RAS 12942

DOCKETED
USNRC

January 24, 2007 (3:47pm)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	Docket No. 40-8838-MLA
U.S.ARMY	)	ASLBP No. 00-776-04-MLA
(Jefferson Proving Ground Site)	)	January 24, 2007

ARMY'S DISCLOSURES PURSUANT TO 10 CFR § 2.336

Pursuant to 10 CFR § 2.336 as modified by the Order pertaining thereto entered herein on January 16, 2007, the United States Army (Army or Licensee) provides the following initial general discovery in this proceeding:

(a) (1) The name, the address and telephone number of each person, including any expert, upon whose opinion the Army bases its response to Save The Valley's (STV's) claims and contentions and upon which the Army may rely as a witness, and a copy of the analysis or other authority upon which that person bases his or her opinion:

Principal Witnesses

Harold W. Anagnostopoulos
Science Applications International Corporation (SAIC)
Radiation Safety Officer (RSO)
8421 St. John Industrial Dr, Suite 200
St. Louis, Missouri 63114

Phone: 314-770-3059 or 314-393-9776
Fax: 314-770-3067
Email: harold.w.anagnostopoulos@saic.com

Analysis and opinions below.
Resumé attached.

Michael L. Barta
Science Applications International Corporation (SAIC)

TEMPLATE = SECY-035

SECY-02

Deputy Project Manager/Lead Risk Assessor
1634 Carr Avenue
Memphis, Tennessee 38104-5010

Phone: 901-722-5504; Fax: 901-722-5505
Email: michael.l.barta@saic.com

Analysis and opinions below.
Resumé attached.

Todd D. Eaby
Science Applications International Corporation (SAIC)
Hydrogeology and Multimedia Sampling and Analysis Lead
6310 Allentown Boulevard
Harrisburg, Pennsylvania 17112

Phone: 717-901-8823; Fax: 717-901-8103
Email: todd.d.eaby@saic.com

Analysis and opinions below.
Resumé attached.

Corinne M. Shia
Senior Program Manager
Alion Science and Technology, Corp.
Independent Technical Reviewer
3975 Fair Ridge Drive, Suite 125 South
Fairfax, VA 22033

Phone: 703-259-5147; Fax: 703-259-5212
Email: cshia@alionscience.com

Analysis and opinions below.
Resumé attached.

Joseph N. Skibinski
Science Applications International Corporation (SAIC)
Project Manager
11251 Roger Bacon Drive

Reston, Virginia 20190

Phone: 703-810-8994; Fax: 703-709-1042
Email: joseph.n.skibinski@saic.com

Analysis and opinions below.
Resumé attached.

Stephen M. Snyder
Science Applications International Corporation (SAIC)
Senior Geologist
6310 Allentown Boulevard
Harrisburg, Pennsylvania 17112

Phone: 717-901-8840; Fax: 717-901-8102
Email: stephen.m.snyder@saic.com

Analysis and opinions below.
Resumé attached.

Paul Cloud
JPG Site Radiation Safety Officer
Department of the Army, Civilian Employee
c/o Frederick P. Kopp
U.S. Army Garrison - Rock Island Arsenal
Office of Counsel (AMSTA-RI-GC)
One Rock Island Arsenal Place
Rock Island, IL 61299-5000

Phone: 309-782-7951; Fax: 309-782-3475
Email: koppf@ria.army.mil

Would testify, if necessary, as to facts and history of site

Joyce Kuykendahl
Former JPG Site Radiation Safety Officer
Department of the Army, Civilian Employee
c/o Frederick P. Kopp
U.S. Army Garrison - Rock Island Arsenal
Office of Counsel (AMSTA-RI-GC)
One Rock Island Arsenal Place
Rock Island, IL 61299-5000

Phone: 309-782-7951; Fax: 309-782-3475

Email: koppf@ria.army.mil

Would testify, if necessary, as to facts and history of site

Backup and/or Potential Rebuttal Witnesses

Seth T. Stephenson
UXO Expert
Science Applications International Corporation (SAIC)
Field Manager/Senior UXO Supervisor
175 Suburban Street
Danville, Indiana 46122

Phone: 765-278-3520; Fax: 765-245-5980
Email: seth.t.stephenson@saic.com

William C. Evers (Clark)
Backup for Harold W. Anagnostopoulos
For Radiation Issues
Science Applications International Corporation (SAIC)
Senior Health Physics Technician (HPT)
8421 St. John Industrial Dr, Suite 200
St. Louis, Missouri 63114

Phone: 314-770-3006; Fax: 314-770-3067
Email: william.c.evers@saic.com

Randy C. Hansen
Project Health and Safety Officer
Science Applications International Corporation (SAIC)
Health and Safety Officer
8421 St. John Industrial Dr, Suite 200
St. Louis, Mo 63114

Phone: 314-770-3027; Fax: 314-770-3067
Email: randy.c.hansen@saic.com

Richard A. Hoover
Lead Geologist, Electro-imaging
Science Applications International Corporation (SAIC)
Project Geophysics Manager

6310 Allentown Boulevard
Harrisburg, Pennsylvania 17112

Phone: 717-901-8835; Fax: 717-901-8103
Email: richard.a.hoover@saic.com

Charles L. Klinger
Soil Scientist, Lead on Soil Verification Survey
Science Applications International Corporation (SAIC)
Project Soil Scientist
6310 Allentown Boulevard
Harrisburg, Pennsylvania 17112

Phone: 717-901-8805; Fax: 717-901-8102
Email: charles.l.klinger@saic.com

Joseph E. Peters
In Charge of Quality Control and Analytic Sampling
Science Applications International Corporation (SAIC)
Quality Control Manager
11251 Roger Bacon Drive
Reston, Virginia 20190

Phone: 703-318-4763; Fax: 703-709-1042
Email: joseph.e.peters@saic.com

Ernest J Schultheis (Joe)
Registered Indiana Geologist
Science Applications International Corporation (SAIC)
Geology Technical Reviewer
4031 Colonel Glenn Highway
Beavercreek, Oh 45431-1601

Phone: 937-431-2242; Fax: 937-431-2288
Email: ernest.j.schultheis@saic.com

Heather M. Thorn
Backup to Michael L. Bart for Environmental and Ecological Risk
and Ecological Sampling Issues
Science Applications International Corporation (SAIC)
Ecological Risk Assessor
11251 Roger Bacon Drive

Reston, Virginia 20190

Phone: 703-318-4575; Fax: 703-709-1042
Email: mcintoshh@saic.com

Knut Torgerson
Backup for GIS (Geographic Information Systems) Issues
Science Applications International Corporation (SAIC)
Data and Geographic Information Systems (GIS) Manager
11251 Roger Bacon Drive
Reston, Virginia 20190

Phone: 703-810-8985; Fax: 703-709-1042
Email: knut.e.torgerson@saic.com

Jeffrey J. Warren
Backup on Electro-imaging Issues
Science Applications International Corporation (SAIC)
Geophysics Field Supervisor
6310 Allentown Boulevard
Harrisburg, Pennsylvania 17112

Phone: 717-901-8828; Fax: 717-901-8102
Email: jeffrey.j.warren@saic.com

Resumés mentioned above are on the accompanying CD. Resumés for the remaining listed witnesses will be provided to the parties when received by the Army.

Analysis/Opinions and Authorities

The following named persons, from the list above, are expected by the Army to be its expert witnesses in this matter. Below, a synopsis of the respective analysis and/or opinions of each is set forth immediately following the STV basis to which it applies:

STV'S CONTENTION B-1: *AS FILED, THE FSP IS NOT PROPERLY DESIGNED TO OBTAIN ALL OF THE VERIFIABLE DATA REQUIRED FOR RELIABLE DOSE MODELING AND ACCURATE ASESSMENT OF THE EFFECTS ON EXPOSURE PATHWAYS OF METEOROLOGICAL, GEOLOGICAL, HYDROLOGICAL, ANIMAL, AND HUMAN FEATURES SPECIFIC TO THE JPG SITE AND ITS SURROUNDING AREA.*

*[**The following basis was originally listed as a basis in support of Contention A-1, thus the reference to the ERMP, but was accepted by the Board as more properly applying to Contention B-1:** **d. Basis.** The aquifer underlying the JPG site is not sufficiently characterized to demonstrate its extent and gradient – as the Army itself has previously conceded. See Regional Range Study, Section 6.5.2.3.2, Hydrogeology, at 35 ("Monitoring wells near and within the Delta Impact Area south of Big Creek are too widely spaced to construct a meaningful ground-water elevation contour map.") The ERMP should acknowledge and address this critical fact.]*

Army Witness: Corinne M. Shia – Subject: Modified ERMP

Analysis or Opinion of Army Witness: The ERMP will be revised after completion of site characterization activities to reflect the then current understanding of the site hydrogeology.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis A-1, d:
No references.

Contention B-1, Basis a. *The EI geophysical study which will follow the fracture analysis study, as described in section 6.1 of the FSP, is supposed to find all significant karst features and location of the water table. From these studies, 10 to 20 pairs of monitoring wells are proposed to attempt to tie into "conduits" of ground water flow. This study may help to site monitoring wells, but stream gauging studies should be an early and integral part of the search for likely conduits. The stream reaches of strong gain would be a very strong direct indicator of the discharge points of ground water "conduits." EI is an indirect technique and can miss conduits or identify features that are not conduits. The FSP alludes to doing stream gauging in its discussion of well location criteria, but the time table shown indicates stream studies will follow the ground water studies by a year.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Stream Gauging Study

Analysis or Opinion of Army Witnesses: The stream and cave gauging proposed in the FSP will develop an understanding of the hydrologic cycle or water budget at JPG. Specifically, the responses of the water basin to precipitation, i.e., the proportion of precipitation water that runs off on the surface versus infiltrates the ground surface, would be determined. The proposed stage-gauging stations would be operated continuously and data recorded by an electronic data logger connected to a pressure transducer. The stations will be calibrated by collecting manual stream/cave stream flows and combining with the stage data to develop a flow curve for each station. The continuous recording of stream stages will be completed through low-, mid-, and high-flow periods. This surface water information will be compared to continuous water level recordings in the wells to be installed after the EI Survey. In this manner, responses of the streams, cave streams, and groundwater to precipitation can be observed, and components of the hydrologic budget

can be separated and quantified. The stream and cave stream gauging stations were installed in September 2006 and consist of three continuously recording stage gauges along Big Creek and four along Middle Fork Creek, two continuously recording stage gauges at cave streams along Big Creek and one visual stage gauge along the northern tributary of Big Creek. An existing automatic recording weather station located at JPG is being used to provide precipitation records. Simultaneous records of precipitation, groundwater levels, and streams will still be required to accomplish the proposed task originally scoped.

