DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

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June 17, 2008

Ms. Cheryl Prowell
California Environmental Protection Agency
California Regional Water Quality Control Board
Mitigation & Cleanup Unit
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Mr. Tayseer Mahmoud
California Environmental Protection Agency
Department of Toxic Substances Control
Office of Military Facilities
5796 Corporate Avenue
Cypress, CA 90603

Mr. Martin Hausladen
U. S. Environmental Protection Agency
Region IX, Code SFD-8-B
75 Hawthorne Street
San Francisco, CA 94105-3901

Subject: FINAL EXPLANATION OF SIGNIFICANT DIFFERENCE (ESD) FOR OPERABLE UNIT 3 RECORD OF DECISION, SITE 1A, CAMP PENDLETON

Dear Ms. Prowell, Mr. Mahmoud, Mr. Hausladen:

The Navy transmits the final, signed document and responses to your comments as approved by you for your files. The Navy appreciates your team work in getting this site to the Remedial Action stage. Should you have questions, please call me at (619) 532-1502

Sincerely,

Theresa L Morley

THERESA MORLEY
Lead Remedial Project Manager
By direction of the Commander

Copy to: CG, MCB Camp Pendleton (Attn: ACOS, Environmental Security - Mr. Rick Bottoms)

Naval Facilities Engineering Command Southwest
1220 Pacific Highway, San Diego, California 92132-5190

FINAL

EXPLANATION OF SIGNIFICANT DIFFERENCE FOR OPERABLE UNIT 3 RECORD OF DECISION

INSTALLATION RESTORATION SITE 1A MARINE CORPS BASE CAMP PENDLETON, CALIFORNIA

MARCH 17, 2008

AUTHORIZING SIGNATURES

FOR THE UNITED STATES MARINE CORPS, MARINE CORPS BASE CAMP PENDLETON:

Signature: _____ Date: 17 Apr 2008

James B. Seaton III
Colonel, United States Marine Corps
Commanding Officer, Marine Corps Base Camp Pendleton

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Signature: _____ Date: May 27/2008

Michael M. Montgomery
Chief, Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency, Region IX

FOR THE STATE OF CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY:

Signature: _____ Date: 5/30/08

John E. Scandura
Performance Manager,
Brownfields and Environmental Restoration Program – Cypress Office
Department of Toxic Substances Control

Signature: _____ Date: 6/12/08

John H. Robertus
Executive Officer,
California Regional Water Quality Control Board,
San Diego Region

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ACRONYMS AND ABBREVIATIONS

AR	Administrative Record
bgs	below ground surface
BMPs	best management practices
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
DLM	Designated Level Methodology
DoN	Department of the Navy
DTSC	California Department of Toxic Substances Control
EPC	exposure point concentration
ERA	ecological risk assessment
ES	Environmental Security
ESD	Explanation of Significant Difference
FFA	Federal Facilities Agreement
FS	Feasibility Study
GDIT	General Dynamics Information Technology
GPS	global positioning system
HHRA	human health risk assessment
HQ	Hazard Quotient
IDW	investigation-derived waste
IR	Installation Restoration
IT	International Technology Corporation
JEG	Jacobs Engineering Group, Inc.
LUCs	Land Use Controls
MCB	Marine Corps Base
MCL	maximum contaminant level
μg/L	micrograms per liter
NAVFAC SW	Naval Facilities Engineering Command Southwest
NCP	National Oil and Hazardous Substances Contingency Plan
OSWER	(US EPA) Office of Solid Waste and Emergency Response
OU	operable unit

PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
PWC	Navy Public Works Center
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RGs	remediation goals
RI	Remedial Investigation
ROD	Record of Decision
ROICC	Resident Officer In Charge of Construction
RSO	Range Safety Officer
RWQCB	California Regional Water Quality Control Board
SVOC	semivolatile organic compound
SWDIV	Southwest Division, Naval Facilities Engineering Command
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCE	trichloroethylene or trichloroethene
TEQ	toxicity equivalent
TRV	toxicity reference value
UCL	upper confidence limit
USC	United States Code
US EPA	United States Environmental Protection Agency
VOC	volatile organic compound
yd^3	cubic yards

1.0 INTRODUCTION

1.1 Site Name and Location

Installation Restoration (IR) Site 1A, Refuse Burning Grounds
14 Area, Marine Corps Base (MCB) Camp Pendleton
San Diego County, California

1.2 Lead and Support Agencies

- U.S. Department of the Navy (DoN) – Lead Federal Agency
- U.S. Environmental Protection Agency (US EPA) – Lead Regulatory Agency
- California EPA Department of Toxic Substances Control (DTSC) – Lead State Agency
- California EPA Regional Water Quality Control Board (RWQCB) – State Support Agency.

The MCB Camp Pendleton IR Program is governed by a Federal Facilities Agreement (FFA) signed by the above agencies on October 24, 1990. The aforementioned lead and support agencies comprise the MCB Camp Pendleton FFA Team. The DoN maintains responsibility for the assessment and remediation of IR sites at MCB Camp Pendleton, with support from the FFA team. The US EPA provides regulatory oversight with advice from the state agencies.

1.3 Summary of Need for ESD

The Record of Decision (ROD) for Operable Unit (OU) 3, including IR Site 1A, was signed March 31, 1999 [Southwest Division, Naval Facilities Engineering Command (SWDIV), 1999]. This Explanation of Significant Difference (ESD) is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §117 (c), 42 United States Code (USC) §9617 (c) and the National Oil and Hazardous Substances Contingency Plan (NCP) 40 Code of Federal Regulations (CFR) §300.435 (c)(2)(i), because significant changes to the remedy specified in the OU3 ROD are now planned.

The purpose of this ESD is to document the significant changes to the remedy outlined in the OU3 ROD for IR Site 1A. As such, this ESD will:

- Acknowledge that based on historical analytical results and interpretation from groundwater monitoring, chemicals of concern (COCs) in remaining burn ash waste do not appear to be impacting groundwater upgradient or downgradient of the site and TCE detected in interior piezometer wells does not appear to be migrating off site;
- Document the recalculated volume of remaining burn ash waste based on available historical data and information from recent trench sampling activities;
- Document the revised remediation goals (RGs) for COCs, based on recently developed values from an adjacent site (IR Site 1A-1) historically associated with IR Site 1A, that must be attained to warrant unrestricted land use;
- Acknowledge that following continued remedial action activities, if revised RGs and/or acceptable risk values are attained, no further action with unrestricted land use is an appropriate alternative for IR Site 1A;

- Acknowledge that if revised RGs are not attained and localized exceedances are identified following removal of the recalculated volume of remaining burn ash waste, then the remedial action will be continued until revised RGs are attained to the extent practicable;
- Acknowledge that if revised RGs are not attainable or practicable, then site risk will be recalculated and a risk management decision will be made for the site.

In accordance with NCP 40 CFR §300.435 (c)(2)(i), an ESD is required when new information is discovered after the adoption of the ROD that causes the lead agency to reevaluate and change the remedial action if this change differs significantly from the ROD, but does not fundamentally alter the remedy selected in the ROD with respect to scope, performance, and cost. This ESD is necessary because the OU3 ROD called for the excavation of 31,700 cubic yards (yd^3) of metal-contaminated soil and burn ash material at IR Site 1A, with on-base disposal at the Box Canyon Landfill Corrective Action Management Unit (CAMU). Following excavation, the site was to be regraded with clean fill to original contour and revegetated. During the remedial excavation in 1999, because of the discovery of a waste mound and five, large fully-buried burn pits/cells, approximately 93,000 yd^3 of contaminated soil and burn ash material were removed. Excavation activities were suspended in August 1999 due to the presence of groundwater in the excavation pit and the need to winterize the site before the rainy season. In April 2000, the Commanding General of MCB Camp Pendleton directed closure of the CAMU as part of the Box Canyon Landfill closure activities, thus requiring a new disposal site or remedial alternative for the remaining impacted soil at IR Site 1A. The OU3 ROD contains a provision for contaminated material remaining in place, stating that the areas will be backfilled with a minimum of 10 feet of clean soil if contaminant concentrations at 10 feet below ground surface (bgs) still exceed RGs. However, the OU3 ROD did not address management of groundwater or land-use controls (LUCs), which would have been required if contaminated material was left in place. The current plan calls for the removal and off-base disposal of remaining contaminated material so that long-term groundwater monitoring for burn ash related COCs and LUCs will not be required.

1.4 Administrative Record

This ESD will become part of the Administrative Record (AR) for IR Site 1A, in accordance with NCP 40 CFR §300.825(a)(2). The AR contains all information, data, and documents used to support the selection of the remedy for IR Site 1A. It is the stand-alone legal source of information on the site. All documents supporting the remedial action decisions for IR Site 1A are located at Naval Facilities Engineering Command Southwest (NAVFAC SW), and are available for review between 0830 and 1630 Monday through Friday. Advance scheduling to review documents is requested, or a request for copies may be sent in accordance with the Freedom of Information Act. The AR Point of Contact is as follows:

Ms. Diane Silva
CERCLA Administrative Records Coordinator
Naval Facilities Engineering Command Southwest
937 North Harbor Drive, Building 1

San Diego, CA 92132
(619) 532-3676
diane.silva@navy.mil

1.5 Regulatory Guidance

The DoN prepared this ESD in accordance with the following regulations and guidance:

- National Contingency Plan 40 CFR, Part 300.
- *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents.* July 1999. US EPA, EPA 540-R-98-031, Office of Solid Waste and Emergency Response (OSWER) 9200.1-23P.
- *Guide to Addressing Pre-ROD and Post-ROD Changes*. April 1991. US EPA, EPA Publication 9355.3-02FS-4. OERR OS-220W.

2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 Site History

IR Site 1A was used for refuse burning between 1942 and the early 1970s. The site was first identified during an Initial Assessment Study published in 1984. The chronology of Site 1A actions to date is presented in Table 1.

2.2 Physical Setting

IR Site 1A comprises a 7-acre area located on the floor of a narrow valley situated in the 14 Area of MCB Camp Pendleton (Figures 1 and 2). IR Site 1A, the Refuse Burning Grounds, is bounded to the east by Pilgrim Creek (a seasonally intermittent stream) and to the west by a narrow unnamed valley.

2.2.1 Geology

Previous geologic investigations indicate that the site is underlain by alluvium to a maximum depth of approximately 30 feet bgs. The alluvium generally consists of silt, sandy silt, and poorly graded sand. Based on the seismic refraction survey performed in November 1999, the alluvium overlies granitic bedrock at widely varying depths [International Technology Corporation (IT), 2002]. The bedrock that underlies IR Site 1A consists of pre-Tertiary basement complex composed of igneous rocks; predominantly coarse to medium grained hornblende-biotite granodiorite (Walawender, 1975).

2.2.2 Hydrogeology

The Pacific Ocean is located approximately 9 miles to the west. Pilgrim Creek forms the eastern boundary of Site 1A. According to the California RWQCB "Water Quality Control Plan for the San Diego Basin (9)" (1994), the site is located within the boundary of the San Luis Rey Hydrologic Unit (3.00) in the Lower San Luis Hydrologic Area (3.10) and in the Mission Hydrologic Subarea (3.11). Beneficial uses for groundwater have been designated for this Subarea for municipal, agricultural, and industrial purposes. Beneficial uses also exist for the surface waters of nearby Pilgrim Creek (RWQCB, 1994).

The nearest groundwater production wells to IR Site 1A are over four miles downgradient from the site in the San Luis Rey River Basin. Two production wells (Wells 4 and 5) in the San Luis Rey River Valley are located near the intersection of North River Road and College Boulevard in the City of Oceanside.

Groundwater levels have been monitored at IR Site 1A using eight piezometer wells installed in November 1999 and four groundwater monitoring wells installed in June/July 2000. Groundwater depths at the site have varied depending on precipitation totals for the season and the time of year measured. Depth to groundwater (from the top of the monument well casing) in the groundwater monitoring wells has ranged from 3.45 feet bgs (April 2003, Well 1A-02) to 17.08 feet bgs (October 2002, Well 1A-04). The data indicate that groundwater in the shallow alluvium is directly recharged by runoff that accumulates in the valley and percolates into the sandy subsurface. In general, groundwater in the shallow alluvium flows towards the southwest, with an average magnitude of approximately 0.012 foot per foot [Navy Public Works Center, San Diego (PWC), 2003].

Comparison of groundwater elevation data between the sampling event in October 2002 until the final sampling event in 2003 indicates that, in general, water levels have shown an increasing trend across the site. During that time, water levels displayed a maximum elevation change between approximately 7.0 and 11.5 feet. The greatest groundwater elevation change was an 11.56 foot increase, observed in monitoring Well 1A-01.

