammable Gas, 2011	SMSIM (new autosampler arrived in 6/2011)
TOX, TOX-401	Thermo Euroglas	TOC1200	WC80571	N13	2004	2004
TOX, TOX-402	Thermo Euroglas	ECS3000	WC80569	N13	2004	2004
TOX, TOX-403	Thermo Euroglas	ECS3000	WC90293	N13	2006	May-09
TOC, TOC-401	Shimadzu	TOC-Vws	H516042 00035	N13	Nov-06	2007
TOC, TOC-402	Shimadzu	TOC-Vws	WC80566	N13	Nov-03	2004
GC/MS, TDU-VOA, Sorbent Tubes, VAP 2	Agilent	6890N/5973	WC74209/WC741 66	N14	2004	2005
GC/MS, VAP#7 2HG1	Entech / HP	G1530A/ 6890A/ HP 5973, 7032A-L	33159/ WC68672/ WC68669	N14		Screening for high concentration vapor
Headspace and Procentrate for VAP#9	Entech	7410 / 7150	na	N14	2011	
GC/MS, VAP#9 for SUMMA	Hewlett Packard	G1540A/ 6890N/5973	US 9313059 / US00030319/ WC66127/ WC66128	N14	2001	Re-configure
HP/GC with autosampler,	Waters	Millipore	WC41851			Not in production
FTIR	Perkin Elmer	1600	WC38799 (Series 147886)	N18	1995	1995
GC/FID, FID-404	Hewlett Packard	5890II	WC48815	N20	1995	1995
GC/MS, TDU-SV	Agilent	5890E/5972	WC41847/ WC50025	Retired	1995	2005 (Out of Service 2009)
GC/MS, VAP#9 for SUMMA	Hewlett Packard	6890N/5973	WC66127/ WC66128	Re-configured	na	na

Instrument List: WSCF Radiochemistry Group

Building 6266, Counting Room

Instrument	Manufacturer	Model No	Property Number 0r Serial No	Instrument Location	Date** Received	Date** Placed in-service	Condition when Received
α/β Counter, ASC#1	Protean	WPC9350	WC48626	Inactive, B2	Jun-94	Sep-94	New
α/β Counter, ASC#2	Protean	WPC9350	WC48627	Inactive, B2	Jun-94	Sep-94	New
α/β Counter, ASC#3	Protean	WPC9350	WC48628	Inactive, B3	Jun-94	Sep-94	New
α/β Counter, ASC#4	Protean	WPC9350	WC48629	B3	Jun-94	Sep-94	New
α/β Counter, ASC#5	Protean	WPC9350	WC48630	Inactive, B2	Jun-94	Sep-94	New
α/β Counter, ASC#6	Protean	WPC9350	WC48625	B3	Jun-94	Sep-94	New
α/β Counter, ASC#7	Protean	WPC9350	WC56507	B3	Jun-94	Sep-94	New
α/β Counter, AB1601	Eurisys	INZO	WC56078	Inactive, B3	Jun-94	Sep-94	New
Liquid Scint. Count, LSC#1	Packard	2550TR	WC48606	B2	Jun-94	Sep-94	New
Liquid Scint. Count, LSC#2	Packard	2550TR	WC48611	B2	Jun-94	Sep-94	New
Liquid Scint. Count, LSC#3	Perkin Elmer	Tri-Carb 3110	WC89124	B2	Feb-08	Not Yet	New
Alpha Energy A. Alpha-1, #1-#8	Ortec, EG&G	401A	WC48612	B2, 4/oos	Jun-94	Sep-94	New
Alpha Energy A. Alpha-2, #9 - #16	Ortec, EG&G	401A	WC48613	B2, 2/oos	Jun-94	Sep-94	New
Alpha Energy A. Alpha-3, #17 - #24	Ortec, EG&G	401A	WC56387	B2, 4/oos	Jun-94	Sep-94	New
Alpha Energy Analyzer #33 - #40	Ortec	Octete/	WC66034	B2, 2/00s	Jun-94	Sep-94	New

Alpha Energy A. Alpha-4, #41 - # 64	Canberra	2100	WC66039	B2, 2/oos	Jun-94	Sep-94	New
GAMMA O	EG&G/Ortec	HPLBS-1-F	695-110	B2	Jun-94	Sep-94	New
GAMMA 1	EG&G/Ortec	LSFD-116	394-107	B2	Jun-94	Sep-94	New
GAMMA 2	EG&G/Ortec	LSFD-116	394-106	B2	Jun-94	Sep-94	New
GAMMA 3	EG&G/Ortec	LSFD-116	394-105	B2	Jun-94	Sep-94	New
GAMMA 4	EG&G/Ortec	LSFD-116	394-104	B2	Jun-94	Sep-94	New
GAMMA 5	Canberra	GC-10020	8943391	B2	Jun-94	Sep-94	New
GAMMA 6	EG&G/Ortec	LSSL-2	394-101	B2	Jun-94	Sep-94	New
GAMMA 7	GAMMA	G-13-35	49401	B2	Jun-94	Sep-94	New
GAMMA 8	Canberra	767	8966411	B2	Jun-94	Sep-94	New
GAMMA 9	EG&G/Ortec	HPLBS-1-F	796-112	Inactive	Jun-94	Sep-94	New
GAMMA 10	EG&G/Ortec	HPLBS-1-F	898-116	B2	Jun-94	Sep-94	New
GPC, D614	Canberra	Tennelec Series 5	WC88190 (0401861-4)	B3	2004	Sep-05	New
GPC, D616	Canberra	Tennelec Series 5	WC88192 (0401861-6)	B3	2004	Sep-05	New
GPC, D615	Canberra	Tennelec Series 5	WC88193 (0401861-5)	B3	2004	Sep-05	New
GPC, D613	Canberra	Tennelec Series 5	WC88194 (0401861-3)	B3	2004	Sep-05	New
GPC, D612	Canberra	Tennelec Series 5	WC88195 (0401861-2)	B3	2004	Sep-05	New

GPC, D611	Canberra	Tennelec Series 5	WC88196 (0401861-1)	B3	2004	Sep-05	New
GPC, D934	Canberra	Tennelec Series 5	WC66045 (42394)	B3	2004	Sep-05	New
GPC #236	Protean	Pic 9550	WC95778	B3	6/2009	8/2010	New
GPC #235	Protean	Pic 9550	WC95779	B3	6/2009	8/2010	New
GPC #234	Protean	Pic 650	WC95780	B3	6/2009	1/2011	New
AEA (30 chambers) with a new Operating system #65 -#96	Canberra	Alpha Analyst	WF23494	B2	10/2010	Not yet	New
Alpha Energy Analyzer, #25 - #27	Ortec	401A	WA-14300	B2, 2/oos	Jun-94	Sep-94	New