The type of stream gauging that the STV recommends was not proposed in the FSP and would require a much different and additional level of effort than what was proposed. This type of gauging does not involve installation of automatic and continuous stage-recording stations, but consists of teams manually collecting flow measurements along the course of the stream and at cave streams and springs using current meters. Information gathered during this type of gauging could be evaluated and possibly assist in the identification or validation of the locations of groundwater discharges to surface water, or losses of surface water to the groundwater, which often occurs at fracture trace intersections. The information gained could be a factor in selecting surface water and sediment sample locations. If the manual stream gauging were to be completed, Fracture Trace Analysis results should be used to better design the manual surface water-gauging task (frequency and locations of gauging stations relative to identified fracture trace intersections with creeks). The Army considers the need for this type and level of effort of stream and cave gauging to be not necessary for selecting well locations.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis a:

Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ; pp. 205-207.
http://www.amazon.com/gp/offer-listing/0133653129/sr=1-1/qid=1169483519/ref=pd_bbs_olp_1/002-2096893-9724839?ie=UTF8&s=books

Fetter, C.W. 1988. Applied Hydrogeology, Second Edition. Merrill Publishing Company, Columbus, Ohio; pp. 41-54
http://www.amazon.com/gp/offer-listing/0130882399/sr=1-1/qid=1169483756/ref=pd_bbs_sr_olp_1/002-2096893-9724839?ie=UTF8&s=books
(fourth edition, Second Edition in Harrisburg Office)

USGS (U.S. Geological Survey). 2005. *Estimates of Ground-water Recharge Based on Streamflow-Hydrograph Methods: Pennsylvania:* Open-File Report 2005-1333.
www.USGS.gov

Maidment, David R. Editor in Chief, Handbook of Hydrology, McGraw-Hill, Inc, 1993;pp. 8.22-8.25.

http://www.amazon.com/gp/offer-listing/0070397325/sr=1-1/qid=1169484048/ref=pd_bbs_sr_olp_1/002-2096893-9724839?ie=UTF8&s=books

Lattman, L.H., and R.R. Parizek, 1964, "Relationship Between Fracture-Traces and the Occurrence of Groundwater In Carbonate Rocks," Journal of Hydrology, Vol. 2, pp.73-91.
(Copy in Harrisburg SAIC Office)

Contention B-1, Basis b. *The discussion in section 6.2.1 is disturbing in its failure to set out the chemistry of the monitoring system at this stage and its cavalier dismissal of ground water as a direct exposure route to humans due to its supposedly "poor quality." The "poor quality" that is being cited is, in part, a function of existing data being sampled from wells that are definitely not in "conduits" that would presumably flush frequently and carry good water. Instead, the "poor quality" data are drawn often from tight, clayey wells and wells that may well have had multiple types of contaminating material falling into them due to poor maintenance.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Poor Water Quality

Analysis or Opinion of Army Witnesses: The Draft Final RI (Montgomery Watson, 2002) provides the details on the basis for the conclusion that the groundwater is of poor quality and low productivity and would be marginal as a potable water source. Furthermore, the potential for direct exposure of humans to impacted groundwater is unlikely, as this report indicates, given that there are few wells in the vicinity of JPG that are used for domestic water supplies and that there was only one well identified within 1 mile down gradient from the area south of the Firing Line at JPG. Therefore, based on available information, these are reasonable statements.

The current FSP defined for groundwater sampling does not currently specify analysis of parameters to indicate groundwater quality (e.g., total dissolved solids, sodium, sulfate, iron, etc.); however, the Army will update the FSP via an addendum to specify these analyses and other cations and anions. More detailed information on groundwater sampling will be contained in FSP addenda.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis b:
Draft Final RI (Montgomery Watson, 2002)

Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ, pp.154-157

Contention B-1, Basis c. *The wells to be used for staging should not be limited by assumption to six wells, as proposed in section 6.2.2. Six may be enough, but it also may not be. The actual number should be a function of results achieved, not assumptions made. (It is hoped that the last sentence in this section mistakenly left an "s" off the word "well."*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Number of Wells

Analysis or Opinion of Army Witnesses: The number of wells at this point in time was estimated to support program planning, schedule, and budgeting and will be revised, as appropriate, when additional information becomes available. Finally, the word "well" in the last sentence of Section 6.2.2 should be revised to "wells."

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis c:
No references.

Contention b-1, Basis d. *The FSP specifies in section 6.2.4 that the "conduit" wells will be paired, but does not describe or explain the reason(s) for the relative positions of the two wells at each well site. Presumably, the objective is to provide a means of measuring vertical gradients at each site, but that is not explained or discussed. Nor is there an indication of whether the "paired" well will be above or below the "conduit" well or whether that relative position would change depending upon unspecified geologic or hydrogeologic conditions.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Non-Conduit Wells

Analysis or Opinion of Army Witnesses: The assumption is correct that the paired wells will be open to the aquifer at different vertical positions. Conduits may vary significantly from a continuous, vertically connected feature hundreds of feet deep to a very small feature only tens of feet high (or there could be highly transmissive "conduits" separated vertically by less transmissive zones). Based on the electrical image results, the well pair will be designed to sample two depths within the selected location to characterize the conduit. If a deep, continuous zone is indicated by the electrical imaging, the two wells will be distributed vertically to best represent the flow in the entire zone. If separate vertical zones are apparent, the pair will be positioned to monitor each zone. If only one zone is indicated by the electrical imaging, one well will be screened in the permeable zone, while the second well will be screened either above or below the permeable zone, depending on the depth of the overburden and the permeable zone.

The well pair design will be subject to modification based on the drilling results. To the extent that drilling information enhances the understanding of the subsurface and the

distribution of permeable zones, well design will be modified to achieve a best representation of the flow characteristics of the aquifer and conduit feature.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis d:
Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ, pp.154-157

Contention B-1, Basis e. *The FSP also specifies in section 6.2.4.3 that a boring that does not produce enough water for a well will be abandoned. If lack of production occurs because the system is "tight" (i.e., impermeable), that makes some sense. However, the nature of karst terrain is such that conduits may not produce water because the flow is highly transient and, unless there is a new flow event at the time of drilling and/or testing, a well may be dry even though it has been placed in an appropriate and important location. To ensure the problem is a temporary lack of water, rather than a permanent lack of permeability, it is necessary to monitor the boring for enough time to be sure it never produces before abandoning it.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Dry Well Abandonment

Analysis or Opinion of Army Witnesses: The intent is to install wells below the water table and not to build dry wells inside caves that occasionally flood. The portion of groundwater run-off that discharges through caves that occur above the water table will be assessed by monitoring and sampling stream and cave stream flows.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis e:
No references.

Contention B-1, Basis f. *The FSP states in section 6.2 that all new wells to be completed will be in "conduit" settings in bedrock. This placement is too limited. Certainly, most off-site transport is likely to occur through bedrock karst features. But, the projectiles and the DU reside in the till and/or the weathered bedrock/colluvium. Simply because good, shallow wells were not completed in the original set of JPG wells does not mean that properly located and completed shallow wells are unnecessary to characterize properly the hydrogeology of the site. Such wells should be included in the FSP.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Colluvium Wells

Analysis or Opinion of Army Witnesses: The FSP will be modified (via addenda) indicating that if significant water-bearing materials are present above the bedrock, then

wells may be constructed with screened intervals above the bedrock. Note that the majority of groundwater flow and the potential for migration of DU to receptors are anticipated to be the greatest within the bedrock conduits.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis f:

Fetter, C.W. 1988. Applied Hydrogeology, Second Edition. Merrill Publishing Company, Columbus, Ohio; pp. 285-295.

Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ pp. 513-514.

Contention B-1, Basis g. *The FSP states in section 6.2.4.4 that the new wells will not be tested for permeability. Granted, if a particular well is sunk into a well-developed conduit, it will not be feasible to measure permeability. But, the nature of karst features is to be hard to locate precisely, so it is likely that at least some of the wells will simply be in bedrock with some enhanced permeability, which should be measured if it can be. Moreover, the conductivity of the rock adjacent to and feeding the conduit is a major determinant of flow through the system. The same holds true for aquifer testing. If pumping the aquifer shows interconnection among two or more of these conduit pairs, that result will provide very valuable information about the system transporting DU from the site, so it should be determined and reported when it occurs.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Permeability Testing

Analysis or Opinion of Army Witnesses: The FSP specifically states that "No aquifer testing is scheduled at this time to be conducted during this investigation." The February 2006 response to RAI #2 described the phased approach to the investigation including the consideration of aquifer testing following the installation of the monitoring network and the collection of basic information and data on the aquifer system. STV is speculating that the proposed wells will be installed within areas that have conditions that can be tested with simple methods (e.g., slug testing) for estimating hydraulic conductivities. The proposed well locations are being developed to intersect karst conduits and/or fractures and by nature are anticipated to have hydraulic conductivities that are greater than that can be reasonably measured with simple testing methods so that required basic information needs to be collected prior to designing and proposing a plan for aquifer testing at these proposed wells and of the monitoring network.

Proposing aquifer and well testing without additional basic site specific data as suggested by STV would most likely result in a waste of time, effort and money as well as collecting useless data for the purpose of site characterization and modeling. It is more appropriate and efficient to have consideration and design of applicable well and/or aquifer testing following the collection of basic monitoring location specific data during well installation and the following monitoring as the Army has proposed in the

FSP and previous RAI responses. This phased approach of basic data collection followed by consideration of and design of aquifer testing would more likely result in appropriate and useful aquifer testing and aquifer specific data that could be used for site modeling and characterization.

Slug testing of wells is generally not useful in this hydrogeologic environment. Connectivity of the aquifer is important, and this information is obtained from drilling information and water level monitoring. Aquifer testing, in the form of a long-term (multi-day) pumping test on one or more specially constructed wells may be useful, and will be planned in the future, as the site conceptual model is developed.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis g:

Kruseman, G.P. and de Ridder, N.A. 1990. Analysis and Evaluation of Pumping Test Data, Second Edition. International Institute For Land Reclamation and Improvement, The Netherlands; pp 237-247.
http://www.amazon.com/gp/offer-listing/9070754207/sr=1-1/qid=1169484327/ref=pd_bbs_sr_olp_1/002-2096893-9724839?ie=UTF8&s=books

Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ; pp.154-157

Contention B-1, Basis h. *Contrary to section 6.2.4.3, geophysical testing and video taping of all of the well drilling should be required in intervals where it is physically possible. The understanding obtained from cuttings, particularly air-drilled cuttings, what material has been drilled through and in which a well is being completed is extremely limited. Logging and videoing the borings as they are being drilled actually records what the boring encountered and provides much valuable information for reasonably interpreting the water data that is later collected over time. If turbidity precludes video taping of a boring, teleview logging is a valuable alternative. Where boring logs cannot safely be run, logging through the casing can and should be done.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Borehole Geophysical Testing, Logging, and Videoing

Analysis or Opinion of Army Witnesses: The Army does not recommend geophysical borehole logging and/or borehole video at this time. The Army acknowledges that geophysical and video logging can be useful, but dismisses it as impractical due to potential drilling conditions.