2.3 Remedial Investigation/Feasibility Study

A Remedial Investigation (RI) and Feasibility Study (FS) were conducted to characterize the nature and extent of environmental contamination from past activities at the site, quantify risks to potentially exposed human and ecological receptors posed by the contamination, and determine the preferred remedial action. A Phase I RI was conducted during June and July 1996 and a Phase II RI was conducted from May through June 1997 at Site 1A. Detailed results of the Phase I and Phase II RIs are presented in the Draft Final Group D RI Report [Jacobs Engineering Group, Inc. (JEG), 1997] and the Draft Final RI/FS for OU3 (IT, 1998), respectively. The results of these investigations are summarized in this section.

The Phase I RI included the advancement of six soil borings, from which 18 soil samples were collected and analyzed. Soil samples were analyzed for metals, molybdenum, chromium VI, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs), and dioxins and furans. During the Phase II RI, 2 surface soil samples were collected and analyzed for metals and molybdenum, and lettuce and earthworm bioassay studies were performed.

Based on Phase I and II analytical results, the Site 1A COCs included various metals that were detected in soil above the established cleanup standards. These metals include antimony, arsenic, barium, boron, chromium, copper, iron, lead, manganese, mercury, thallium, vanadium, and zinc. The contaminant leaching potential using Designated Level Methodology (DLM) was performed on the soil COCs. Although the DLM indicated that lead in the soil could pose a potential threat to groundwater, groundwater

sampling was not planned at Site 1A for the RI because, at that time, the water table was believed to be deeper than 50 ft bgs.

However, during the OU3 RI, groundwater was encountered at a depth of approximately 5.5 ft bgs at Site 1A; therefore, one temporary well (1AGWT-01) was installed adjacent to 1AB-01 to evaluate the potential for groundwater contamination. A groundwater sample was collected at the water table and analyzed for metals, molybdenum, chromium VI, VOCs, SVOCs, and general chemistry. The RI indicated that groundwater below the site was not impacted by the analyzed COCs, with the exception of manganese (JEG, 1997). The high levels of manganese in soil are believed to be naturally occurring, which contributes to the elevated levels historically detected in groundwater at MCB Camp Pendleton (IT, 2002).

2.4 Record of Decision

A ROD for OU3, including IR Site 1A, was signed by the US EPA, DTSC, RWQCB, and the Department of the Navy, specifically MCB Camp Pendleton, representatives in early 1999 (SWDIV, 1999). Human health and ecological risk assessments were performed for IR Site 1A as part of the RI/FS for OU3. Results of the risk assessment were used in determining the cleanup levels presented in the OU3 ROD. Remedial action standards were established for soil from 0 to 5 feet bgs to protect ecological receptors and from 5 to 10 feet bgs to address human health concerns. The OU3 ROD contains a provision for contaminated soil remaining in place, stating that the areas will be backfilled with a minimum of 10 feet of clean soil if contaminant concentrations at 10 feet bgs still exceed RGs. The OU3 ROD did not address management of groundwater or LUCs if contaminated material would have been left in place (SWDIV, 1999). Specifically, the OU3 ROD included the following major components:

- Excavation and on-base disposal at Box Canyon Landfill CAMU of an estimated 31,700 yd^3 of contaminated soil and burn ash material. Excavation depths were to be 5 feet for protection of ecological receptors and 10 feet for protection of human health.
- Backfilling and regrading the site to the original contours, including revegetation of the excavated area.
- No further action for soil or groundwater pending excavation and disposal of contaminated material.

2.5 Remedial Action

In May 1999, a Remedial Design and Work Plan were prepared by OHM Remediation Services Corp (OHM, 1999) to excavate the burn debris and affected soil from Site 1A to meet the Remedial Action Objectives (RAOs) as specified in the OU3 ROD.

In August 1999, IT Corporation initiated remedial action activities. The remedial action was based on the conclusion in the ROD that impact at the site was limited to soil only. The affected soil was to be disposed of at the CAMU located on the Box Canyon Landfill. The discovery of a waste mound and five large burn pits/cells at the site was reported (IT, 2002).

Perimeter soil samples were collected prior to the remedial action to determine the excavation boundary. Additional step-out samples were collected based on pre-excavation results. A total of 56 excavation floor confirmation samples were collected from a grid across the site as visible burn ash debris was removed. Samples were not collected from 10 grid locations due to the presence of visible burn ash on the excavation floor. Perimeter and excavation confirmation samples expanded the site boundary both laterally and vertically. Excavation perimeter and floor sample locations are presented on Figure 3. The original volume of waste (31,700 yds^3) had been estimated based on surface mapping conducted during the 1997 RI and did not account for the additional volume (approximately 96,119 yds^3) of buried waste (IT, 2002).

In November 1999, after removing approximately 93,000 yds^3 of burn ash and impacted soil, excavation activities were suspended due to the presence of groundwater in the excavation pit and the need to winterize the site before the rainy season (IT, 2002). A portion of the remaining waste (estimated at 50,000 yds^3) appeared to be in contact with groundwater based on visual observations during excavation activities (OHM, 2000). In anticipation of possible dewatering in the spring of 2000, when excavation would resume, eight 2-inch diameter piezometer wells (GMW-01 through GMW-08) were installed at the site on November 4, 1999. In addition, to control groundwater recharge during the rainy season, a sheetpile dam was installed on February 4, 2000 at the northern upstream end of the site (Figure 2). Site winterization was completed in February 2000, which included the addition of a runoff protection berm to enclose the site preventing off-site surface runoff from entering the site, and to contain on-site surface runoff from leaving the site (IT, 2002).

3.0 BASIS FOR ESD

Following suspension of remedial excavation activities, it was estimated that a six-foot thick layer of burn ash waste, making up approximately 50,000 yds^3, remained at the site. A portion of the remaining waste appeared to be beneath the groundwater table (OHM, 2000). In April 2000, the Commanding General of MCB Camp Pendleton directed the closure of the CAMU at the Box Canyon Landfill, thus requiring a new disposal or remedial alternative for the remaining impacted soil.

In an October 2001 meeting, the FFA team agreed that the remedy selected in the OU3 ROD had been implemented, but questions remained regarding protectiveness of the remedy because of the greater depth and volume of burn ash material discovered, and the potential groundwater impact. The OU3 ROD does not address management of groundwater or LUCs, which would have been required if contaminated material was left in place.

3.1 Groundwater Monitoring Program

To address concerns expressed by members of the FFA team regarding remaining waste being in contact with groundwater, it had been determined at the May 15, 2000 FFA meeting that groundwater monitoring was warranted. In support of this agreement, a groundwater monitoring program was initiated.

In June and July 2000, four groundwater monitoring wells were installed, extending to depths of approximately 25 feet bgs. One well (Monitoring Well 1A-01) was installed upgradient of the impacted area and three wells (Monitoring Wells 1A-02 through 1A-04) were installed downgradient of the site remedial excavation limits (Figure 2). In addition, a seismic refraction survey was performed to assess the depth to bedrock (IT, 2002).

A total of 10 groundwater sampling events (9 quarterly events and 1 interim event) were conducted at the site between July 2000 and June 2003. Results for the first five events (July 13, 2000; August 3, 2000; August 21, 2000; March 21, 2001; and August 29, 2001) are presented in the *Summary of Annual Groundwater Sampling Results IR Site 1A MCB Camp Pendleton, CA* (IT, 2002). Results for the sixth and seventh events (July 24 and 25, 2002; and October 22 and 24, 2002) are presented in the *Final Technical Memorandum*, *Summary of Annual Groundwater Sampling Results, July and October 2002, IR Site 1A MCB Camp Pendleton, CA* (PWC, 2003). Results for the eighth, interim, and ninth events (March 5 through 7, 2003; May 1, 2003; and June 24 and 25, 2003) are presented in the *Final Technical Memorandum, Summary of Groundwater Sampling Results, March, May, and June, 2003, IR Site 1A, MCB Camp Pendleton, CA* (PWC, 2004).

Analytical results indicate that SVOCs, organochlorine pesticides, and polynuclear aromatic hydrocarbons (PAHs) were not detected in groundwater from any of the wells sampled at the site during the 10 events. VOCs were not detected in groundwater from the four perimeter groundwater monitoring wells (Monitoring Wells 1A-01 through 1A-04) during the 10 events. However, trichloroethylene (TCE) was detected in groundwater collected from piezometer wells GMW-6 and GMW-8, located within the interior of the site. TCE was detected in groundwater samples collected from well GMW-6 above the maximum contaminant level (MCL) in March and May 2003 [at 17 and 8.4 micrograms per liter (μg/L), respectively], and below the MCL in June 2003 (at 3.0 μg/L). In groundwater samples collected from well GMW-8, TCE was detected below the MCL in May and June (at 3.8 μg/L). Based on these results, TCE detected in interior piezometer wells GMW-6 and GMW-8 does not appear to be migrating off site (PWC, 2004).

Several concentrations of dissolved metals above the primary and secondary MCLs have been detected in groundwater samples collected during the 10 monitoring events since sampling began in July 2000. These metals include: dissolved iron (Well 1A-02 in July 2000 and piezometer GMW-6 in June 2003); dissolved lead (Well 1A-02 in July 2000); and dissolved manganese (all wells sampled at various dates). Well 1A-02 had both dissolved lead and dissolved iron above the primary or secondary MCL in the first sampling event in July 2000. During subsequent sampling events, the concentrations within the well have decreased and/or were both not detected above the laboratory reporting limits. Dissolved iron, above the secondary MCL detected in piezometer well GWM-6 during the June 2003 event is suspected to be representative of the total iron concentration due to inadvertent sample collection without filtering. Dissolved manganese was detected above the secondary MCL in several groundwater samples collected both upgraidient and downgradient from the site during various monitoring events. The high levels of manganese in soil are believed to be naturally occurring,

which contributes to the elevated levels historically detected in groundwater at MCB Camp Pendleton (IT, 2002).

Because the general chemistry results do not indicate any significant variations in groundwater quality between groundwater in the upgradient and downgradient wells at the site, the wells appear to be hydraulically connected (PWC, 2004).

Based on the historical analytical results and interpretation, the burn ash-affected soil left in place following the remedial action does not appear to be affecting the groundwater quality in the upgradient or downgradient perimeter groundwater monitoring wells (1A-01 through 1A-04) for any of the analyzed constituents (PWC, 2004). TCE detected in interior piezometer wells GMW-6 and GMW-8 does not appear to be migrating off site.

3.2 Trench Sampling Activities (2006)

In November 2006, the Navy proposed trench sampling activities in correspondence to the FFA team to obtain a more accurate estimate of the volume of remaining burn ash material. On December 20 and 21, 2006, General Dynamics Information Technology (GDIT) and West Coast Environmental conducted trench sampling at IR Site 1A to assess the extent of burn ash and refine the volume of burn ash material remaining in the subsurface. This section presents a summary of the field methods and investigation results.

3.2.1 Trench Sampling Mobilization Activities

Prior to initiation of fieldwork, the MCB Camp Pendleton Facilities Maintenance Department Utility Locator Service and Underground Service Alert were notified to confirm that no underground utilities were located in the planned trenching areas. MCB Camp Pendleton Environmental Security (ES), Range Safety Officer (RSO), and Resident Officer In Charge of Construction (ROICC) were also notified of planned activities and work schedules.

A geophysical survey was conducted by Underground Locator Services to identify underground utilities and geophysical anomalies. The geophysical survey identified several anomalies, which were further assessed during field activities.

Heavy equipment was mobilized to the site by West Coast Environmental. The site was secured, and applicable best management practices (BMPs) for stormwater were implemented. All activities were engineered to minimize impact to natural resources, including vegetation, vernal pools, wildlife, and habitat.

3.2.2 Trenching and Soil Sampling

On December 20 and 21, 2006, a total of 21 test pits were excavated using a backhoe, and 22 soil samples were collected at select locations. Trench sidewalls were inspected for visible burn ash or waste material, and paired soil samples were collected from select trenches. Soil sample pairs included one sample collected from both within visible burn ash and a second sample collected from the same trench outside of the visually observed burn ash to confirm the extent of remaining waste. Soil samples were collected directly into 2-ounce glass sample containers from the excavation floor to minimize decontamination waste. Slough was avoided to obtain a representative discrete sample

from the target depth and location. All excavated material was backfilled directly into the test pit of origin directly following sample collection activities. Test pit locations are presented on Figure 4.

3.2.3 Trench Sampling Analytical Methods

Following collection, soil samples were transported to a stationary laboratory for analysis. All soil samples were analyzed for lead using US EPA Method 6020, since it has historically proven to be a good indicator parameter for burn ash waste. Trench sampling analytical results and interpretation are available in Section 3.2.7. The laboratory analytical report is available in Appendix A.