The Army's contractor has used the proposed method of fracture trace analysis, electrical imaging (EI) survey, and the drilling method of continuous casing advancement at numerous sites in karst aquifers to find groundwater flow conduits. In tight bedrock with secondary porosity (i.e., fractures, karst conduits), it is necessary to characterize the areas

of increased permeability for characterization of groundwater flow and contaminant transport. The Army's contractor has demonstrated numerous times at several karst aquifer sites that this method, when properly executed, results in the successful characterization of a site such as at JPG. The Fracture Trace Analysis and EI survey are used to locate these areas of probable secondary porosity (conduits) and identify drilling locations for wells to be constructed within the conduits. An experienced rig geologist is able to accurately log, characterize the recovered rock core and split spoon samples, and use drill penetration rates and drilling fluid loss zones to (1) support interpretation of subsurface conditions and (2) properly direct the construction and design of the wells such that the most connected sections of the well to the aquifer are monitored.

These conduit features, which present very difficult drilling conditions (weathered and fractured rock), often result in unstable subsurface conditions. These conduit features present the most probable locations and pathways for significant and often high-volume and velocity groundwater flow; therefore, it is critical that monitoring wells are installed within these features so that they can be monitored and characterized. Because of the difficult drilling conditions, non-typical drilling methods consisting of continuous casing advancement systems (i.e., Odex®, Stadex®, etc.) have been found to be most successful at overcoming and mitigating the unique and highly variable drilling conditions. In order to address concerns of disturbing UXO with the use of an air-rotary drilling rig, SAIC has selected to use a less disruptive drilling method consisting of PQ diamond coring with a simultaneous casing advancement system.

Most geophysical logging methods and video logging of the wells cannot be conducted using these drilling techniques because logging requires an open borehole. The geophysical methods that can be completed through steel casing will provide no additional useful aquifer information that is not able to be determined by the rig geologist's observations. The drilling method proposed will have steel casing advanced in the borehole simultaneously while drilling. To complete the recommended logging method, alternate drilling methods would have to be applied. Previous attempts at advancing boreholes into the identified features using methods other than continuous casing advancement have resulted in lost or broken tooling, unstable boreholes, and borehole collapse/loss. If an alternate method were proposed, borehole collapse and muddy conditions would result in incomplete geophysical/video data. Down hole video and geophysical tooling are very expensive (from $1000s to tens of $1000s), and most operators would not be willing to risk their equipment in known unstable boreholes. If drilling conditions are found to be more stable, future drilling programs may use a different method, at which time logging of the open hole would be evaluated.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis h:

Freeze, Allan R., Cherry, John A. 1979. Groundwater. Prentice-Hall, Inc., Englewood Cliffs, NJ; pp.154-157

Fetter, C.W. 1988. Applied Hydrogeology, Second Edition. Merrill Publishing

Company, Columbus, Ohio; pp. 285-295.

SAIC 2007. FSP Addendum 4

Contention B-1, Basis i. *Specifying the exact number and precise locations of the surface water sampling and gauging points at the outset of FSP implementation, as proposed in section 6.4.1, is not acceptable practice. Until the analysis of ground water data shows where to look for discharges and the discharges confirmed by inspection, such points cannot be reasonably selected. There is no scientific reason why the locations for surface water sampling and sediment sampling need to be the same locations. Each medium should be sampled at locations that are appropriate for that medium. Sediment buildup has nothing to do with the location of base flow connections between ground and surface water. Similarly, the FSP concept in section 6.4.2 of installing only five gauging stations, which are all sited before the ground water system is better understood, is both too limited in the number and may well be counter productive in the locations of the stations.*

Army Witnesses: Todd D. Eaby and Stephen M. Snyder – Subject: Surface Water/Sediment Sampling Locations

Analysis or Opinion of Army Witnesses: The proposed number and location of surface water and sediment sampling points were used to support program planning, scheduling, and budgeting. The precise sampling locations have not been finalized; the locations listed in the FSP are general locations based on the flow into, through, and out of the area of investigation. As stated in Sections 6.4.1 and 6.6.1.1 of the FSP, the sample locations will be revised based on ongoing investigation activities, such as soil verification, surface soils characterization, locations of physical features (e.g., caves, fracture traces, etc.), and results of hydrogeologic investigations. Through the course of surface sampling and gamma walkover surveys, additional surface water drainage ways and areas of erosion (sediment transport) may be identified and proposed for additional sediment and surface water sampling locations.

The stream and cave gauging proposed in the FSP will develop an understanding of the hydrologic cycle or water budget at JPG. Specifically, the responses of the water basin to precipitation, i.e., the proportion of precipitation water that runs off on the surface versus infiltrates the ground surface, would be determined. The proposed stage-gauging stations would be operated continuously and data recorded by an electronic data logger connected to a pressure transducer. The stations will be calibrated by collecting manual stream/cave stream flows and combining with the stage data to develop a stage-discharge rating curve for each station. The continuous recording of stream stages will be completed through low-, mid-, and high-flow periods. This surface water information will be compared to continuous water level recordings in the wells to be installed after the EI Survey. In this manner, responses of the streams, cave streams, and groundwater to precipitation can be observed, and components of the hydrologic budget can be separated and quantified. The

stream and cave stream gauging stations were installed in September 2006 and consist of three continuously recording stage gauges along Big Creek and four along Middle Fork Creek, two continuously recording stage gauges at cave streams along Big Creek and one visual stage gauge along the northern tributary of Big Creek. An existing automatic recording weather station located at JPG is being used to provide precipitation records. Simultaneous records of precipitation, groundwater levels, and streams will still be required to accomplish the proposed task originally scoped.

The majority of the proposed stream-gauging stations were located at existing bridges or culverts on the streams in close proximity to the DU Impact Area, and at known cave streams within the area of study. One gauging station location on Big Creek is located in the vicinity of the eastern DU Impact Area boundary. These are locations where the gauging stations could be established cost-effectively and safely. The gauging stations should provide the data to fulfill that purpose, but the acquired data will be evaluated to determine if additional gauging may be necessary.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witnesses As To Basis i:

Maidment, David R. Editor in Chief, Handbook of Hydrology, McGraw-Hill, Inc, 1993; pp. 8.22-8.25.

USGS (U.S. Geological Survey). 2005. *Estimates of Ground-water Recharge Based on Streamflow-Hydrograph Methods: Pennsylvania:* Open-File Report 2005-1333.

Contention B-1, Basis j. *The entire Kd exercise described in section 2.3.4.3 is inaccurate, unreliable, and, particularly when it forms such a key element of the modeling, rife with opportunities for abuse. It is described in the FSP text as "an important input parameter" for the results of exposure calculations. But, the exercise does not yield a real number and its functionality is based upon assumptions that are known to be invalid. The biggest erroneous assumption is the one spelled out in the text: "the underlying assumption is that rapid equilibrium is reached between the dissolved and sorbed concentrations of a chemical species, and that these two concentrations are linearly related through the Kd factor." At best, there are an infinite number of Kd values based upon the infinite number of combinations of soil types, sorbent contents, ground water compositions and oxidation states that may exist along the flow path from any individual DU projectile. USEPA tried to use the Kd approach in its modeling for solid wastes, and only recently completed spending almost five years to find an alternative way because Kds just do not work. They do not even work for such simple, monovalent contaminants as lead or cadmium; it is preposterous to rely on the Kd approach for something that is so pH-Eh dependent as the uranium system. Field observations should be used to calibrate geochemical modeling with a program on a par with Geochemist's Workbench, with a lot of soil analyses to identify the abundances of sorbents in the soil that will control the mobility of the uranium. And, if the exposure program that SAIC is using requires the Kd approach, it should also be replaced with one that has more sophistication.*

Army Witness: Joseph N. Skibinski – Subject: Kd Study

Analysis or Opinion of Army Witness: The K_d approach for determination of radionuclide distribution coefficients specific to site conditions is supported and recommended by the NRC. Should the NRC propose an alternate method, the Army will address this alternative, as well as an evaluation of cost and schedule impacts. The distribution coefficient can be a critical parameter in assessing the impact from radioactive contamination in soil.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis j:

NRC. 2003. Consolidated NMSS Decommissioning Guidance Decommissioning Process for Materials Licensees. Final Report. NUREG-1757, Vol. 1, Rev. 1.

U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC 20555-0001. September.

EPA. 1999. Understanding Variation In Partition Coefficient, Kd, Values. Volume I: The Kd Model, Methods of Measurement, and Application of Chemical Reaction Codes. Volume II: Review of Geochemistry and Available Kd Values for Cadmium, Cesium, Chromium, Lead, Plutonium, Radon, Strontium, Thorium, Tritium (3H), and Uranium. U.S. Environmental Protection Agency, Washington, DC 20460. August.

DOE. 2001. User's Manual for RESRAD Version 6. U.S. Department of Energy, Argonne National Laboratory, Environmental Assessment Division. July.

Chen, J.P. And Yiacoumi, S. 2002. Modeling Of Depleted Uranium Transport In Subsurface Systems. Water, Air, and Soil Pollution. 140: 173–201, 2002. © 2002 Kluwer Academic Publishers. Printed in the Netherlands.

Contention B-1, Basis k. *The FSP lacks any plan for analysis of penetrators for transuranics such as plutonium, americium, technetium and neptunium or other impurities such as uranium-236. Table 4-1, p. 4-3 of the FSP indicates that 24 penetrators will be collected to establish a "corrosion/dissolution rate." However, there is no mention in the plan to assay the rounds for these other elements. This failure was challenged in previous Army plans by the NRC Staff (Sept. 27, 2001) and ATSDR (Oct. 30, 2002), but has not been corrected in the FSP.*

Army Witness: Harold W. Anagnostopoulos – Subject: Transuranics

Analysis or Opinion of Army Witness: The Army does not plan to analyze penetrators for transuranics based on the low activity level in penetrators, slow degradation rates, and potentially low contribution of TRUs to the total annual exposure.

The Army validated its conclusions through a top-level analysis of the potential exposure of a human receptor to one transuranic, plutonium, from a DU penetrator. From this very brief evaluation, the plutonium activity present in a DU penetrator is estimated to have a negligible impact on the annual exposure (see **Attachment 1**).

The U.S. DoD, U.S. DOE, World Health Organization (WHO), United Nations Environment Programme (UNEP), etc., all indicate that, if present in a DU penetrator, the contribution of TRU in DU contamination to exposure is approximately 0.8% of the total exposure. In a February 2001 press release, UNEP states that the content of TRU found in contamination associated with DU penetrators is "very low and does not have any significant impact on overall radioactivity." An earlier report (January 2001) also states the "content of U236 in depleted uranium is so small that the radio-toxicity is not changed compared to DU without U236." This contention is not relevant or germane to the Army's request for an alternate decommissioning schedule.

These reports also provide degradation rates for uranium metal in the environment – with a lifetime for a 1-kg piece of U metal ground into 1 gram pieces of 400 years in a humid environment – a solid DU penetrator with a mass of 1.3 kg has a lifetime of 2,100 years – and a 300 g penetrator has a lifetime of 500 years. The WHO report on penetrators found in Kosovo states "the rate of corrosion of uranium metal in the environment is slow...Consequently, it is regarded as unlikely that the penetrators will degrade quickly once in the environment and hence will only contribute a very slow leaching of uranium into the environment."

Attachment 1. Potential Human Exposure to Transuranics (TRUs): Case Study for Plutonium

Calculation of the exposure due to the potential presence of transuranic activity in depleted uranium (DU) penetrators (back of the envelope or detailed) is difficult without an estimate of TRU activity or activity fractions. To complete this analysis, existing data were reviewed and a rough estimate performed to provide a general indication of the potential risks to humans.

A report published by the United Nations Environment Programme (UNEP), *Depleted Uranium in Kosovo, Post-Conflict Environmental Assessment*, dated November, 2000, provides analytical results for 4 retrieved penetrators, with Pu-239/240 activities ranging from < 0.8 to 12.87 Bq per kg penetrator mass. The report indicated that most results were less than the established detection sensitivity.

To provide a very conservative evaluation of the potential impact of Pu-239/240 on the overall exposure resulting from DU penetrators at JPG, the upper value of 12.87 Bq/kg was used.

DATA

12.87 Bq/kg = 3.48E-7 μCi/g = 0.348 nCi/g Pu-239/240

DU specific activity ~ 3.6E-7 Ci/g (3.6E-1 μCi/g)

U-238, U-235 and U-234 isotopic abundances are 99.8%, 0.2% and 0.0007%, respectively.

Therefore, the Pu-239/240 activity fraction compared to total activity in a DU penetrator is 9.7E-7 or 0.0001%. Similarly, the Pu-239/240 activity fraction compared to U-238 in a DU penetrator is 1.1E-6, also 0.0001% since U-238 constitutes a majority of the activity in DU.

EXPOSURE CALCULATION

Although the World Health Organization (WHO) has published several reports indicating that the TRU activity in a DU penetrator accounts for 0.8% of the radiation exposure, it is not clear what exposure scenario was used, i.e., exposure resulting from handling DU penetrators or long-term exposure as a result of DU penetrator degradation in the environment and subsequent transport and intake/uptake by a receptor.

To estimate the effects of this TRU activity level in a DU penetrator on long-term exposure, an evaluation was conducted using RESRAD Version 6.22 and the parameters previously used in the exposure assessment for a resident farmer (with irrigation) in the *Dose Assessment in Support of Decommissioning Plan for Jefferson Proving Ground*, dated May 2002, with one minor exception, i.e., the length of contaminated area parallel to the aquifer was set equal to the square root of the contaminated area.

In addition to these parameters, Pu-239 was added as a radionuclide with a concentration equivalent to the Pu-239: DU penetrator fraction multiplied by the DU soil concentration of 225 pCi/g and a contaminated area of 1.2E6 square meters. It is important to note that this analysis does not quantify an annual dose, but rather, the analysis evaluates the potential impact of TRU activity on the annual dose. The results of this analysis are presented in Table 1.

Table 1. Estimated Dose from Plutonium in a DU Penetrator Over Time

Dose	Elapsed Time (T) In Years							
	T=0	T=1	T=3	T=10	T=30	T=100	T=300	T=1000
Total dose (mrem/year)	24.8	23.6	21.2	14.9	5.3	0.12	23.0	25.7
Pu dose (mrem/year)	3.75E-5	3.72E-5	3.66E-5	3.46E-5	2.89E-5	1.1E-5	2.6E-12	1.8E-11

Pu dose fraction	1.51E-6	1.58E-6	1.72E-6	2.32E-6	5.43E-6	9.55E-5	1.13E-13	6.86E-13
Pu dose %	0.0002	0.0002	0.0002	0.0002	0.0005	0.0095	0.0000	0.0000

As noted above, this analysis focused on establishing the relationship between Pu-239/240 and the uranium isotopes present in DU penetrators. Note that analytical processes for isotopic analysis are not able to distinguish between Pu-239 and Pu-240; therefore, all activity was simply assigned to Pu-239.

Even though the final exposure scenario and applicable parameter values have not been assigned to model the contaminants present at JPG and provide final annual dose estimates, the relationship between TRU dose and dose due to all isotopes present at JPG should remain fairly consistent with that presented in the Table 1.

In Table 1, an apparent transition occurs between year 30 and year 300. From time T=0 to T=100, the "water independent" pathways predominate the annual dose. From time T=300 on, the "water dependent" pathways become the primary contributors to receptor annual dose.

CONCLUSION:

Based on the data and analysis provided herein, the stated plutonium activity present in a DU penetrator is estimated to have a negligible impact on annual exposures.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis k:

Decommissioning Plan for License SUB-1435, Jefferson Proving Ground, Madison, Indiana, Final, U.S. Department of the Army Soldier and Biological Chemical Command, June, 2002. (section 4.1.2)

A Preliminary Review of the Flow and Characteristics of Recycled Uranium Throughout the DOE Complex 1952-1999, DOE-F001-F001, U.S. Department of Energy, Washington, D.C., March, 2000.

Tank-Automotive and Armaments Command (TACOM) and Army Material Command (AMC) Review of Transuranics (TRU) in Depleted Uranium (DU) Armor, Bhat, R.K., Department of the Army, Fort Belvoir, Virginia, January 19, 2000.

Depleted Uranium in Kosovo, Post-Conflict Environmental Assessment, United Nations Environment Programme, Nairobi, Kenya, 2001. (section 2.2, page 14 & section 4(d), page 28)

Letter from Mr. David Michaels, U.S. Department of Energy, Environment, Safety, and

Health (ESH), to Ms. Tara Thornton, Military Toxics Project, Regarding "Concentrations of Plutonium in Depleted Uranium.", U.S. Department of Energy, January 20, 2000.

Examination and Analysis of Three Fired Depleted Uranium Penetrators, QINETIQ/FST/SMC/CR021209, QinetiQ Ltd., March, 2002. (item 4.5, 4,6, and appendix A)

Hazards from Depleted Uranium Produced from Reporcessed Uranium: WISE Uranium Project Fact Sheet,WISE Uranium Project, Diehl, Peter, Arnsdorf, Germany, September, 2001.

Contention B-1, Basis I. *[WITHDRAWN, BUT WITH WITHDRAWAL CLARIFIED AND SUPPLEMENTED]. In its January 3, 2006 Reply, STV accepted the Army's representation in its Response that background determinations will be made in areas (and, of course, from biota) "that have not been impacted by DU activities at JPG" and that background determinations will preferably include samples from off-site locations and time periods preceding DU use at JPG. Accordingly, the specific issues underlying this basis have been resolved by the additional information provided by the Army and it has been withdrawn.*

Nonetheless, since background determination affects so many other decisions to be made, and since the decisions have such long lasting implications (millions of years), STV's environmental risk modeling expert maintains that the selection of background data should be very conservative and the Army should not include any data that might have been affected by site DU activity. In particular, the evidence from J.J. Whicker, et al., From Dust to Dose: Effects of Forest Disturbance on Increased Inhalation Exposure, Science of the Total Environment (2006), indicates that because of the controlled burns at the JPG site, probably no area within the JPG boundaries would be unaffected and uncontaminated by the DU that oxidized off the projectiles, as the air contamination during the burns is likely to have spread the U to the edges of the base and beyond. Thus, STV interprets the Army's representation in its Response to replace the basic assumption in the FSP that areas within JPG site boundaries but away from the hot spots could be considered sufficiently uncontaminated to use in a composite "background" determination.

Army Witness: Harold W. Anagnostopoulos – Subject: Background

Analysis or Opinion of Army Witness: The FSP does not propose background levels. The FSP does identify the need and method for determining background concentrations for the radionuclides of concern at JPG in the media of interest, i.e., soil and water. The FSP requires background determination in areas that have not been impacted by DU activities at JPG – this may be on site or off site.

Activity ratios for natural and depleted uranium are widely published and routinely referenced. These values will be used to validate the presence of uranium isotopes and verify the origin as natural or depleted uranium. Background sample results that do not fall

within the range of expected values for activity ratio for natural uranium, if any, will not be included in the background data set.

Historical data will be used, if available, and of sufficient quality to support FSP objectives.

Note that the MARSSIM, endorsed by NRC, DOE, and EPA, is the appropriate guidance the Army will follow for this program, not RAGS. MARSSIM provides guidance on collection of background samples, if necessary. This contention is not relevant or germane to the Army's request for an alternate decommissioning schedule.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis I:

Environmental Radioactivity Form Natural, Industrial, and Military Sources, Fourth Edition, Esenbud and Gesell, Academic Press, 1997, ISBN 0-12-235154-1.

Multi-Agency Radiation Survey and Site Investigation Manual, NUREG-1575, Revision 1, August 2000.

Decommissioning Health Physics – A Handbook for MARSSIM Users, Abelquist, Institute of Physics Publishing, 2001, ISBN 0-7503-0761-7.

Manual for Conducting Radiological Surveys in Support of License Termination, NUREG/CR-5849, US NRC.

Review of the Environmental Quality Aspects of the TECOM DU Program at Jefferson Proving Ground, Indiana, Abbott, et. al., Monsanto Research Corp., 1984.

Decommissioning Plan for License SUB-1435, Jefferson Proving Ground, Madison, Indiana, Final, U.S. Department of the Army Soldier and Biological Chemical Command, June 2002. (section 4.4)

Contention B-1, Basis m. *[SUPPLEMENTED]. Air remains a potential exposure pathway as evidenced by the air sampling requirements to be implemented for the field workers (Health and Safety Plan, Section 4.2.2.1). If short-term air exposure is a concern for the workers, long-term air exposure is a concern for residents in surrounding communities, as well as for the animals living in the JPG ecosystem. Given the frequent burns that are used to clear brush at JPG, including in the DU Impact Area, conditions are prime for enhancing migration of soil-bound DU into the air. A recently published study provided solid evidence that fire does indeed increase the air migration pathway of soil uranium. Whicker et al studied air concentrations of uranium at the perimeter of the Los Alamos National Laboratory that were measured seasonally over a 10 year time period, including before and after fires, both wildfire and fires that were intentionally set (the equivalent of the JPG controlled burns). They found that the estimated dose due to U attached to particulate in the air at the perimeter of Los Alamos National Laboratory property increased by*

approximately 15% after even a "moderate" controlled burn, and this increase was greater (38%) after a more intensive wildfire. Further, the contaminated particulate matter increased seasonally, being highest during the spring months when the snow has melted, the ground is bare, winds tend to be gusty (as is true in southern Indiana), and there is little vegetation covering the ground. See JJ Whicker, et al., from Dust to Dose: Effects of Forest Disturbance on Increased Inhalation Exposure, Science of the Total Environment (2006).