3.2.4 Trench Sampling Investigation-Derived Waste Management

Since soil samples were collected directly into individual sample containers, and all excavated material was backfilled directly into the test pit of origin, no investigation-derived waste (IDW) was generated during field activities. Non-hazardous solid waste, such as personal protective equipment, was bagged and disposed of as solid waste with other trash generated at MCB Camp Pendleton.

3.2.5 Trench Location Survey

A Trimble® global positioning system (GPS) with sub-foot accuracy was used to survey the test pit boundaries following soil sampling activities. The test pit locations are presented on Figure 4.

3.2.6 Trench Sampling Field Results

A total of 21 test pits were excavated to depths ranging from 1.5 to 7.0 feet bgs to assess the extent of burn ash material. Groundwater was encountered at approximately 5.0 feet bgs during trenching. Test pit locations were selected based on historical analytical results and positioned within the site area to minimize habitat and vegetation impacts. Burn ash was visually observed in 11 of the 21 test pits at thicknesses ranging between approximately 1 to 6 feet. A dark colored organic layer, believed to be decomposed vegetation (or humus), was observed in Test Pits 15 and 16 at thicknesses of 3 feet and 1 foot, respectively. No burn ash or organic layer was observed in eight test pits. Fragments of three decomposed drums, surrounded by a small volume of solid mottled white and gray colored ash, were uncovered in Test Pit 17 where a geophysical anomaly was detected during utility clearance activities. Because of the drums and presence of groundwater within the test pit, the vertical extent of burn ash could not be delineated in Test Pit 17. Since additional remedial excavation activities were planned, all excavated material, including the decomposed drum fragments, was backfilled directly into the test pit of origin directly following sample collection activities. Test pit locations and observed burn ash thicknesses are presented on Figure 4.

3.2.7 Trench Sampling Laboratory Analytical Results

A total of 22 soil samples were collected to assess the extent and refine the volume of burn ash material remaining in the subsurface at IR Site 1A. The soil sampling locations were selected in the field based on physical observations during excavation. Soil samples were collected at select locations from within and outside of the visually observed burn

ash. Some test pits were only visually logged. On December 21, 2006, soil samples were submitted to a certified analytical laboratory (EMAX Laboratories, Inc.) for lead analysis using US EPA Method 6020. Analytical results indicated that lead was detected in all nine samples collected from within the burn ash material. The maximum lead concentration reported was 1,450 mg/kg in a sample collected from Test Pit 8. Lead was not detected above the California EPA preliminary remediation goal (PRG) for residential soil (130 mg/kg) in any soil sample collected from locations where burn ash was not visually observed during trenching. Analytical results are presented in Table 2. The estimated extent of burn ash encountered during trench sampling is presented on Figures 4, 5, and 6.

3.3 Revised Remediation Goals

Human health and ecological risk assessments were performed for IR Site 1A as part of the OU3 RI/FS. The 95 percent upper confidence limit (UCL) was calculated for each chemical of potential concern (COPC), and used as the exposure point concentration (EPC) to calculate risk in accordance with the US EPA Supplemental Guidance to Risk Assessment Guidance for Superfund (RAGS) (US EPA, 1992). Results of the risk assessment were used in determining the COC and remedial goals presented in the OU3 ROD (SWDIV, 1999). Remediation Goals were established for soil from 0 to 5 feet bgs to protect ecological receptors and from 5 to 10 feet bgs to address human health concerns. The intent of the 1999 remedial action was to excavate burn debris and affected soil to meet the Remedial Action Standards or to a maximum depth of 10 feet bgs if the affected soil could not be effectively removed. The OU3 ROD contains a provision for leaving burn ash material in place at IR Site 1A; however, it does not address management of groundwater or LUCs. LUCs for IR Site 1A were not deemed necessary in the ROD because the selected alternative attained RAOs protective of human health and the environment.

Revised RGs conforming to updated ecological risk guidance are proposed to support continuing the remedial action at IR Site 1A. The purpose of the proposed remedial action is to excavate remaining burn ash and related COCs in soil to levels that would protect human health and the environment, as well as allow unrestricted site use following completion. Rationale for the proposed RGs is discussed below.

IR Site 1A-1 is a debris and waste disposal area located approximately 800 ft northeast of IR Site 1A. It is believed to be associated with operations performed at IR Site 1A (Parsons, 2004). As agreed upon by the FFA Team, because of the proximity of the sites and the nature of contaminates, the revised RGs for IR Site 1A were derived using the same rationale that were used to calculate the RGs for IR Site 1A-1 in the OU5 FS. Using the identical exposure algorithms and the toxicity reference values (TRVs) used in the OU5 Tier-2 baseline ecological risk assessment (ERA), risk-estimation equations can be back-calculated to derive soil concentrations that resulted in a Tier-2 hazard quotient (HQ) value equal to the indicator threshold of 1.0. This process is simply the reverse of the "forward calculations" presented in the OU5 ERA, in which a soil concentration enters the equations and the risk estimate is the outcome. The value selected as the site- and chemical-specific ecological RG is the concentration that results in an HQ≤1 for all wildlife receptors, derived using as effect-based TRV.

In most cases, the lower value between the OU5 human health risk assessment (HHRA) and ERA PRGs was selected as the revised RG. In instances where this value was less than the San Luis Rey Basin background concentration value, the background concentration was selected as the revised RG. Proposed RGs for barium, chromium, copper, lead, manganese, mercury, vanadium, and zinc were selected based on the most conservative values from the IR Site 1A-1 HHRA and ERA. Proposed RGs for antimony, arsenic, and thallium were based on San Luis Rey Basin background concentrations. The proposed remediation goal for boron was retained from the OU3 ROD since it was not evaluated for IR Site 1A-1 in the OU5 RI/FS. Iron was removed as a COC since it is classified as an essential nutrient and measured concentrations were below levels considered potentially toxic for human and ecological receptors.

Since Site 1A is a burn ash site, and dioxins/furans are commonly associated with waste incineration, an RG for dioxins/furans as a 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) toxicity equivalent (TEQ) was also developed using the corresponding effects-based TRV.

The proposed rationale for calculation the revised RGs received concurrence from the FFA team on May 24, 2007. Risk exposure calculation tables are available in Appendix B. The revised RGs are presented in Table 3.

The 1999 excavation perimeter and floor confirmation sample results were evaluated based on the revised RGs. Excavation perimeter and floor soil sample analytical results are summarized in Table 4. The COCs in soil exceeding the revised RGs are presented on Figure 7.

3.4 Remaining Burn Ash Waste

Subsurface data collected during 2006 trenching activities, field mapping, and previous analytical data were used to estimate the extent and volume of remaining burn ash waste based on the revised RGs. The volume of remaining burn ash waste below the site was recalculated to be approximately 22,000 yds^3, assuming a uniform average of 4-foot average thickness (Figure 8).

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

The OU3 ROD contains a provision for contaminated soil remaining in place, stating that the areas will be backfilled with a minimum of 10 feet of clean soil if contaminant concentrations at 10 feet bgs still exceed RGs. Although the FFA team agreed that the remedy selected in the OU3 ROD had been implemented, the OU3 ROD does not address management of groundwater or LUCs, which would have been required if contaminated material was left in place.

Based on the results of 10 groundwater sampling events subsequent to the 1999 remedial action, the burn ash-affected soil left in place does not appear to be affecting the groundwater quality in the upgradient or downgradient perimeter groundwater monitoring wells. TCE detected in interior piezometer wells GMW-6 and GMW-8 does not appear to be migrating off-site.

To obtain a more accurate estimate of the volume of remaining burn ash material, trench sampling was conducted at IR Site 1A in December 2006.

Revised RGs were implemented in May 2007 to conform to updated ecological risk guidance. Based on data collected during 2006 trenching activities, field mapping, and previous analytical data, the volume of remaining burn ash waste below the site exceeding revised RGs is estimated to be approximately 22,000 yds^3.

The purpose of the proposed remedial action is to excavate remaining burn ash and related COCs in soil to levels that would protect human health and the environment, as well as allow unrestricted site use following completion. Off-base disposal is now necessary due to the closure of the Box Canyon CAMU. Following continued remedial action activities, excavation floor confirmation sample analytical results will be evaluated in conjunction with the current data set. Following removal of all COCs above the revised RGs, site closure with unrestricted land use will be recommended.

Initial excavation, on-base disposal, and site restoration activities were planned for a nine week duration, commencing in August 1999. The IR Site 1A remedial schedule will be extended through 2008, with continued remedial action activities planned to excavate the remaining burn ash waste containing COCs above the revised RGs.

A summary of the significant differences between the remedy presented in the OU3 ROD and the action now proposed is provided below:

Original Remedy	Modified Remedy
▪ Excavation of approximately 31,700 yd^3 of contaminated material containing COCs to depth of 5 feet to mitigate ecological risk and to 10 feet to mitigate human health risk. On-base disposal of excavated material at the Box Canyon Landfill CAMU.	▪ 93,000 yd^3 of contaminated material was excavated and disposed of on-base at the Box Canyon Landfill CAMU. Additional excavation and off-base disposal of an estimated 22,000 yd^3 of remaining contaminated material is planned.
▪ RGs based on the OU3 RI/FS Remedial Action Standards for IR Site 1A.	▪ Revised RGs based on the OU5 RI Preliminary Remediation Goals for unrestricted land use at IR Site 1A-1, as agreed in the May 24, 2007, FFA meeting, conforming to updated ecological risk guidance.
▪ Replacement with clean backfill, regrading and restoration of site to original contours, and revegetating.	▪ Replacement with clean backfill, regrading to an elevation that will prevent flooding across the site, and revegetating.
▪ $1.3 M cost; 9 week duration. Response complete 1999.	▪ Additional costs of approximately $5.7 M; response complete 2008.

Original Remedy (Continued)	Modified Remedy (Continued)
▪ No further action for groundwater. No long-term groundwater monitoring, no Five-Year Reviews.	▪ Groundwater monitoring (9 events and 1 interim event) was performed to assess the impacts of remaining burn ash material on groundwater. The burn ash-affected soil left in place does not appear to be affecting the groundwater quality in the upgradient or downgradient perimeter groundwater monitoring wells for any of the analyzed constituents and TCE detected in interior piezometer wells does not appear to be migrating off site.

5.0 SUPPORT AGENCY COMMENTS

A summary of support agency comments on the ESD will be included as they become available (Appendix C).

6.0 STATUTORY DETERMINATIONS

Considering the new information that has been obtained about the site since the OU3 ROD was signed and the changes that have been made to the selected remedy, these proposed significant differences are protective of human health and the environment. This ESD utilizes permanent remedial solutions to the maximum extent practicable for the site and is time- and cost-effective. The modified remedy satisfies CERCLA §121 and complies with the NCP and other Federal and State requirements identified in the OU3 ROD as applicable or relevant and appropriate to this remedial action at the time the OU3 ROD was signed.

7.0 PUBLIC PARTICIPATION COMPLIANCE

In accordance with the public participation requirements set forth in NCP §300.435(c)(2)(i), the DoN will publish a Notice of Availability and a brief description of this ESD in local newspapers. The ESD is available to the public in the AR (see page 2, Section 1.4) and the Information Repository located at the Oceanside Public Library. The ESD will also be mailed to individuals on the Technical Review Committee mailing list. The DoN will accept comments on the ESD for 30 days from the date of the Notice of Availability and will provide responses to any comments received from regulatory agencies and the public.