Thus, the air pathway is a matter of "significant public interest" (making it an "important pathway" under NUREG-0475), and the human populations and wildlife in and around Jefferson Proving Ground are likely being exposed to and inhaling U-contaminated dust and to develop any truly "realistic [exposure] scenario" for JPG, air data needs to be collected to assess the air-borne dust-inhalation exposure pathway. As a result, the FSP is clearly deficient for purposes of adequate site characterization in providing for no air sampling whatsoever.

Army Witness: Harold W. Anagnostopoulos – Subject: Air Sampling

Analysis or Opinion of Army Witness: This correlation has no foundation. The HASP gives the Radiation Protection Manager (RPM) the discretion to require air sampling as conditions warrant. For the activities proposed in the FSP, air sampling for determining occupational exposure may be conducted for the sampling activity with the greatest potential for generating airborne radioactivity, i.e., preparation of penetrator samples for dissolution analysis and physical examination. In this instance, airborne radioactivity will be controlled through appropriate work practices. However, air sampling may be conducted to establish airborne concentrations the sampler may be exposed to, if any, for determination of "dose" or validating "no dose." This is a standard and accepted industry practice and has nothing to do with long-term exposures of receptors or potential receptors at or close to the site boundary from airborne radioactivity. This contention is not relevant or germane to the Army's request for an alternate decommissioning schedule.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis m:

Environmental Radioactivity Form Natural, Industrial, and Military Sources, Fourth Edition, Esenbud and Gesell, Academic Press, 1997, ISBN 0-12-235154-1.

Radiological Assessment, NUREG/CR-3332, Till & Meyer, U.S. NRC, 1983.

Long-Term Fate of Depleted Uranium at Aberdeen and Yuma Proving Grounds, Phase II: Human Health and Ecological Risk Assessments, LA-13156-MS, Los Alamos National Laboratory, 1996. (section 3.6.3, page 35)

Review of the Environmental Quality Aspects of the TECOM DU Program at Jefferson Proving Ground, Indiana, Abbott, et. al., Monsanto Research Corp., 1988. (section

2.1.4.2, page 2-25 & section 4.4.2.2, page 4-28)

A Review of the Radiological Environmental Monitoring Data at U.S. Army Jefferson Proving Ground, Madison, Indiana, Abbott, EG&G Mound Applied Technologies, Inc., 1988.

Decommissioning Plan for License SUB-1435, Jefferson Proving Ground, Madison, Indiana, Final, U.S. Department of the Army Soldier and Biological Chemical Command, June 2002. (section 4.3.7.1)

Environmental Report, Jefferson Proving Ground, Madison, Indiana, Final, U.S. Department of the Army Soldier and Biological Chemical Command, June, 2002. (section 3.1.4)

Potential Health Impacts from Range Fires at Aberdeen Proving Ground, Maryland, ANL/EAD/TM-79, Prepared for the U.S. Army, Directorate of Safety, Health, and Environment, for APG by Argonne National Laboratory, Williams et al., March, 1998.

Environmental Assessment for Testing Uranium Penetrator Munitions at U.S. Army Combat Systems Test Activity, Aberdeen Proving Ground, Maryland. Davis, 2000.

Environmental Radiation Monitoring Program Plan for License SUB-1435, Jefferson Proving Ground, Final, U.S. Army Soldier and Biological Chemical Command, September, 2003. (section 3.3.5)

Health and Environmental Consequences of Depleted Uranium Use in the U.S. Army: Technical Report, U.S. Army Environmental Policy Institute, June, 1995. (section 7.1.1)

Updated Calculation of the Inhalation Dose from the Cerro Grande Fire Based on Final Air Data, LA-UR-01-1132, Kraig, et al., Los Alamos National Laboratory, February, 2001.

Health Risk Assessment Consultation No. 26-MF-7555-00D, Depleted Uranium - Human Exposure Assessment and Health Risk Characterization in Support of the Environmental Exposure Report "Depleted Uranium in the Gulf" of the Office of the Special Assistant to the Secretary of Defense for Gulf War Illnesses, Medical Readiness and Military Deployments (OSWAGI), U.S. Army Center for Health Promotion and Preventative Medicine, September 15, 2000. (section 5.2, Camp Doha)

Depleted Uranium in Kosovo, Post-Conflict Environmental Assessment, United Nations Environment Programme, Nairobi, Kenya, 2001. (section 2.2, page 15)

Contention B-1, Basis n [CLARIFIED]. *In order to really do a site-specific environmental and human health risk assessment, understanding the fate and transport (F&T) of DU within the JPG ecosystem is critical. In order to develop such a model, standard eco-risk-*

associated field sampling practices specify samples from different parts of the ecosystem within the same approximate period of time and definitely within the same field season in order to identify the distribution of the contaminant (DU) at that time. Further it is best to take multiple samples from these different locations over time. Thus, to truly model F&T within the JPG ecosystem (which is NOT the Yuma or Aberdeen Proving Ground ecosystem), a particular sample taken at a particular time should include all media and relevant biota and each of these media and biota should be sampled on multiple occasions. Ideally, samples should also be taken under different types of field conditions, as appropriate for the changes that occur at the site of concern. For example, at a site that floods, as JPG does, samples should be taken from all media and biota at high flow (flood season) and low flow. Similarly, in a seasonal environment like JPG, samples should be taken from all media and biota in different seasons. When reproduction is seasonal for the biota of potential concern, seasonal sampling is of special concern. See, e.g., , G.W. Suter II, et al., Ecological Risk Assessment for Contaminated Sites, CRC Press [Lewis Publishers], Boca Raton, FL (2000), esp. at 77. Thus, the much more limited sampling described in section 6.3 of the FSP is deficient for purposes of adequate site characterization.

Army Witness: Michael L. Barta – Subject: Environmental and Ecological Risk

Analysis or Opinion of Army Witness: This site characterization program is in support of the NRC's D&D process. The RI/FS paradigm implemented under CERCLA does not apply. Furthermore, an ecological risk assessment is neither planned for nor required. The Environmental Report prepared by NRC will address ecological and human health risks from the perspective of National Environmental Policy Act (NEPA). This contention is not relevant or germane to the Army's request for an alternate decommissioning schedule.

The proposed biota sampling program was designed to respond to requests from the NRC as well as align with the Army's programmatic constraints. As a result, deer were proposed for sampling first (see also the response to FSP Comment "o" below). Based on the deer sampling results, which indicated that DU was not present in the deer tissues, no additional deer sampling is warranted. Other biota were proposed for collection only if DU was detected in the deer tissues. The Army believes that the most recently collected deer data, in conjunction with various abiotic data (e.g., surface soil and surface water), are sufficient to determine if DU is migrating at JPG.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis n:

Ebinger, M. and W. Hansen. 1996. JPG Data Summary and Risk Assessment. Submitted to the U.S. Army Test and Evaluation Command by Los Alamos National Laboratory, New Mexico.

SAIC. 2005. Field Sampling Plan, Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana. Final. May.

SAIC. 2006. Deer Tissue Sampling Results, Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana. Final. August.

SEG (Scientific Ecology Group). 1996. Jefferson Proving Ground Depleted Uranium Impact Area Characterization Survey Report. Volume I. Oak Ridge, Tennessee. February.

U.S. Army. 2002. Decommissioning Plan for License SUB-1435. Jefferson Proving Ground, Madison, Indiana. Prepared for the U.S. Army SBCCOM by SAIC. June.

Contention B-1, Basis o. [CLARIFIED]. *Although deer are not the most representative biota to sample, they are the only biota proposed for sampling by section 6.3 of the FSP. Nonetheless, when data from samples early and late in DU testing are not combined, it is evident that DU levels in even the deer are increasing. This result in deer clearly mandates sampling other, more representative biota as well. Based on what little data is available, the bioaccumulation factors (BAFs) for vegetation and the aquatic filter feeders such as crayfish (both of which are eaten by higher animals and humans) are relatively high, on the order of 102 to 103 times as high as the BAFs for persistent, bioaccumulative, and toxic chemicals (PBTs) listed as being of concern by the U.S. EPA and the Persistent Organic Pollutants (POPs) Treaty. Clearly, vegetation and aquatic filter feeders are better indicators of DU migration into the eco-food chain than are deer and they should be sampled. For example, the mean of the two clam data points, when compared to the mean of the surface water data provided in Table 2-1 indicate that the clams bioaccumulation factor (BAF) is approximately 900. This is the highest bioaccumulation rate determinable among the biota listed in Tables 2-1 and 2-2 on page 2-9 of the FSP. Since clams are also eaten by both wildlife (raccoons and wading birds, for example) and humans, clams are thus an important second species to include in the biotic sampling throughout the monitoring period. Additionally, the FSP proposes (and the Staff accepts on page 6 of the April 2006 SER) to sample other biota ONLY IF there is detectable levels of DU in the deer tissue, and will only do this in another sampling year. This proposal is directly contrary to what is considered to be "Best Practices" for sampling biota as part of an ecological assessment. See, e.g.,* , G.W. Suter *II, et al., Ecological Risk Assessment for Contaminated Sites, CRC Press [Lewis Publishers], Boca Raton, FL (2000), esp. at 77.*

Army Witness: Michael L. Barta – Subject: Ecological Sampling

Analysis or Opinion of Army Witness: The FSP does not state that deer are the most representative biota to sample. Rather, deer are being collected in direct response to the NRC's request. The Army does not agree that the historical data support the contention that DU levels in deer are increasing. Indeed, the data presented in the recent deer tissue report do not indicate the presence of DU in the tissues. The collection of deer was proposed to occur before any other biota were considered for sampling because of the

hunting that occurs in and near JPG. In addition, STV has raised concerns about deer ingestion in the past.

The Army agrees that other biota might be beneficial indicators of DU uptake and proposed collection of other biota (plants, earthworms, fish, small birds, and small mammals) if the deer data, in conjunction with the abiotic data (e.g., surface soil, surface water), suggested that migration and subsequent uptake could be occurring. However, as the deer data did not indicate the presence of DU in the tissues, there is no need to collect additional biota samples.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis o:

Ebinger, M. and W. Hansen. 1996. JPG Data Summary and Risk Assessment. Submitted to the U.S. Army Test and Evaluation Command by Los Alamos National Laboratory, New Mexico.

SAIC. 2005. Field Sampling Plan, Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana. Final. May.

SAIC. 2006. Deer Tissue Sampling Results, Depleted Uranium Impact Area Site Characterization, Jefferson Proving Ground, Madison, Indiana. Final. August.

SEG (Scientific Ecology Group). 1996. Jefferson Proving Ground Depleted Uranium Impact Area Characterization Survey Report. Volume I. Oak Ridge, Tennessee. February.

U.S. Army. 2002. Decommissioning Plan for License SUB-1435. Jefferson Proving Ground, Madison, Indiana. Prepared for the U.S. Army SBCCOM by SAIC. June.

Contention B-1, Basis p [WITHDRAWN].

Contention B-1, Basis q. [PARTIALLY WITHDRAWN, WITH REMAINING BASIS SUPPLEMENTED]. In its January 3, 2006 Reply, STV accepted the representation in the Army's Response that DU dissolution rates would be calculated in multiple soil types, so this part of this Basis is withdrawn. However, DU dissolution rates should also be calculated under different site specific wetness and temperature regimes in order to measure accurately DU dissolution at JPG. Thus, Table 4-1 and related text of the FSP are inadequate because they do not specify such multiple measurements. A recently published study of DU samples taken at Aberdeen Proving Ground demonstrates that some oxides of U are indeed relatively insoluble, and that U(VI) sorbs efficiently to soil. However, other U oxides are water soluble, and will wash out and through the soil. And, as clearly pointed out in this paper, U is not static in the environment, it changes valence state and interacts with other elements variably over time and space, given other changing

parameters like moisture, soil content, and pH. See W. Dong, et al., Sorption and Bioreduction of Hexavalent Uranium at a Military Facility by the Chesapeake Bay, Environmental Pollution (2006), 132-142, esp. at 142.

Army Witness: Joseph N. Skibinski – Subject: Uranium Environmental Chemistry

Analysis or Opinion of Army Witness: The FSP addresses evaluation of DU corrosion for the two soil types present at JPG. The leachability test, using the testing regime in ANS/ANSI-16.1, will provide an estimate of the "theoretical" corrosion/dissolution rate. Further testing of DU penetrators in a controlled environmental chamber will provide data to evaluate and validate the "theoretical" corrosion/dissolution rate.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis q:

Trzaskoma, P. 1982. "Corrosion Rates and Electrochemical Studies of a DU Alloy Tungsten Fiber Metal Matrix Composite," J. Electrochem. Soc.: 13981401. July.

AEPI (Army Environmental Policy Institute). 1995. Health and Environmental Consequences of Depleted Uranium in the U.S.: Technical Report. June.

Weirick, L., and Douglas, H. 1976. "Effect of Thin Electrodeposited Nickel Coatings on Corrosion Behavior of U-.75Ti," Corrosion 32:6, p. 209.

ENREZA. 1995. UO_2 Leaching and Radionuclide Release Modeling Under High and Low Ionic Strength Solution and Oxidation Conditions.

Contention B-1, Basis r. *The Independent Technical Review Team Leader for the HSP and FSP is the same person as the Project Manager (Corinne Shia, SAIC). See FSP, Certification 4- Contractor Certification of Independent Technical Review, and HSP, Certification 4 - Contractor Certification of Independent Technical Review. To assure "independent" technical review, these roles should be performed by different individuals.*

Army Witness: Corrine M. Shia – Subject: Independent Technical Review
(Formerly with SAIC, Ms. Shia has become a Senior Program Manager at Alion Science and Technology, Corp. She continues to provide independent technical reviews on key SAIC documentation.)

Analysis or Opinion of Army Witness: Independent reviews are completed by individual(s) who are not the primary authors on the document and who have educational and/or work experience in the area being reviewed. It is appropriate, and at times preferred, to have the same independent reviewer complete reviews of documents that are interdependent, such as multiple volumes or a series of separate documents related to a

program purpose (e.g., site characterization plans). This review permits identification of consistencies in technical and programmatic aspects of the documents.

This reviewer was not the primary author on these documents and has the requisite education, experience, and skills to complete independent reviews of both documents. At the time the review was completed, Ms. Shia was a senior program manager and mechanical engineer at SAIC with over 30 years of experience on environmental programs similar to the one proposed. This contention is not relevant or germane to the Army's request for an alternate decommissioning schedule.

Authorities Identified As Supporting the Analysis/Opinion of Army's Witness As To Basis r.
SAIC. Quality Control Plan, DU Impact Area, JPG, Madison, Indiana. Final. May 2005.

Copies Of Documents And Things

(a) (2) (i) Copies of all documents and data compilations in the possession, custody, or control of the Army that are relevant to STV's Contention B1and its supporting bases are contained in the CD-Rom, entitled "Army Disclosures Pursuant to §2.336, 01/23/2007, NRC Docket No. 40-8838-MLA" and containing 126.0 MB of information which accompanies the hard copy of this document.

Except insofar as the same may be identified as analysis or authority upon which a person bases his or her opinion, documents prepared for internal use only by Science Applications International Corporation (SAIC) and which SAIC is not required to provide to the Army under terms of its contract and scope of work have not been provided to the parties. The Army is informed these internal documents consist of internal clarification of the responsibilities of SAIC's various departments and employees for prosecution of its JPG contract with the Army and of internal directions for completion of contract services and preparation of the various documents and submittals due the Army under that contract. It is the Army's position both that such documents are not in the possession, custody or control of the Army and that such documents are not relevant per se to STV's contention or supporting bases.

(A) (2) (ii) Copies of all tangible things (e.g., books, publications and treatises) in the possession, custody, or control of the Army that are relevant to STV's Contention B1 and its supporting bases are contained in the CD-Rom, entitled "Army Disclosures Pursuant to §2.336, 01/23/2007, NRC Docket No. 40-8838-MLA" and containing 126.0 MB of information which accompanies the hard copy of this document. Documents identified above as third party authorities supporting the analysis/opinion of Army's witnesses have not been produced on the assumption that the same are standard text otherwise available to the parties.

Except insofar as the same may be identified as analysis or authority upon which a person bases his or her opinion, documents prepared for internal use only by Science

Applications International Corporation (SAIC) and which SAIC is not required to provide to the Army under terms of its contract and scope of work have not been provided to the parties. The Army is informed these internal documents consist of internal clarification of the responsibilities of SAIC's various departments and employees for prosecution of its JPG contract with the Army and of internal directions for completion of contract services and preparation of the various documents and submittals due the Army under that contract. It is the Army's position both that such documents are not in the possession, custody or control of the Army and that such documents are not relevant per se to STV's contention or supporting bases.

Identification of Privileged Documents

(A) (2) (iii) Pursuant to the Order modifying 10 CFR § 2.336, entered herein on January 16, 2007, the Army has not identified or produced: (a) documents on ADAMS which have been served in the current proceedings or the prior Jefferson Proving Grounds (JPG) decommissioning proceedings initiated on petition by STV; (b) media clippings, recordings or videos; and (c) duplicate copies of documents which are identical in content and annotation but are in the hands of multiple recipients.

(A) (3) Pursuant to the Order modifying 10 CFR § 2.336, entered herein on January 16, 2007, the Army submits the following list of documents, otherwise required to be disclosed, for which a claim of privilege or protected status is being made:

a. Stream Cave Gauging Precipitation Data Tasks_ Assump Pricing_31 Oct.xls (Discussion of pricing of tasks);

b. DU Impact Area Site Characterization Strategy In Support of NRC License SUB-1435 Jefferson Proving Ground (JPG), Indiana: Candidate Activities for Funding Augmentation – February 2006;

c. Comments to the Field Sampling Plan for the JPG DU Area (Discussion of draft)

d. Responses To Action Items Identified At The 8 September 2005 Meeting Between The U.S. Nuclear Regulatory Commission (Nrc) And U.S. Army Regarding Nrc License Sub-1435, Jefferson Proving Ground (Discussion of draft)

e. Draft Quality Control Plan Depleted Uranium Impact Area Site Characterization Jefferson Proving Ground, Madison, Indiana May 2005;

f. Comments On Draft Field Sampling Plan Addendum Soil Verification;

g. Cover Letter from SAIC to Andrew B. Evens, U S Army Corps of engineers, dated November 8, 2005, with Draft Field Sampling Plan Addendum, Site

Character- ization, Deer Sampling Event and Draft HASP (Discussion of draft);

h. Draft Responses To Action Items Identified At The 8 September 2005 Meeting between the NRC And the U.S. Army Regarding NRC License Sub-1435, Jefferson Proving Ground (Discussion of draft)

i. More Comments on the Field Sampling Plan Addendum for Soil Verification;

j. E-mail comments between SAIC and Army on STV Paper #10, 10/19/2006;

k. E-mail comments between SAIC and Army on STV Paper #15, 10/19/2006;

l. E-mail comments between SAIC and Army on STV Paper #20, 10/19/2006, with DU paper #20 Graphs.xls;

m. E-mail Comments to Draft Powerpoint Presentation to NRC on Proposed Monitoring Well Locations for the Characterization of the JPG DU Area, 10/05/2006;

n. E-mail with Army Comments/Questions on Draft Deer Tissue Sampling Results, Jefferson Proving Ground, Comments: July 6th, 2006, Responses: July 13th, 2006;

o. E-mail dated 06/29/2006 relating to Draft Deer Tissue Sampling Results;

p. E-mail dated 04/10/2006 with Draft FSP;

q. E-mail dated 01/31/2006 with Draft Responses to NRC's January 2006 RIA;

r. E-mail dated 06/12/2006 with Draft Responses to STV's May 2006 Contentions;

s. E-mail comments between Army and SAIC dated 01/10/2007 with attached comments on FSP Addendum #4 and the Well Location Selection Report;

t. E-mail comments between Army and SAIC dated 11/09/2005 with attached comments on Draft FSP;

u. E-mail comments on using the HELP model to estimate recharge at JPG dated 02/01/2006;

v. E-mail comments between the Army and SAIC dated 02/02/2006 concerning the possible use of the stream flow hydrograph separation and recession curve displacement methods at JPG;

w. E-mail comments between the Army and SAIC dated 01/19/2006 concerning the Fall 2005 Deer Tissue Sampling;

x. E-mail discussion between Army and SAIC dated 08/23/2006 concerning reducing TPU in iso U samples for JPG;

y. E-mail discussion between Army and SAIC dated 07/06/2006 concerning deer sampling;

z. E-mail discussion between Army and SAIC dated 02/01/2006 concerning draft responses to NRC's RIA;

aa. E-mail discussion between Army and SAIC dated 09/19/2006 concerning the upcoming well selection meeting with NRC;

bb. E-mail discussion between Army and SAIC dated 07/11/2006 concerning well location selections;

cc. E-mail discussion between Army and SAIC dated 05/03/2006 with attachment commenting on FSP Addendum #3;

dd. E-mail discussion between Army and SAIC dated 01/14/2005 concerning then current activities on site;

ee. E-mail discussion between Army and SAIC dated 04/11/2006 with attachment commenting on FSP Addendum #2

ff. E-mail discussion between Army and SAIC dated 11/23/2004 with attachment comments on dose assessment;

gg. E-mail discussion between Army and SAIC dated 08/01/2006 concerning the NRC's request for information on the field sampling procedures and associated health and safety plans, RWPs, and the required training for the workers;

hh. E-mail discussion between Army and SAIC dated 08/24/2006 concerning Coordination with NRC Oversight of Stream/Cave Spring Installation;

ii. E-mail discussion between Army and SAIC dated November, 2006 concerning disposal of deer tissue sampling (privilege is claimed only as to e-mails subsequent to the 11/06/2006 e-mail copied to NRC;

jj. E-mail discussion between Army and SAIC dated 07/06/2006 concerning draft deer sampling analysis;

kk. E-mail discussion between Army and SAIC dated 11/17/2006 concerning questions and comments on well installation decisions;

ll. E-mail discussion intra-Army dated 06/16/2005 concerning potential characterization activities;

mm. E-mail discussion between Army and SAIC dated 06/07/2006 concerning Comments and responses to Draft FSP Addendum #2;

nn. E-mail discussion between Army and SAIC dated 09/13/2006 concerning draft drawing of U transport model for JPG.