8.0 REFERENCES

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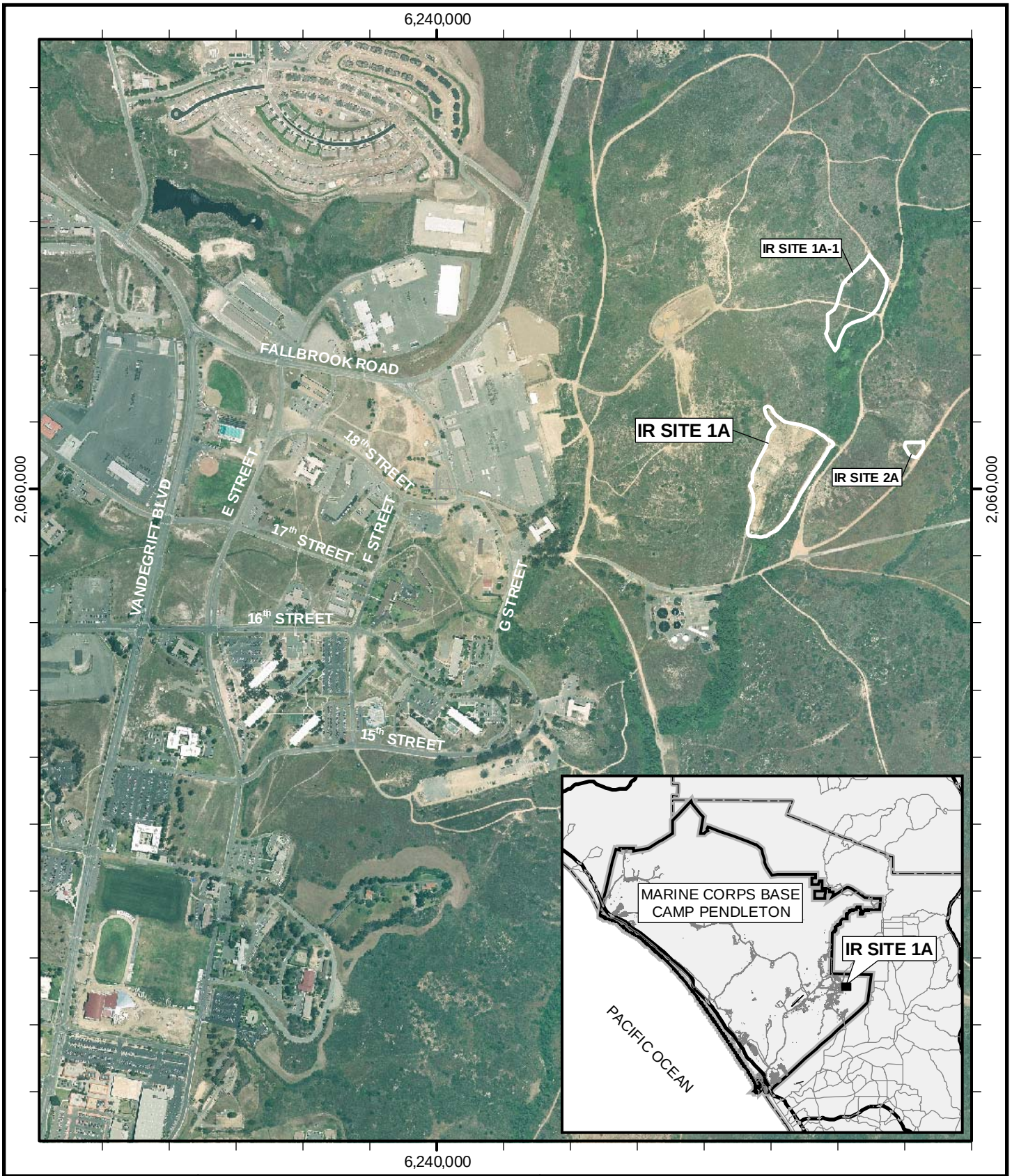
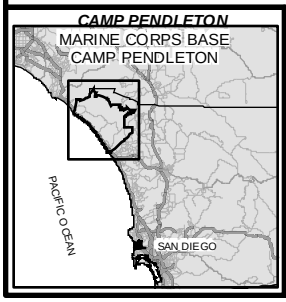
FIGURES





N

0 1,000 2,000

FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

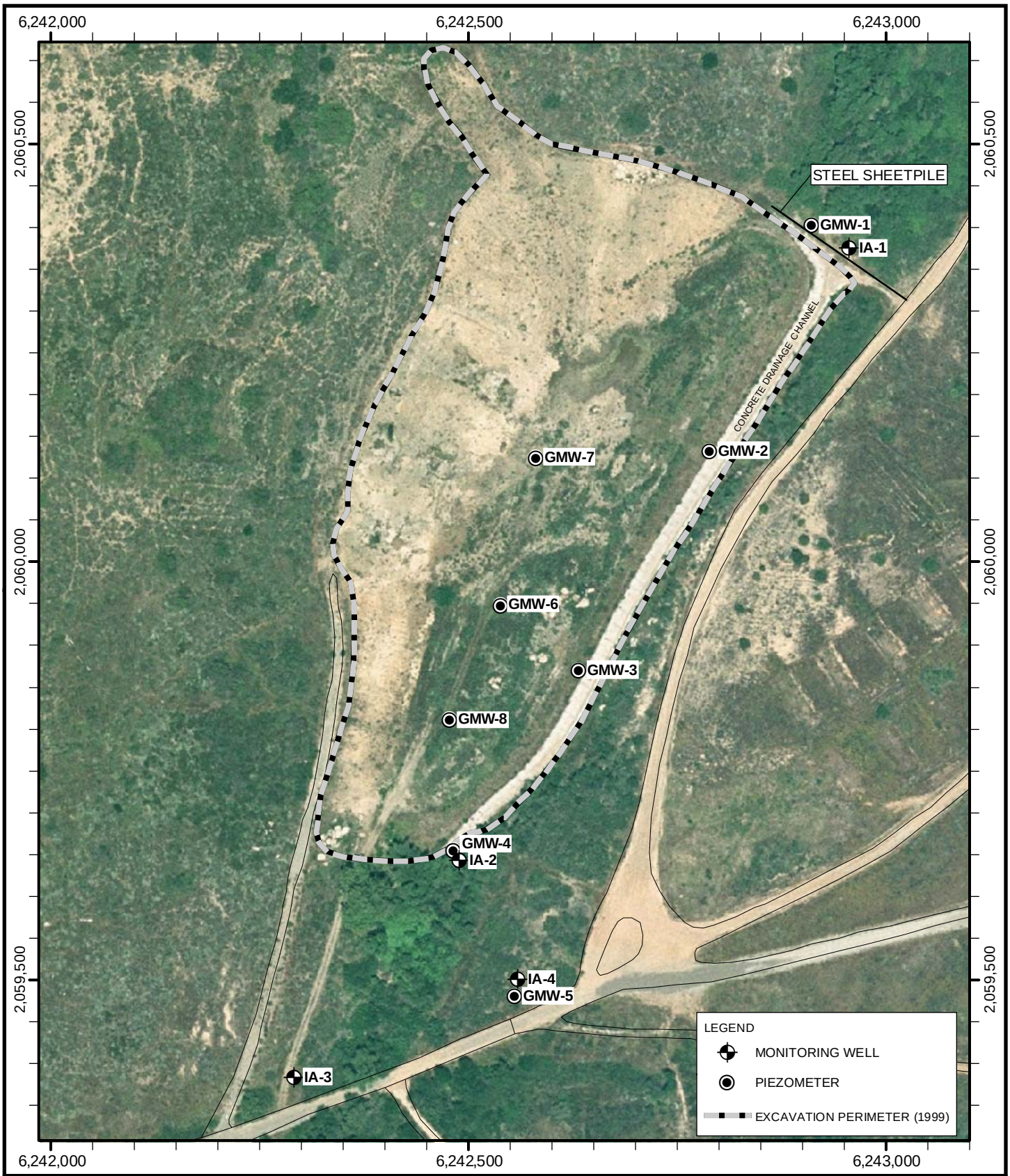
SITE LOCATION MAP

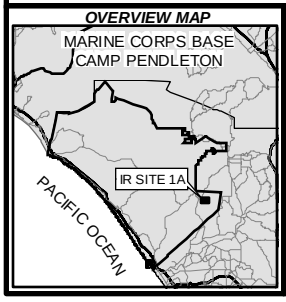
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Feb 20, 2008
FILE: CPenIR1A SitLocMap

FIGURE: 1





N

0 80 160 320

FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

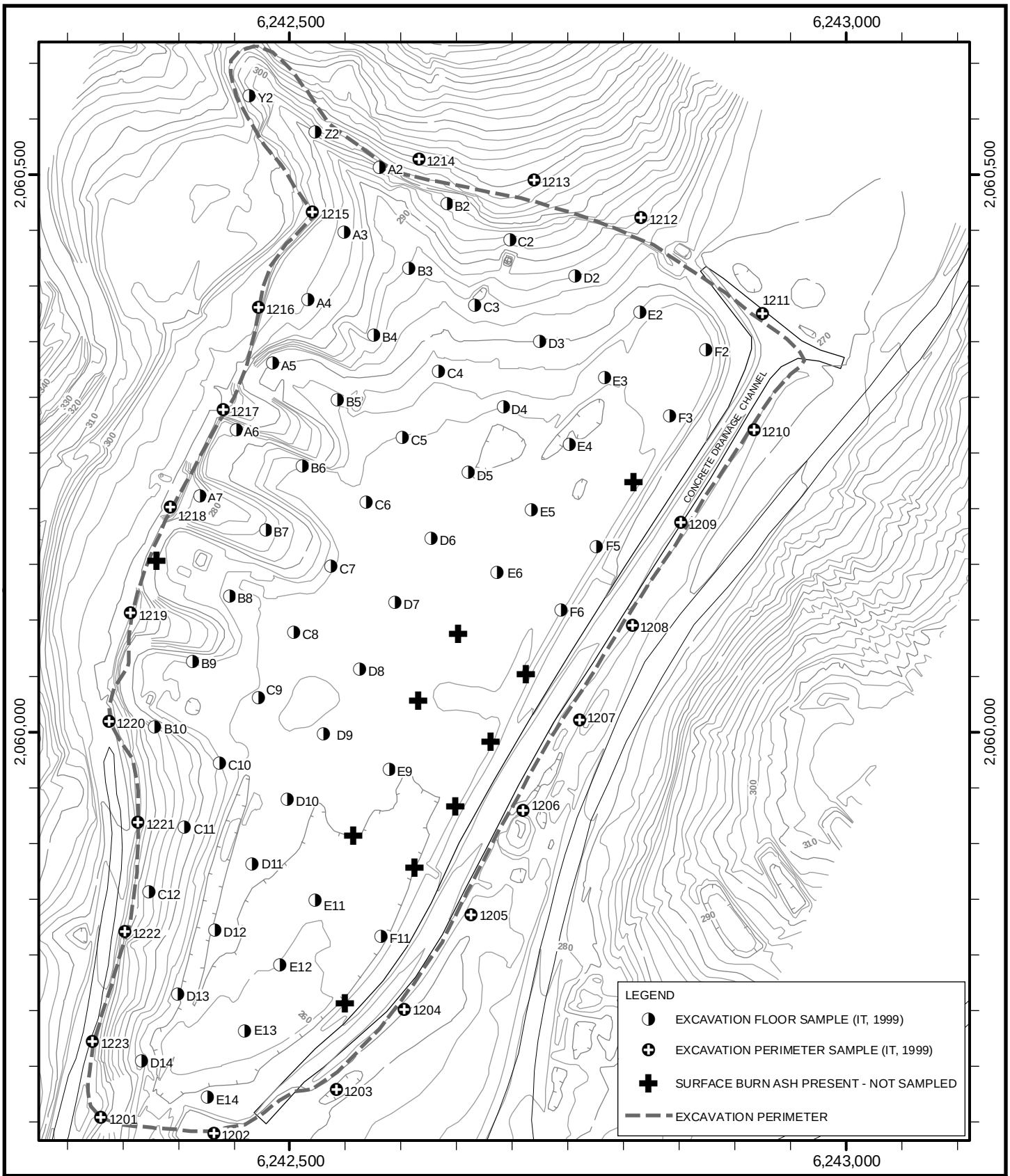
SITE PLAN

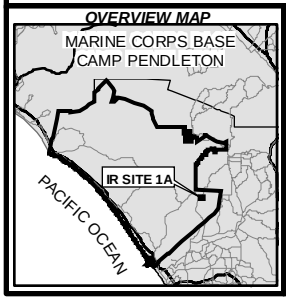
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Oct 12, 2007
FILE: CPen_IR_Site_1A 071012

FIGURE: 2





N

0 60 120 240

FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

EXCAVATION PERIMETER AND FLOOR SAMPLE LOCATIONS (IT, 1999)

IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVFAC

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Aug 23, 2007
FILE: CPen_IR_Site_1A 070823

FIGURE: 3

6,242,500

2,060,500

2,060,000

PIT 12
NO BURN ASH
13.6 at 1'

PIT 13
NO BURN ASH

PIT 11
BURN ASH
3' THICK
98.3 at 2'
9.14 at 3.5'

PIT 14
NO BURN ASH

PIT 15
3' THICK BLACK ORGANIC LAYER
27.1 at 3'

PIT 10
BURN ASH
1.5' THICK
5.00 at 1'
1.12 at 4'

PIT 17
BURN ASH
GREATER THAN 4' THICK/ INTO GROUNDWATER
(DRUMS/ HIGH MAGNETIC ANOMALY)

GMW-7

GMW-2

ESTIMATED EXTENT OF BURN ASH
BASED ON 2006 TEST PIT DATA

PIT 16
BLACK ORGANIC LAYER 1 ' THICK

PIT 19
BURN ASH
1' THICK
229 at 2.5'
1150 at 5'

PIT 1
BURN ASH
6' THICK
781 at 3'
2.11 at 7'

PIT 20
NO BURN ASH

PIT 2
NO BURN ASH

PIT 18
BURN ASH
5' THICK
(BATTERY)

PIT 8
BURN ASH
3' THICK

GMW-6
759 at 3'
25.8 at 6'