The Army claims a "deliberative process" privilege in each of the above listed materials in that such documents may reveal the mental processes of governmental officials generated prior to reaching a decision pertaining to submittals and proposals to the NRC in the decommissioning proceedings. No claim of privilege is made as to materials containing post-decisional analyses or that do not reveal the "give and take" of decision-making herein.

Conclusion

The Army's initial disclosures made herein are based on the information and documentation reasonably available to it. The Army has not fully completed its investigation of the matters raised by STV in this case and reserves the right to amend and/or supplement the responses and disclosures made herein as further information becomes available. All relevant materials required by 10 CFR § 2.336, as modified, have been disclosed, and the disclosures are accurate and complete as of the date of this document.

Dated this 24th day of January, 2007.

Respectfully submitted,

John J. Welling
Chief Counsel

Frederick P. Kopp
Counsel

U.S. Army Garrison - Rock Island Arsenal
Office of Counsel (AMSTA-RI-GC)

One Rock Island Arsenal Place
Rock Island, IL 61299-5000

Attorneys for the Army

Certification of Compliance with 10 CFR §2.336

County of Rock Island)
) ss
State of Illinois)

The undersigned certifies that to the best of the signer's knowledge, information, and belief, formed after a reasonable inquiry, all relevant materials required by 10 CFR § 2.336, as modified by the Order pertaining thereto entered herein on January 16, 2007, have been disclosed, and that the disclosures are accurate and complete as of the date of this certification.

Signed this 24th day of January, 2007.

Frederick P. Kopp

Subscribed and sworn to before me this 24th day of January, 2007.

Notary Public.

OFFICIAL SEAL
JOHN J. WELLING
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES 1-10-09

The documents provided with this disclosure
are too large to transmit electronically
and are therefore contained in a compact disc
accompanying the hard copy of army's disclosure.

A list of those documents is attached hereto for electronic
transmission.

Amendment #13 and SER.pdf
doccontent2.pdf
doccontent.pdf
Document2.pdf
Document (3).pdf
Document.pdf
DU Airborne Transport.pdf
Evens JPG DU Range SOW 8-10-05.pdf
Final FSP.pdf
FRN - 7 Mar 2006.pdf
From Dust to Dose.pdf
Jefferson_Letter to NRC from Army_May 25_2005.pdf
JPG_-_Mc.pdf
Monitoring Well Placement Meeting 101206.pdf
NRC EA For JPG.pdf
NRC Inspection.pdf
NRC Meeting d.pdf
NRC Meeting.pdf
NRC Memo - Off site Transport Model Info.pdf
NRC RAI.pdf
NRC Response.pdf
OB Unit Inspection 2006.pdf
Pages 1 - 5 from Monitoring Well Presentation.pdf
Pages 6 - 10 from Monitoring Well Presentation-2.pdf
Pages 11 - 15 from Monitoring Well Presentation-3.pdf
Pages 16 - 20 from Monitoring Well Presentation.pdf
Pages 21 - 25 from Monitoring Well Presentation-5.pdf
Pages 26 - 30 from Monitoring Well Presentation-6.pdf
Pages from EIS For Disposal page 84.pdf
Pages from EIS For Disposal page 86.pdf
Pages from EIS For Disposal page 87.pdf
Richard Hill NUREG 1757 Comments.pdf
RSO.pdf
TECHNICAL MEMORANDUM - Dose Assessment Procedure for JPG.pdf
Well Location Selection_10_12_06-ftp.pdf
WISE Fact Sheet_Haz in DU from reprocessed U.pdf
JPG 2006 Proposed Burn Areas.JPG
APGRMLRDGFAXSVR_050708114105175 7.TIF
Fax-Aug-04-2006-12-53-43-0736.tif
3211 PROGRESS REPORT July and August 2006.doc
3211 PROGRESS REPORT June 2006.doc
3211 PROGRESS REPORT November 2006.doc
3211 PROGRESS REPORT October 2006.doc
3211 PROGRESS REPORT September 2006.doc
3211 PROGRESS REPORT_March 1-31 2006.doc
4770 PROGRESS REPORT April 2006.doc
4770 PROGRESS REPORT August 2006.doc
4770 PROGRESS REPORT July 2006.doc
4770 PROGRESS REPORT June 2006.doc
4770 PROGRESS REPORT May 2006.doc
4770 PROGRESS REPORT November 2006.doc
4770 PROGRESS REPORT October 2006.doc
4770 PROGRESS REPORT September 2006.doc
4770 PROGRESS REPORT_February 1-March 31 2006.doc
8527 PROGRESS REPORT August 2006.doc
8527 PROGRESS REPORT July 2006.doc
8527 PROGRESS REPORT June 2006.doc
8527 PROGRESS REPORT November 2006.doc
8527 PROGRESS REPORT October 2006.doc
8527 PROGRESS REPORT September 2006.doc
8527 PROGRESS REPORT_April and May 2006.doc
8527 PROGRESS REPORT_February 1-March 31 2006.doc
Action Item Response Due 011907.doc
Army Letter to NRC_May 2005.doc
Copy of JPG - Statement of Intent 12 26 06.doc
Copy of Letter to Tom McL deer samples.doc
Copy of MAP2.doc
Copy of Map.doc

Copy of May 24 .doc
Copy of McLaughlin12May06.doc
Copy of McLaughlin25May06.doc
Copy of McLaughlin 06 July 06.doc
Copy of McLaughlin Letter 7-25-05.doc
Copy of NRC Public Parcitipation 0605.doc
Copy of October 12 2006 Meeting Action Items (2).doc
Copy of October 12 2006 Meeting Action Items.doc
Copy of PROGRESS REPORT April 2006.doc
Copy of PROGRESS REPORT August 2006.doc
Copy of PROGRESS REPORT July 2006.doc
Copy of PROGRESS REPORT June 2006.doc
Copy of PROGRESS REPORT May 2006.doc
Copy of PROGRESS REPORT October 2006.doc
Copy of PROGRESS REPORT September 2006.doc
Copy of PROGRESS REPORT_April2001.doc
Copy of PROGRESS REPORT_April2002.doc
Copy of PROGRESS REPORT_April 2004.doc
Copy of PROGRESS REPORT_April 2005.doc
Copy of PROGRESS REPORT_Aug 2005.doc
Copy of PROGRESS REPORT_Aug - Nov I2003.doc
Copy of PROGRESS REPORT_August2001.doc
Copy of PROGRESS REPORT_August2002.doc
Copy of PROGRESS REPORT_August 2004.doc
Cover Letter NRC FSP Addedums 23.doc
Cover Letter NRC RAI - 18 Jan 06.doc
DASA Questions and Responses Concerning 110705.doc
DASA Questions and Responses Concerning.doc
Deer Collection Order (2).doc
ERM Spring 2006 Sample Results Cover Letter 100306.doc
Fracture Trace analysis Report 606.doc
FWS Contaminant Study Reply 2.doc
FWS Contaminant Study Reply.doc
Jefferson Proving Ground Facility.doc
JPG - Statement of Intent 12 26 06.doc
Letter to Tom McL deer samples.doc
MAP2.doc
Map.doc
May 24 .doc
McLaughlin12May06.doc
McLaughlin25May06.doc
McLaughlin 06 July 06.doc
McLaughlin Letter 7-25-05.doc
NRC Public Parcitipation 0605.doc
October 12 2006 Meeting Action Items (2).doc
October 12 2006 Meeting Action Items.doc
PROGRESS REPORT April 2006.doc
PROGRESS REPORT August 2006.doc
PROGRESS REPORT July 2006.doc
PROGRESS REPORT June 2006.doc
PROGRESS REPORT May 2006.doc
PROGRESS REPORT October 2006.doc
PROGRESS REPORT September 2006.doc
PROGRESS REPORT_April2001.doc
PROGRESS REPORT_April2002.doc
PROGRESS REPORT_April 2004.doc
PROGRESS REPORT_April 2005.doc
PROGRESS REPORT_Aug 2005.doc
PROGRESS REPORT_Aug - Nov I2003.doc
PROGRESS REPORT_August2001.doc
PROGRESS REPORT_August2002.doc
PROGRESS REPORT_August 2004.doc
PROGRESS REPORT_Dec2002.doc
PROGRESS REPORT_Dec 1 - 31 2005.doc
PROGRESS REPORT_Dec I2003.doc
PROGRESS REPORT_December2001.doc
PROGRESS REPORT_December 2004.doc
PROGRESS REPORT_December 2005.doc