1450 at 2'
3.27 at 4'

PIT 9
NO BURN ASH

PIT 21
BURN ASH
5' THICK

4.82 at 6'

GMW-3

894 at 3'
270 at 6'

PIT 3
BURN ASH
2' THICK

GMW-8

PIT 4
NO BURN ASH

308 at 1.5'
14.4 at 4'

PIT 5
BURN ASH
3' THICK

PIT 7
BURN ASH
5' THICK

PIT 6
NO BURN ASH
8.10 at 6'

580 at 3'
1.31 at 6'

GMW-4
IA-2

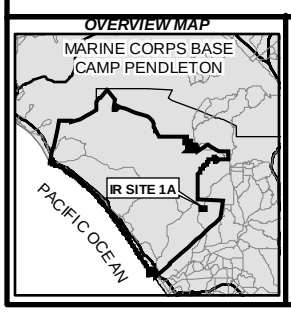
GMW-1
IA-1

CONCRETE DRAINAGE CHANNEL

A
A'
B
B'

LEGEND
SAMPLE LOCATION
LEAD (2006 TEST PIT SAMPLE, GDIT)
0.6 - 12.0 MG/KG
12.1 - 72.8 MG/KG (RG)
72.9 - 1000.0 MG/KG
1000.1 - 2550.0 MG/KG
MONITORING WELL /PIEZOMETER
EXCAVATION PERIMETER (1999)
ESTIMATED EXTENT OF REMAINING BURN ASH WASTE BASED ON 2006 TEST PIT DATA

OVERVIEW MAP



NOTES:
1) RESULTS ARE IN MILLIGRAMS PER KILOGRAM (MG/KG)
2) RG = REMEDIATION GOAL
3) RG FOR LEAD IS 72.8 MG/KG

N

0 40 80 160
FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

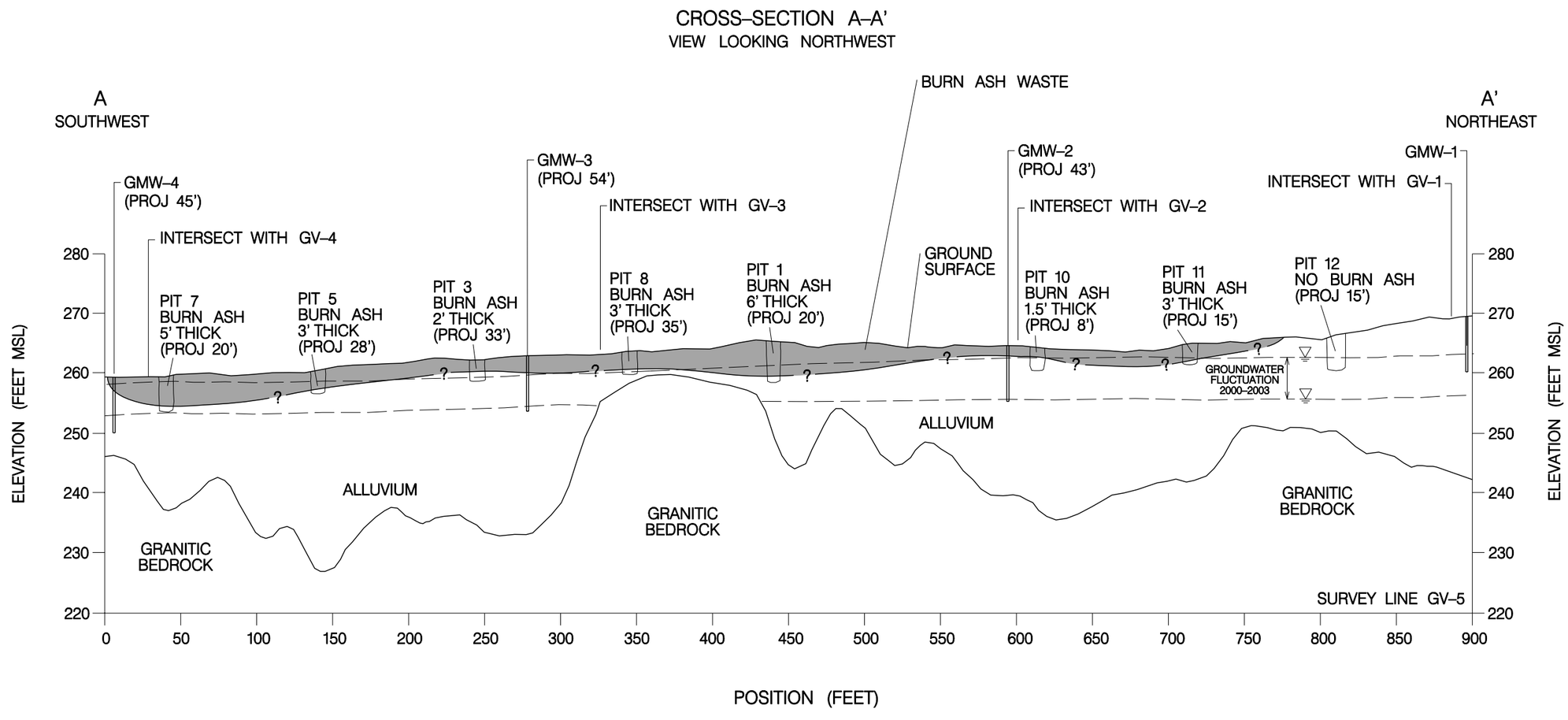
TEST PIT LOCATIONS AND ANALYTICAL RESULTS FOR LEAD (GDIT, DECEMBER 2006)

IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Aug 23, 2007
FILE: CPen_IR_Site_1A 070816_Geo1

FIGURE: 4



SOURCE: GEOPHYSICAL SURVEY BY GEOVISION, 2000

NOTES:
1. "GV–" INDICATES THE SURFACE PATHS OF THE GEOPHYSICAL INVESTIGATION.
2. "PROJ" INDICATES THAT THE FEATURE SHOWN IS PROJECTED TO THE PLANE OF THE CROSS–SECTION BY THE NOTED DISTANCE.

CROSS–SECTION A–A'

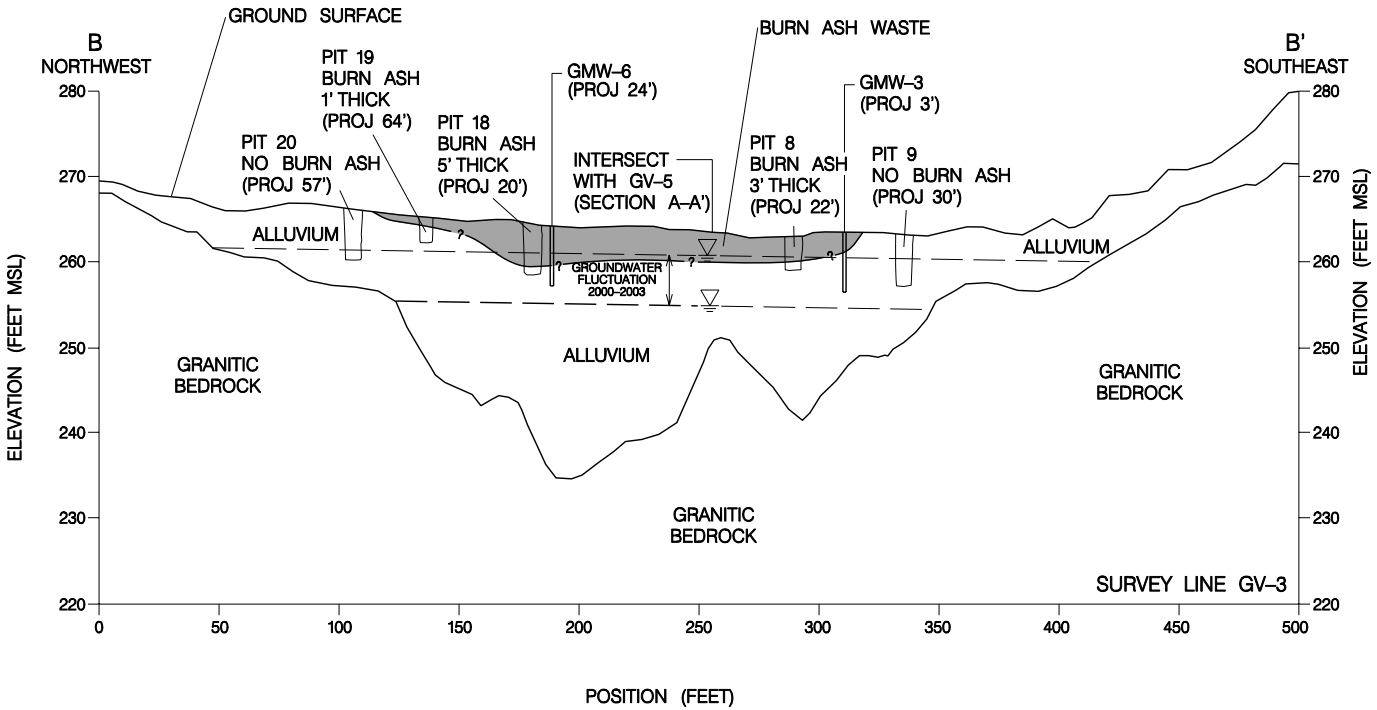
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

Date: 3/13/2008
File No. ahe069.dgn

FIGURE 5

CROSS–SECTION B–B'
VIEW LOOKING NORTHEAST



NOTES:
1. "GV–" INDICATES THE SURFACE PATHS OF THE GEOPHYSICAL INVESTIGATION.
2. "PROJ" INDICATES THAT THE FEATURE SHOWN IS PROJECTED TO THE PLANE OF THE CROSS–SECTION BY THE NOTED DISTANCE.

SOURCE: GEOPHYSICAL SURVEY BY GEOVISION, 2000

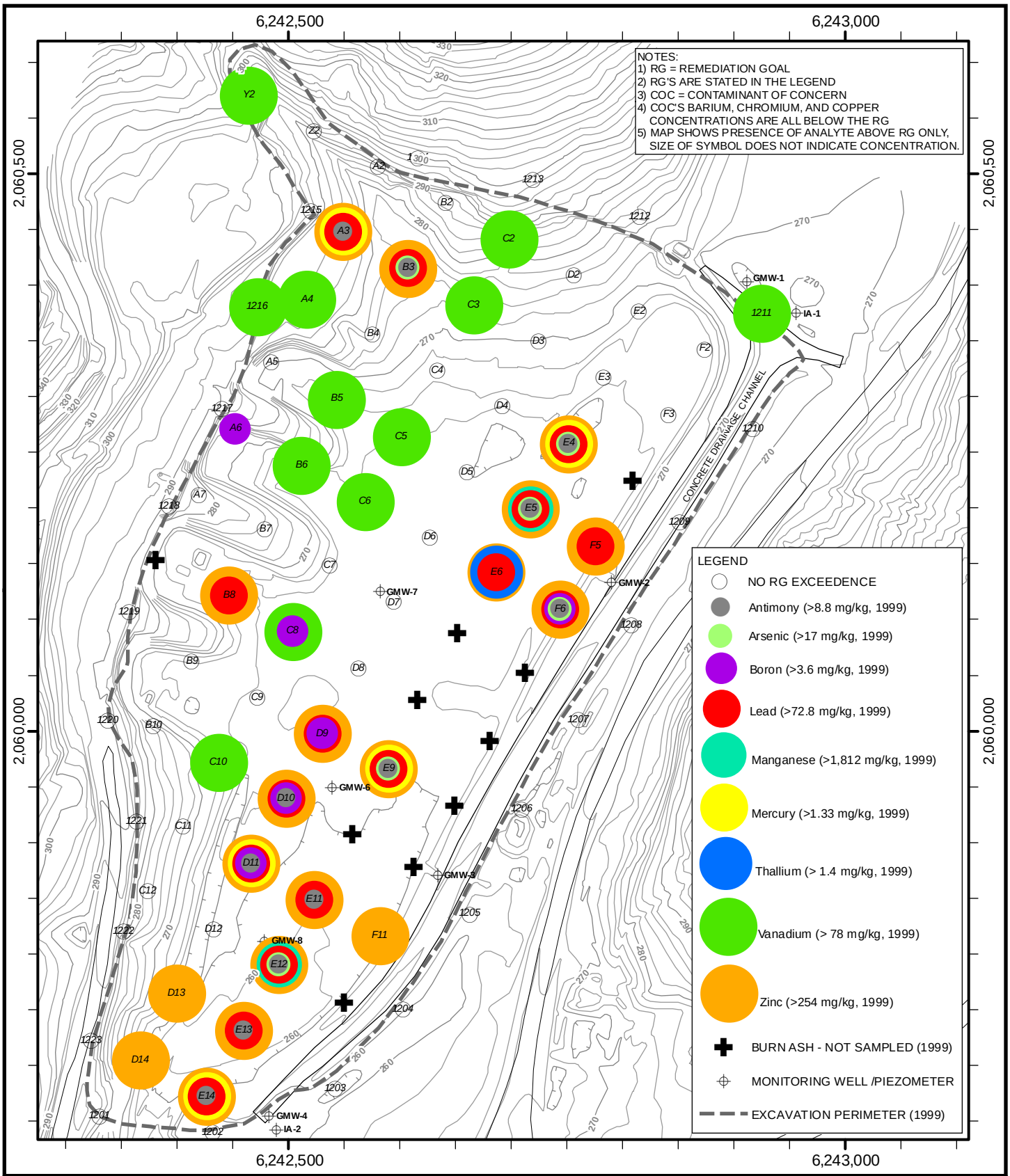
CROSS–SECTION B–B'