PROGRESS REPORT_Febl2004.doc
PROGRESS REPORT_Febl2004_Corrected.doc
PROGRESS REPORT_February2002.doc
PROGRESS REPORT_February 1-28 2006.doc
PROGRESS REPORT_February 2005.doc
PROGRESS REPORT_February 2006.doc
PROGRESS REPORT_Jan-April2003.doc
PROGRESS REPORT_Janl2004.doc
PROGRESS REPORT_January2002.doc
PROGRESS REPORT_January 1-31 2006.doc
PROGRESS REPORT_January 2005.doc
PROGRESS REPORT_January 2006.doc
PROGRESS REPORT_July2001.doc
PROGRESS REPORT_July2004.doc
PROGRESS REPORT_July 2005.doc
PROGRESS REPORT_Julyl2002.doc
PROGRESS REPORT_June2001.doc
PROGRESS REPORT_June 2004.doc
PROGRESS REPORT_June 2005.doc
PROGRESS REPORT_Junel2002.doc
PROGRESS REPORT_March2002.doc
PROGRESS REPORT_March 2004.doc
PROGRESS REPORT_March 2005.doc
PROGRESS REPORT_March 2006.doc
PROGRESS REPORT_May2001.doc
PROGRESS REPORT_May 2004.doc
PROGRESS REPORT_May 2005.doc
PROGRESS REPORT_May-Julyl2003.doc
PROGRESS REPORT_Mayl2002.doc
PROGRESS REPORT_Nov2002.doc
PROGRESS REPORT_November2001.doc
PROGRESS REPORT_November 2004.doc
PROGRESS REPORT_November 2005.doc
PROGRESS REPORT_OCT2002.doc
PROGRESS REPORT_October2001.doc
PROGRESS REPORT_October 2004.doc
PROGRESS REPORT_October 2005.doc
PROGRESS REPORT_Sept2002.doc
PROGRESS REPORT_Sept2005.doc
PROGRESS REPORT_Sept 1 - Nov 30 2005.doc
PROGRESS REPORT_September2001.doc
PROGRESS REPORT_September 2004.doc
Responses to NRCs Jan 2006 RAI_Final.doc
RSO 2-16-06.doc
RSO 5-31-06.doc
TECHNICAL MEMORANDUM - Dose Assessment Procedure for JPG.doc
Army Meeting Attendees.msg
biannual sampling results.msg
Coordination with NRC Oversight of Stream Cave Spring Installatio n.msg
Current Status of JPG Field Activities.msg
Deer Sampling.msg
DU Burn on 04 05 2006.msg
DU WELL SAMPLING AT JPG.msg
FedEx Address.msg
FEDEX.msg
Follow-Up Supersting Earth Resistivity System Inquiry.msg
FSP & HASP Addendums # 2 & #.msg
FW addenda to the field sampling plan and the health and safety plan.msg
FW Current Status of JPG Field Activities.msg
FW Deer Sampling in February (19).msg
Fw DU Sampling - Oct 17 2005 (8).msg
FW Follow-Up Supersting Earth Resistivity System Inquiry.msg
FW FW Call.msg
FW FW JPG DU Field Sampling Plan.msg
Fw JPG - Schedule Conflicts with Air National Guard activities .msg
FW JPG DU Field Sampling Plan (10).msg
FW JPG license amendment request acceptance letter.msg
FW Need complete copy of one of your reference documents (1).msg

- FW NRC License SUB-1435 Army Submission to NRC on JPG DU Impact Ar ea (11).msg
- Fw References for USGS borehole flowmeter experience.msg
- FW Supersting Information.msg
- Hear is a clean SAIC Final response to the NRC RAI'sl.msg
- JPG Disposal of Deer Samples.msg
- JPG (12).msg
- JPG Deer Samples.msg
- JPG.msg
- Meeting Memo.msg
- Meeting with NRC Oct 12.msg
- Meeting.msg
- missing errata sheets.msg
- Need complete copy of one of your reference documents.msg
- Next Field Work schedule for JPG.msg
- NRC Action Items.msg
- NRC Annual Inspection.msg
- NRC EA for JPG.msg
- NRC License SUB-1435 Army Submission to NRC on JPG DU Impact Area.msg
- NUREG Comments.msg
- Periodic meeting with JPG.msg
- Presentation for NRC Meeting on Thursday Oct 12 2006.msg
- Public Meeting Notice.msg
- Radiological Responsibility.msg
- RE NRC License SUB-1435 - Reschedule of Proposed Conduit Monitoring Wells.msg
- RE .msg
- Re ADAMS document discussing lab QAPP.msg
- RE ASR.msg
- RE biannual sampling results.msg
- RE Coordination with NRC Oversight of Stream Cave Spring Installatio n (8).msg
- RE Current Status of JPG Field Activities (8).msg
- RE Current Status of JPG Field Activities (9).msg
- RE Current Status of JPG Field Activities.msg
- RE Deer Sampling in February (10).msg
- RE Deer Sampling.msg
- Re Deer tissue sampling results.msg
- RE Fed Ex.msg
- RE Follow-Up Supersting Earth Resistivity System Inquiry.msg
- RE FSP & HASP Addendums # 2 & # (18).msg
- RE FSP Addendum # 2 (3).msg
- RE FSP Addendum # 2.msg
- Re FW Call 2.msg
- RE FW Call.msg
- Re FW FW Call (1).msg
- RE FW JPG DU Field Sampling Plan.msg
- Re FW USFWS Deer Sampling Equipment.msg
- Re JPG (2).msg
- RE JPG and contact info Is Thursday soon enough or do you need it sooner .msg
- RE JPG.msg
- RE Meeting.msg
- RE Need complete copy of one of your reference documents (5).msg
- RE Next Field Work schedule for JPG.msg
- RE Paragon Analysis Status (8).msg
- RE Radiological Responsibility.msg
- Re Reorganization (15).msg
- RE Revised JPG Schedule.msg
- RE SAIC NRC license use at JPG - NOT Terminated (14).msg
- RE SAIC NRC license use at JPG - NOT Terminated.msg
- RE SAIC Teleconference with Peckinpaugh.msg
- RE Stream Gauge Monitoring on (60).msg
- RE Supersting Information.msg
- Replacement of Radiation Safety Officer.msg
- Response to slides.msg
- SAIC NRC license use at JPG - NOT Terminated.msg
- Schedule for January 2007 GW Monitoring at JPG.msg
- Stream Gauge Monitoring on .msg
- Acceptance Review.txt
- Address.txt
- August 2 agenda.txt

Burn documents.txt
Deer Sampling at JPG.txt
Deer Sampling Equipment.txt
Deer Sampling Items.txt
Deer Sampling Schedule3.txt
Discussion Topics with USFWS.txt
DU Air Transport Paper.txt
DU Sampling (Dec).txt
DU Sampling.txt
Dust to Dose2.txt
EI Survey.txt
Field Supplies Being Sent to JPG.txt
Figure 4-13.txt
Fish and Wildlife Service contaminant Study.txt
FW Burn documents.txt
FW Deer Sampling Schedule.txt
FW Discussion Topics with USFWS 2.txt
FW Discussion Topics with USFWS.txt
FW DU Sampling (Dec)c.txt
FW Gun- Big Oaks Deer Collection.txt
FW JPG DU Field Sampling Plan.txt
FW JPG license amendment request acceptance letter.txt
FW memorandum re air transport.txt
FW Need info about air samples and referenced documents from SAI C.txt
FW NRC License SUB-1435 Army Submission to NRC on JPG DU Impact Ar ea.txt
FW NUREGCR-6705.txt
FW Public Meeting Notice for JPG.txt
FW Radiological monitoring a.txt
FW StreamCave GaugingMonitoring Precipitation Data.txt
FW teleconference to discuss FSP.txt
FW USFWS Deer Sampling Equipment.txt
FW USFWS Deer Sampling Equipmenta.txt
Gun- Big Oaks Deer Collection.txt
JPG Task Update.txt
More Shipments In.txt
NRC License SUB-1435 Army Submission to NRC on JPG DU Impact Ar ea.txt
NRC Meeting Attendees from SAIC.txt
Public Meeting Notice.txt
Re DU Air Transport Paper.txt
RE FSP Addendum # 2.txt
RE FW JPG DU Field Sampling Plan.txt
RE JPG Deer Sampling Update.txt
RE JPG DU Field Sampling Plan.txt
RE Need info about air samples.txt
RE Proposed JPG Field Schedule.txt
RE Reference1.txt
RE Reference.txt
Re SamplingAnalysis at JPG.txt
RE teleconference to discuss FSP.txt
Re USFWS Deer Sampling Equipment.txt
SamplingAnalysis at JPG.txt
StreamCave GaugingMonitoring Precipitation Data.txt
teleconference to discuss FSP.txt
Teleconference with Save the Valley.txt
THREE COOLERS ARRIVED.txt
USFWS Deer Sampling Equipment.txt

RESUMES

Shia Resume January 2007.pdf
Anagnostopoulos Resume 200...
Barta Resume 2007.doc
Eaby Resume January 2007.doc
Skib Resume January 2007.doc
Snyder Resume 2007.doc

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:

Alan S. Rosenthal, Chair
Dr. Paul B. Abramson
Dr. Richard F. Cole

In the Matter of	)	Docket No. 40-8838-MLA
	)	
U.S. ARMY	)	ASLBP No. 00-776-04-MLA
	)	
(Jefferson Proving Ground Site)	)	January 24, 2007
	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the ARMY'S DISCLOSURES PURSUANT TO 10 CFR § 2.336 filed on January 24, 2007 in the above-captioned proceeding have been served on the following persons by U. S. Mail, first class, and (as indicated by asterisk) by e-mail this 24th day of January, 2007:

Administrative Judge Alan S. Rosenthal, Chair*
Atomic Safety and Licensing Board Panel
U. S. Nuclear Regulatory Commission
Mail Stop: T-3F23
Washington, D.C. 20555-0001
E-mail: rsnthl@comcast.net

Administrative Judge Paul B. Abramson,*
Atomic Safety and Licensing Board Panel
U. S. Nuclear Regulatory Commission
Mail Stop: T-3F23
Washington, D.C. 20555-0001
E-mail: pba@nrc.gov

Administrative Judge Richard F. Cole*
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Mail Stop: T-3F23
Washington, DC 20555-0001
E-mail: rfc1@nrc.gov

Adjudicatory File
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Mail Stop: T-3F23
Washington, DC 20555-0001

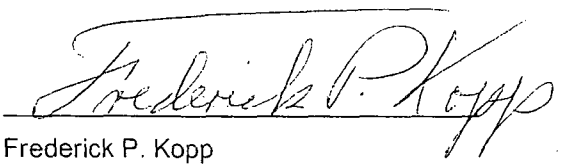
Debra Wolf *
Atomic Safety and Licensing Board
U.S Nuclear Regulatory Commission
Mail Stop: T-3F23.
Washington, DC 20555-0001
E-mail: daw1@nrc.gov

Office of the Secretary *
Attn: Rulemaking & Adjudications Staff
U.S. Nuclear Regulatory Commission
Mail Stop: O-16C1
Washington, DC 20555-0001
E-mail: HEARINGDOCKET@nrc.gov

Marian Zobler, Esq. *
David E. Roth, Esq. *
Office of General Counsel
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: MLZ@nrc.gov
DER@nrc.gov

Michael A. Mullett, Esq.*
Mullett, Polk & Associates, LLC.
309 West Washington Street
Suite 233
Indianapolis, IN 46204-2721
E-mail: mmullett@mullettlaw.com

Dated: January 24, 2007.



Frederick P. Kopp
Counsel
U. S. Army Garrison - Rock Island Arsenal
Office of Counsel (AMSTA-RI-GC)
One Rock Island Arsenal Place
Rock Island, IL 61299-5000
Phone: (309) 782- 7951
FAX: (309) 782-3475
E-mail: koppf@ ria.army.mil