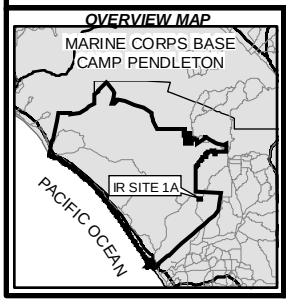
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

Date: 3/13/2008
File No. ahe068.dgn

FIGURE 6





N

0 60 120 240

FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

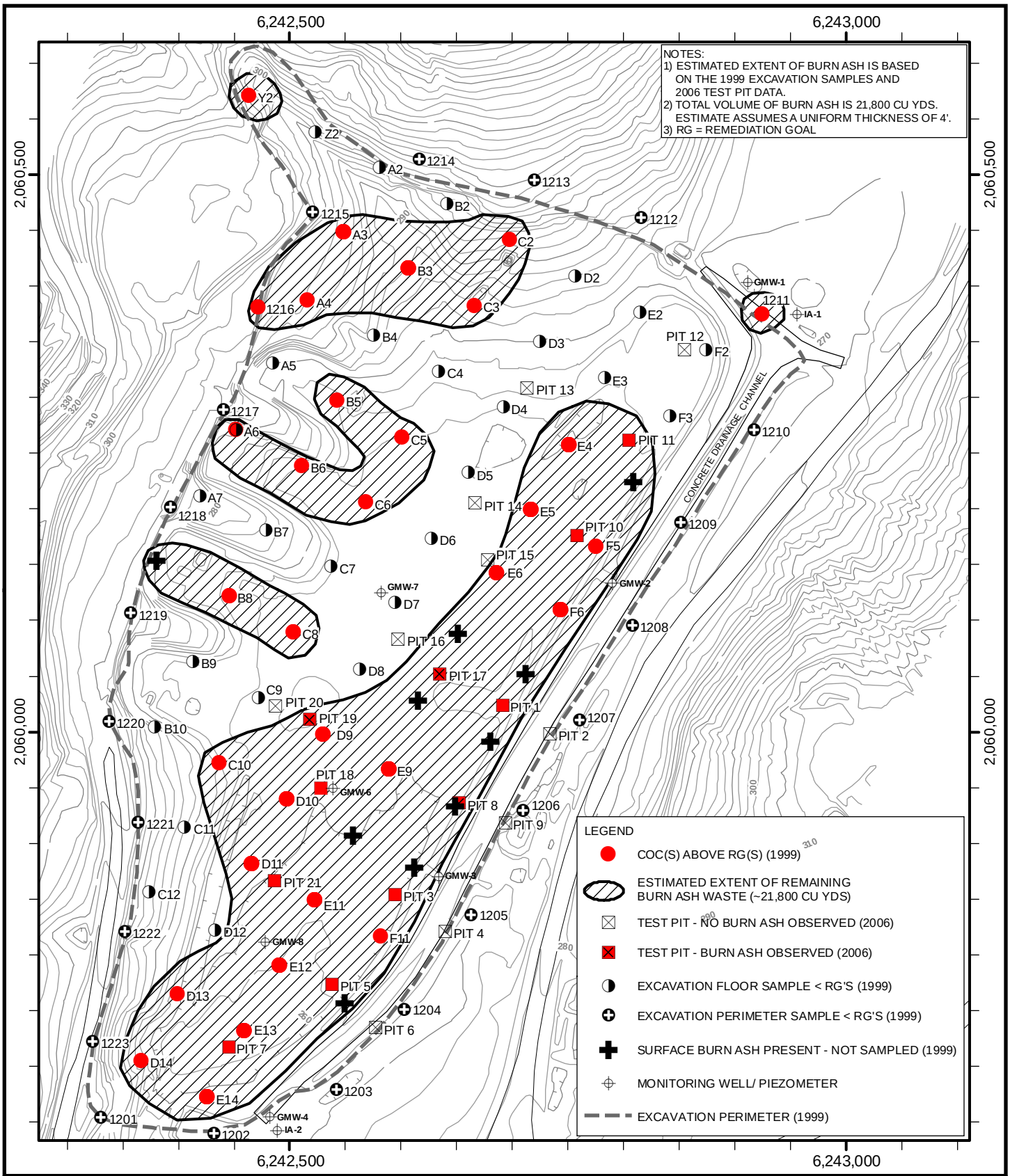
COCs IN SOIL EXCEEDING REVISED RGs, IN EXCAVATION PERIMETER SAMPLES AND FLOOR SAMPLES (IT, 1999)

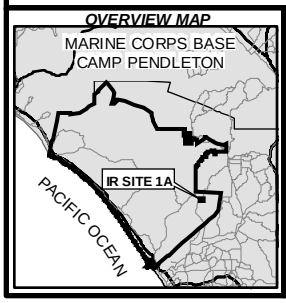
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Aug 23, 2007
FILE: CPen_IR_Site_1A 070718

FIGURE: 7





N

0 60 120 240

FEET

MAP PROJECTION: NAD 83 CALIFORNIA STATE PLANE 6, SURVEY FEET

ESTIMATED EXTENT OF REMAINING BURN ASH WASTE

IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

DATE: Aug 23, 2007
FILE: CPen_IR_Site_1A 070731

FIGURE: 8

TABLES

TABLE 1
IR PROGRAM ACTION CHRONOLOGY
IR SITE 1A, MCB CAMP PENDLETON, CALIFORNIA

Event	Date
Initial discovery of Site 1 (multiple refuse burning grounds outside Santa Margarita Basin) and process	1984 Initial Assessment Study
NPL Listing of MCB Camp Pendleton	15-Nov-89
FFA singed and established	24-Oct-90
Remedial Investigation Report (Group D Sites)	26-Jun-97
Feasibility Study Report (OU-3 Sites)	1-May-98
OU-3 ROD published *	11-Jan-99 *
Remedial Design and Work Plan (OU-3 Sites)	17-May-99
Field construction mobilized (OU-3 Sites)	Jul-99
Remedial excavation at Site 1A started	10-Aug-99
Remedial excavation stopped at Site 1A due to presence of groundwater	3-Nov-99
52nd FFA meeting approving excavation to be resumed after rainy seasons of 1999/2000	8-Nov-99
Eight piezometer installed and weekly groundwater level monitoring started	8-Nov-99
Site 1A winterization completed (runoff protection berm and sheetpile dam added)	15-Feb-00
Decision to discontinue CAMU disposal	Apr-00
Site 1A groundwater monitoring wells installed	11-Jul-00
1st round groundwater sampling and analysis	13-Jul-00
2nd round groundwater sampling and analysis (VOCs only)	3-Aug-00
3rd round groundwater sampling and analysis	21-Aug-00
Initial groundwater monitoring data presented in 60th FFA meeting	12-Sep-00
Initial groundwater monitoring report	25-Sep-00
Interim Site 1A remedial action report	14-Nov-00
Addendum to interim report	23-Jan-01
4th round groundwater sampling and analysis	21-Mar-01
5th round groundwater sampling and analysis	29-Aug-01
Annual groundwater monitoring report	2-Nov-01
6th round groundwater sampling and analysis	23-25 July 2002
7th round groundwater sampling and analysis	22, 24 October 2002
Groundwater Monitoring Report	Jun-03
8th round groundwater sampling and analysis	Mar-03
Interim round groundwater sampling and analysis (VOCs only)	May-03
9th round groundwater sampling and analysis	Jun-03
Trench sampling conducted to assess the extent of remaining burn ash	Dec-06
FFA meeting approving revised Remediation Goals.	24-May-07

Notes:

CAMU = Corrective Action Management Unit
FFA = Federal Facilities Agreement
IR = Installation Restoration
MCB = Marine Corps Base
NPL = National Priority List
OU = Operable Unit
ROD = Record of Decision;
VOCs = Volatile Organic Compounds

* The ROD was signed by the Navy on 10 February 1999, then by other FFA members on various dates in March 1999.

TABLE 2
TRENCH SOIL SAMPLING ANALYTICAL RESULTS
IR SITE 1A
MCB CAMP PENDLETON, CALIFORNIA

TEST PIT #	TEST PIT TOTAL DEPTH (feet bgs)	BURN ASH THICKNESS (feet)	SAMPLE ID	SAMPLE DEPTH	SAMPLE DATE	LEAD EPA 6020A (mg/kg)
1	7.0	6.0	IR1A-P01-S01	3.0	12/21/2006	**781**
			IR1A-P01-S02	7.0	12/21/2006	2.11
2	6.0	NA	NA	NA	NA	NA
3	3.5	2.0	NA	NA	NA	NA
4	6.0	NA	NA	NA	NA	NA
5	4.0	3.0	IR1A-P05-S01	1.5	12/21/2006	**308**
			IR1A-P05-S02	4.0	12/21/2006	14.4
6	6.0	NA	IR1A-P06-S01	6.0	12/21/2006	8.10
7	6.0	5.0	IR1A-P07-S01	3.0	12/21/2006	**580**
			IR1A-P07-S02	6.0	12/21/2006	1.31
8	4.0	3.0	IR1A-P08-S01	2.0	12/21/2006	**1450**
			IR1A-P08-S02	4.0	12/21/2006	3.27
9	6.0	NA	IR1A-P09-S01	6.0	12/21/2006	4.82
10	4.0	1.5	IR1A-P10-S01	1.0	12/21/2006	5.00
			IR1A-P10-S02	4.0	12/21/2006	1.12
11	3.5	3.0	IR1A-P11-S01	2.0	12/21/2006	**983**
			IR1A-P11-S02	3.5	12/21/2006	9.14
12	6.0	NA	IR1A-P12-S01	1.0	12/21/2006	13.6
13	6.0	NA	NA	NA	NA	NA
14	6.0	NA	NA	NA	NA	NA
15	6.0	3.0*	IR1A-P15-S01	2.0	12/21/2006	27.1
16	6.0	1.0*	NA	NA	NA	NA
17	5.0	4.0**	IR1A-P17-S01	2.5	12/21/2006	**229**
			IR1A-P17-S02	5.0	12/21/2006	**1150**
18	6.0	5.0	IR1A-P18-S01	3.0	12/21/2006	**759**
			IR1A-P18-S02	6.0	12/21/2006	25.8
19	3.0	1.0	NA	NA	NA	NA
20	6.0	NA	NA	NA	NA	NA
21	6.0	5.0	IR1A-P21-S01	3.0	12/21/2006	**894**
			IR1A-P21-S02	6.0	12/21/2006	**270**

Notes:

Bold values indicate the analytical result exceeds the revised remediation goal (RG) for lead (72.8 mg/kg).

*Organic material, not believed to be burn ash related.

**Extent of burn ash could not be determined due to drums in excavation.

bgs = below ground surface

mg/kg = milligram per kilogram

NA = not analyzed

TABLE 3
REVISED REMEDIATION GOALS
IR SITE 1A, MCB CAMP PENDLETON, CALIFORNIA

Contaminant of Concern	Maximum Concentration	SLR Background Concentration [a] 0 to 5 feet	Residential PRG [b]	Ecological PLE [c]	RG 0 to 5 feet	RG 5 to 10 feet	HHRA Preliminary Remediation Goal [d]		ERA Preliminary Remediation Goals [e]	Revised Remediation Goal
							California Modified Toxicity Data	USEPA Toxicity Data		
Inorganics (mg/kg)										
Antimony	59.8	8.8	31	0.3	8.8	--	31.3	31.3	5.8	**8.8**
Arsenic	31.2	17	22 (nc)/0.38 (c)	0.3	17	22	0.06	0.39	680	**17**
Barium	1,420	133	5,300	65	133	--	5,417	5,417	2,206	**2,206**
Boron	14	--	5,900	3.6	3.6	--	--	--	--	**3.6**
Chromium (Total)	70.6	16	77,000 (nc)/9 (c)	1.5	16	--	1,429	1,429	298	**298**
Copper	2,030	6.5	2,800	12	12	2,800	3,129	3,129	5,360	**3,129**
Iron	123,000	20,200	--	32	20,200	--	NA [g]	NA [g]	NA [g]	NA [g]
Lead	2,550	12	150 (Cal-EPA)/ 400 (Reg. 9)	12	12	130	--	--	72.8	**72.8**
Manganese	6,730	199	1,800	109	199	--	10,406	1,812	2,945	**1,812**
Mercury	5	0.05	23	0.2	0.2	--	23.5	23.5	1.33	**1.33**
Thallium	3.6	1.4	5.2	0.4	1.4	5.4	6.3	6.3	1.38	**1.4**
Vanadium	154	40	550	4.9	40	--	78	78	2,827	**78**
Zinc	3,330	56	23,000	14	56	--	23,464	23,464	254	**254**
Dioxins/Furans (ng/kg)										
2,3,7,8-TCDD TEQ	--	--	3.9	--	--	--	4.5	3.9	44	**3.9**

Notes:

shading indicates source of revised RG

a = San Luis Rey Basin Background (SWDIV, 1997)

b = Region 9 Residential PRG (nc = noncancer, c = cancer) (IT, 1998)

c = Ecological PLE (IT, 1998)

d = The HHRA Preliminary RG with the lowest concentration was selected from among the combined receptor Preliminary RGs (as derived in OU 5 FS) as the final RG for each COC for unrestricted land use (Appendix B).

e = The value selected, as a site- and chemical-specific Ecological Preliminary RG, is the lowest of the Ecological Preliminary RGs for any wildlife receptor, derived using an effect-based TRV (Appendix B)

f = Revised remediation goal was set at background

g = Iron was not identified as a chemical of concern since it is classified as an essential nutrient and measured concentrations were below levels considered potentially toxic for human and ecological receptors.

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

NA = Not Applicable

TEQ = toxicity equivalency quotient

TABLE 4
SUMMARY OF EXCAVATION PERIMETER AND FLOOR CONFIRMATION SAMPLING RESULTS (1999)
IR SITE 1A, MCB CAMP PENDLEOTN, CALIFONRIA

		Analyte	Antimony	Arsenic	Barium	Boron	Chromium	Copper	Iron	Lead	Manganese	Mercury	Thallium	Vanadium	Zinc
		Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample Location	Sample Depth (ft bgs)	Date													
A2	1.5	10/27/1999	0.27 U	2.7	79.5	2 J	6.1	8.2	23500	1.7	245	0.073 J	0.35 U	66.1	31.9
A3	4.9	9/17/1999	**9.7**	5.2	155	0.8	38	191	30800	**403**	306	**5**	0.91 U	70.6	**582**
A4	5.7	9/17/1999	0.29 U	4.4	111	1.4	11.1	14.4	36400	1.8	332	0.037 J	0.38 U	**119**	31
A5	18.5	10/14/1999	0.57 U	1.2 U	71.7	1.8	19.7	18.5	24500	17.8	325	0.2 U	0.34 U	61.6	77.4
A6	13.4	10/14/1999	0.56 U	1.6	70.1	**5.31**	19.6	33.4	25800	54	505	0.093 B	0.34 U	62.1	161
A7	4.2	10/14/1999	0.57 U	1.2 U	113	2.1	10.1	30.1	27500	45.6	367	0.046 B	0.35 U	69.3	147
B2	4.5	9/17/1999	0.28 U	3.2	76.4	0.83	0.057 J	9.2	35100	0.99	254	0.027 U	0.36 U	69.2	55.5
B3	4.5	9/17/1999	**10.2**	**31.2**	630	0.92	67.8	249	104000	**1350**	940	0.27	0.89 U	49.8	**1080**
B4	7.3	11/10/1999	0.6 U	1.3 J	86.9	2.1 J	9	10.3	28700	8.9	253	0.031 J	0.37 U	74	29
B5	14.1	10/14/1999	0.58 U	2	86	1	4.7	21.2	28700	17.4	407	0.21 U	0.35 U	**103**	93.3
B6	13.8	10/14/1999	0.61 U	3	85.6	1	10.4	21.8	27000	0.85 B	566	0.22 U	0.37 U	**86.2**	46.7
B7	1.1	11/10/1999	0.57 U	0.31 U	81	1.8 U	5.7	16.6	24800	19.2	268	0.059 J	**3.5** U	58	71.9
B8	10	11/10/1999	0.57 U	3.3	103	2.2 J	10.1	1830	29100	135	429	0.09 J	**3.5** U	31.5	**509**
B9	11.7	11/10/1999	0.57 U	0.98 J	75.5	1.8 U	12	7.7	22800	1.9	325	0.021 J	**3.5** U	49.6	41.7
B10	7.2	11/10/1999	0.59 U	1.3 U	83.2	1.9 U	8	12.3	30300	5	350	0.023 J	**3.6** U	76.9	60.9
C2	4.7	11/10/1999	0.58 U	7.5	96.2	1.9 U	10.4	25.7	38900	2.6	417	0.018 J	0.35 U	**153**	52.3
C3	6.7	11/10/1999	0.58 U	2.8	63.6	1.9 U	1.5 J	16.7	31100	1.4	225	0.023 J	0.35 U	**130**	34.1
C4	9.8	10/14/1999	0.58 U	1.4	73.6	2.7	7.8	5.7	19700	1.9	300	0.21 U	0.35 U	53	25
C5	10.5	11/10/1999	0.59 U	1.7	98	1.9 U	8.3	13.9	32200	7.7	385	0.039 J	0.36 U	**84.8**	52.3
C6	9	11/10/1999	0.66 U	6.1	117	2.1 U	2.5	18.6	40700	1.3 J	264	0.017 J	0.4 U	**146**	48.8
C7	6.5	11/10/1999	0.59 U	2	59.7	1.9 U	2.8	3.4	20000	1.8	298	0.015 J	0.36 U	35.1	31.7
C8	7.1	11/10/1999	0.64 U	1.7	84.2	**6** J	20.2	10.5	46400	7.3	309	0.027 J	0.39 U	**154**	48.4
C9	6.9	11/10/1999	0.6 U	1.3 J	56.3	2.1 J	21.3	8.1	21700	2.6	287	0.015 J	0.37 U	63.8	26.4
C10	5.3	9/17/1999	0.66	3.4	80.7	1.1	21.6	8.9	29900	4.3	130	0.067 J	0.38 U	**98.8**	24.4
C11	3.8	9/17/1999	0.28 U	3.3	59.1	2.5	12.1	8.1	27000	2.7 U	202	0.024 J	0.37 U	76.8	27.6
C12	0.5	11/10/1999	0.61 U	1 J	39.5	2.3 J	11.2	6.7	24200	0.69 J	213	0.022 J	0.37 U	60.5	30.5
D2	5	11/10/1999	0.58 U	1 J	99.4	1.9 U	2 J	8.4	29700	1.4	409	0.036 J	0.35 U	42.6	45.2
D3	5	11/10/1999	0.58 U	0.39 J	60.2	1.9 U	6.5	8.2	18000	10.8	283	0.048 J	0.35 U	42.9	45.6
D4	14	11/10/1999	0.6 U	1.8	85.1	1.9 U	6.5	6.5	24500	3.1	490	0.019 J	0.37 U	56.2	30.7
D5	13.5	10/14/1999	0.63 U	1.3 B	55.2	1.6	4.6	4.6	15000	1.6	156	0.22 U	0.38 U	40.2	21.2
D6	10.3	11/10/1999	0.62 U	1.5	104	2 U	8	9.2	23600	3.6	393	0.024 J	0.37 U	53.7	30.7
D7	7.9	11/10/1999	0.60 U	2.8	78.5	1.9 U	6.8	8.2	16900	4.6	277	0.023 J	0.36 U	42.5	26.2
D8	7.6	11/10/1999	0.61 U	4.5	95.3	2.8 J	10.7	13.8	21100	12.5	296	0.15 J	0.37 U	44	47.8
D9	6.8	11/10/1999	4	16.3	683	**12.1**	70.6	935	120000	**1450**	1240	0.85	**1.50** U	65.1	**2600**
D10	7	11/10/1999	**59.8**	9.3	436	**14**	54.7	865	86400	**1570**	885	0.26	0.92 U	47.9	**1620**
D11	7	11/10/1999	**19.9**	7	419	**13.7**	40.8	343	69800	**1020**	639	**1.4**	0.95 U	55.1	**1010**
D12	3.6	10/13/1999	0.59 U	0.91 B	83.8	2	16.8	10.6	22900	1.7	337	0.21 U	0.36 U	73	33.7
D13	6.6	9/17/1999	0.28 U	3.3	160	1.6	14.6	8.7	26800	2.7	313	0.03 J	0.37 U	33	**795**
D14	5.3	9/17/1999	0.28 U	2.6	77.7	0.43	3.5	1.7	16000	1.5	279	0.027 U	0.36 U	31	**908**
E2	4.1	11/10/1999	0.61 U	2.6	107	2.9 J	8.6	16.5	28100	18.5	433	0.11 J	0.37 U	61.2	76.2
E3	11.2	11/10/1999	0.63 U	0.34 U	117	3.3 J	11.2	11.7	25400	6.4	393	0.036 J	0.38 U	59.8	41.5
E4	15	9/23/1999	**11.4**	**28.2**	564	0.74	38.7	1090	65200	**987**	772	1.6	0.10 U	25.7	**2250**
E5	16.3	10/14/1999	**52.4**	33	556	1.3	68.6	1620	98400	**2550**	**1850**	0.49	0.78 U	53.4	**3420**
E6	15.2	10/14/1999	7.9	9.8	154	2.7	23.9	169	63200	**505**	448	0.6	3.6	57.5	**653**
E9	11.6	9/23/1999	**10.9**	**23.9**	519	0.55	40	872	107000	**918**	473	**18.8**	0.10 U	35.8	**2690**
E11	9.4	10/13/1999	**11.8**	10.1	245	0.95	30.3	617	72400	**431**	1680	0.48	0.48 U	44.7	**2110**
E12	7.6	10/14/1999	**21.3**	**24.2**	318	1.2	46	2030	64300	**1500**	**6730**	0.39	0.49 U	38.5	**6070**
E13	5.5	10/13/1999	**26.8**	2.6	1420	1.4	35.1	579	34000	**329**	1100	0.47	0.53 U	45.2	**2800**
E14	5.3	9/17/1999	**17**	6.3	269	2.3	34.6	938	43200	**471**	918	**1.5**	0.52 U	69.2	**3330**
F2	3.9	11/10/1999	0.63 U	1.7	107	2.6 J	12	16.3	20000	13.6	418	0.077 J	0.38 U	51.6	49.1
F3	7.2	11/10/1999	0.62 U	0.83 J	100	2.9 J	12.8	10.3	19600	4.2	236	0.029 J	0.38 U	47.4	29.6
F5	13.2	10/14/1999	0.78 U	1.6 B	91.9	2.1	12.4	57.5	20900	**153**	248	0.032 B	0.47 U	43.5	**335**
F6	9.3	9/23/1999	**27.8**	**17.1**	362	**5.07**	66	1000	123000	**2110**	1260	0.7	0.096 U	40.8	**2300**
F11	9.2	9/23/1999	0.17 U	0.34 J	93	0.70	11.6	76.2	20400	6.5	231	0.03 U	0.1 U	45.8	**431**
Y2	1.5	10/27/1999	0.27 U	4	116	1.9 U	7.6	15.9	33300	1.9	409	0.098 J	0.36 U	**126**	35.3
Z2	1.5	10/27/1999	0.29 U	2.1	73	2 U	4.4	3.5	22900	1.5	239	0.058 J	0.38 U	38.1	31.9
1201	2.5	3/30/1999	0.250 U	1.20	56.20	1.60	15.40	5.20	16900	1.90	214.0	0.210 U	0.290 U	43.8	29.7
1202	2.5	4/1/1999	0.610 U	1.00 J	24.00	0.26 U	1.30 J	9.50	8000	3.00 J	110.0	0.260 U	0.720 U	13.4	77.1
1203-35	2.5	10/13/1999	0.670 U	0.87 B	23.30	0.89	7.30	15.70	16400	12.10	86.6	0.240 U	0.410 U	38.8	59.1
1204-35	2.5	9/2/1999	0.320 U	1.50 U	16.20	0.67	0.33 B	34.40	4500	5.20	44.5	0.240 U	0.410 U	9.3	225.0
1205-20	5.0	8/9/1999	0.600 U	1.80	81.80	0.55	13.50	14.30	18100	17.90	322.0	0.039 J	0.360 U	38.5	60.8
1206-30	5.0	8/19/1999	0.270 U	1.90	92.80	0.61	5.20	7.90	15200	5.80	292.0	0.026 U	0.350 U	28.4	39.9
1207-40	2.5	9/2/1999	0.290 U	0.68 B	75.00	2.80	2.70	2.80	14600	1.40	268.0	0.220 U	0.380 U	26.3	22.1
1208-30	1.5	8/6/1999	0.460 U	0.77 J	25.60	0.44	3.40	6.10	6800	7.00	66.5	0.073 U	0.420 U	16.7	29.5
1209-40	2.5	8/19/1999	0.290 U	1.40	89.50	1.10	11.20	9.00	16600	3.10	295.0	0.028 U	0.380 U	41.9	28.3
1210-55	1.5	9/2/1999	0.280 U	1.10 B	101.00	3.10	6.60	8.50	15800	2.00	315.0	0.220 U	0.370 U	33.0	28.1
1211-30	1.5	10/13/1999	0.770 U	4.00	168.00	1.20	17.40	25.30	30600	16.90	312.0	0.220 U	0.470 U	**81.3**	72.9
1212-10	1.0	10/13/1999	0.710 U	1.80	70.90	1.20	10.70	8.60	25100	17.80	360.0	0.200 U	0.430 U	50.1	64.4
1213-10	0.5	10/13/1999	0.570 U	1.40	34.80	0.67	1.60 B	2.40	22700	2.70	291.0	0.210 U	0.350 U	24.8	34.0
1214-10	1.0	10/13/1999	0.570 U	2.40	102.00	0.73	5.50	3.50	23800	3.00	241.0	0.210 U	0.350 U	60.0	35.3
1215	1.5	3/30/1999	0.260 U	2.30	82.00	1.70	7.70	8.40	20900	3.20	341.0	0.220 U	0.300 U	63.1	27.7
1216	0.5	3/30/1999	0.260 U	2.90	97.90	1.20	10.30	12.60	26000	1.80	316.0	0.220 U	0.310 U	**86.2**	31.4
1217	1.5	3/30/1999	0.250 U	0.54 J	28.00	1.20	3.60	0.78 J	13100	1.30	194.0	0.210 U	0.290 U	24.8	20.9
1218	1.5	3/30/1999	0.250 U	1.10 J	85.90	1.20	5.90	3.50	23400	0.65 J	276.0	0.210 U	0.290 U	60.2	39.2
1219	1.5	3/30/1999	0.270 U	1.40	35.60	1.00	6.40	2.50	22600	1.60	140.0	0.220 U	0.310 U	38.6	27.4
1220	2.5	3/30/1999	0.250 U	1.40	84.50	1.30	4.80	1.90 J	21600	0.78 J	268.0	0.210 U	0.290 U	55.2	38.3
1221	1.5	3/30/1999	0.260 U	1.80	94.60	0.73	10.50	6.90	20900	2.00	387.0	0.210 U	0.300 U	53.2	30.8
1222	1.5	3/30/1999	0.250 U	1.50	82.90	1.30	16.30	7.30	19300	30.00	313.0	0.210 U	0.290 U	52.8	39.7
1223	1.5	3/30/1999	0.250 U	1.50	80.50	0.40	7.40	6.20	19200	9.00	309.0	0.210 U	0.290 U	43.0	78.8

Revised RGs	8.8	17	2206	3.6	298	3129	NA	72.8	1812	1.33	1.4	78	254

Notes:

Bold - Value exceeds the revised Remediation Goal (RG).

U = not detected at or above the stated reporting limit or the method detection limit (if the cleanup standard is less than the reporting limit).

B = result between the reporting detection limit and method detection limit.

J = estimated value.

ft = feet

bgs = below ground surface

mg/kg = milligrams per kilogram.

NA = Not applicable

APPENDIX A

2006 Trench Sampling
Laboratory Analytical Report

TABLE OF CONTENTS

CLIENT: **GENERAL DYNAMICS IT**

PROJECT: **CPEN IR SITE 1A**

SDG: **06L280**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1005
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	METHOD 6020A	7000 – 7134
WET	**	8000 –
OTHERS		

** - Not Requested

EMAX
LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax:(310) 618-0818

Date: 01-03-2007
EMAX Batch No.: 06L280

Attn: Hamide Kayaci

General Dynamics IT
3430 Camino Del Rio North
San Diego, CA 92108

Subject: Laboratory Report
Project: CPEN IR Site 1A

Enclosed is the Laboratory report for samples received on 12/22/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
IR1A-P10-S01	L280-01	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P10-S02	L280-02	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P11-S01	L280-03	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P11-S02	L280-04	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P12-S01	L280-05	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P15-S01	L280-06	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P17-S01	L280-07	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P17-S02	L280-08	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P18-S01	L280-09	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P18-S02	L280-10	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P21-S01	L280-11	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P21-S02	L280-12	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P01-S01	L280-13	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P01-S02	L280-14	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P05-S01	L280-15	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P05-S02	L280-16	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P06-S01	L280-17	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P07-S01	L280-18	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P07-S02	L280-19	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P08-S01	L280-20	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P08-S02	L280-21	12/21/06	SOIL	LEAD BY ICP-MS
IR1A-P09-S01	L280-22	12/21/06	SOIL	LEAD BY ICP-MS

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.
Laboratory Director

EMAX LABORATORIES, INC.

SAMPLE RECEIPT FORM 1

Type of Delivery	Delivered By/Airbill		
☑ EMAX Courier	CEF COC	ECN	06L280
☐ Client Delivery		Recepient	A.R
☐ Third Party		Date	122206
		Time	1550

COC Inspection

☑ Client Name ☐ Client PM/FC ☑ Sampler Name ☑ Sampling Date/Time/Location ☑ Sample ID ☑ Matrix
☑ Address ☐ Tel # / Fax # ☑ Courier Signature ☑ Analysis Required ☐ Preservative (if any) ☐ TAT

Safety Issues

☐ None ☐ High concentrations expected ☐ Superfund Site samples ☐ Rad screening required

Comments:

Packaging Inspection

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☐ Custody Seal	☑ Intact	☐ Damaged		
Packaging	☑ Bubble Pack	☐ Styrofoam	☐ Popcorn	☑ Sufficient	☑ Plastic bag
Temperatures	☑ Cooler 1 26 °C	☐ Cooler 2 ____ °C	☐ Cooler 3 ____ °C	☐ Cooler 4 ____ °C	☑ Cooler 5 ____ °C
	☐ Cooler 6 ____ °C	☐ Cooler 7 ____ °C	☐ Cooler 8 ____ °C	☐ Cooler 9 ____ °C	☐ Cooler 10 ____ °C

Comments: ☐ **PM was informed on non-compliant coolers imediately.**

DISCREPANCIES

LSID	LSCID	Sample Label ID/COC ID	Discrepancy Code	Corrective Action Code
08			D3-TIME NEEDS on	Okay.
			VSBEL 11:47	
13			D3-TIME NEEDS ON	follow the label.
			VSBEL 13:15	per Client's request
				HL 12/26/06

REVIEWS

Sample Labeling ____ Date 12/22/06

SRF ____ Date 12/22/06

PM HL Date 12/22/06

LEGEND:

Code	Description- Sample Management	Code	Description-Sample Management	Code	Description-Project Management
A1	Analysis is not indicated in COC	E1	Preservative needed; sample has no preservative	R1	Hold sample(s); wait for further instructions
A2	Analysis is not indicated in label	E2	Preservative not needed but sample is preserved	R2	Proceed as indicated in COC
A3	Analysis is inconsistent in COC vis-à-vis label	F1	Not enough quantity of samples	R3	Refer to attached instruction
B1	Sample ID is not indicated in COC	F2	Bubble is> 6mm	R4	Cancel the analysis
B2	Sample ID is not indicated in label	G1	Temperature is out of range (4 +_ 2°C)	R5	
B3	Sample ID is inconsistent in COC vis-à-vis label	G2	Out of Holding Time	R6	
C1	Wrong container	G3	>20 % solid particle		
C2	Broken container	H1			
C3	Leaking container	H2			
D1	Date and/or time is not indicated in COC				
D2	Date and/or time is not indicated in label				
D3	Date and/or time is inconsistent in COC vis-à-vis label				

CHAIN OF CUSTODY

EMAX LABORATORIES, INC.
1835 W. 205th Street, Torrance, CA 90501
Tel #: 310-618-8889 Fax #: 310-618-0818
Email: info@emaxlabs.com

PO NUMBER:

SAMPLE STORAGE

EMAX CONTROL NO. * 06L280

PROJECT CODE:

CLIENT GENERAL DYNAMICS
PROJECT CPEN IR 1A
COORDINATOR Sue Booth sbooth@spawar.navy.mil
TEL 619-571-4029 FAX EMAIL
SEND REPORT TO Sue Booth see Instr.
COMPANY General Dynamics IT
ADDRESS 3430 Camino Del Rio North
San Diego, Ca 92108
EMAX PM

MATRIX CODE	PRESERVATIVE CODE
DW=Drinking Water	IC = Ice
GW=Ground Water	HC = HCl
WW=Waste Water	HN=HNO3
SD=Solid Waste SL=Sludge	SH=NaOH
SS=Soil/ Sediment	ST=Na2S2O3
WP=Wipes PP=Pure Products	ZA=Zinc Acetate
AR=Air	HS=H_2SO_4
O=	

ANALYSIS REQUIRED: LEAD EPA 6020

TAT:
- ☐ Rush ____hrs.
- ☐ Rush ____days
- ☐ 7 days
- ☐ 14 days
- ☐ 21 days
- ☐ 30 days
- ☒ 5 days
- ☐

LAB	SAMPLE ID CLIENT	SAMPLING LOCATION	DATE	TIME	CONTAINER NO.	SIZE	TYPE	MATRIX CODE	QC	PRESERVATIVE CODE	COMMENTS
1	IR1A-P10-S01	IR1A	12/21/06	10:27	1	20z	GLASS JAR	SS		IC	
2	IR1A-P10-S02			10:27							
3	IR1A-P11-S01			10:40							
4	IR1A-P11-S02			10:50							
5	IR1A-P12-S01			10:59							
6	IR1A-P15-S01			11:25							
7	IR1A-P17-S01			11:40							
8	IR1A-P17-S02			11:48							
9	IR1A-P18-S01			12:[illegible]							
10	IR1A-P18-S02			12:[illegible]							
11	IR1A-P21-S01			12:49							
12	IR1A-P21-S02	IR1A	12/21/06	12:52	1	20z	GLASS JAR	SS		IC	

Instructions
Please send results electronically to email

Cooler #	Temp. (°C)	Sample #s
1	2.6	

SAMPLER

COURIER/AIRBILL

RELINQUISHED BY	Date	Time	RECEIVED BY
Jim Pierce James R Pierce	12/22/06	11:12	
	12/22/06	15:50	
	122206	1550	

NOTICE: Turn-around-time (TAT) for samples shall not begin untill all discrepancies have been resolved. For samples received and discrepancies resolved after 1500 hrs, TAT shall start at 0800 hrs the next business day. The client is responsible for all cost associted with sample disposal. Samples shall be disposed of as soon as practical (but not prior to fifteen (15) calendar days) after issuance of analytical report unless a different sample disposal schedule is pre-arranged with EMAX. Disposal fee for samples defined by CA Title 22 as non-hazardous shall be $5.00 per sample. EMAX will return hazardous samples to the client at the client's expense unless directed in writing otherwise.

CHAIN OF CUSTODY

EMAX LABORATORIES, INC.
1835 W. 205th Street, Torrance, CA 90501
Tel #: 310-618-8889 Fax #: 310-618-0818
Email: info@emaxlabs.com

PO NUMBER:

SAMPLE STORAGE

EMAX CONTROL NO. * 06L280

PROJECT CODE:

CLIENT GENERAL DYNAMICS
PROJECT CPEN IR 1A
COORDINATOR Sue Booth sbooth@spawar.navy.mil
TEL 619-571-4029 FAX EMAIL
SEND REPORT TO Sue Booth see insta
COMPANY General Dynamics IT
ADDRESS 3430 Camino Del Rio North
San Diego, Ca 92108
EMAX PM

MATRIX CODE	PRESERVATIVE CODE
DW=Drinking Water	IC = Ice
GW=Ground Water	HC = HCl
WW=Waste Water	HN=HNO3
SD=Solid Waste SL=Sludge	SH=NaOH
SS=Soil/ Sediment	ST=Na2S2O3
WP=Wipes PP=Pure Products	ZA=Zinc Acetate
AR=Air	HS=H_2SO_4
O=	

ANALYSIS REQUIRED: LEAD EPA 6020

TAT:
- ☐ Rush ____hrs.
- ☐ Rush ____days
- ☐ 7 days
- ☐ 14 days
- ☐ 21 days
- ☐ 30 days
- ☒ 5 days
- ☐

SAMPLE ID LAB	SAMPLE ID CLIENT	SAMPLING LOCATION	SAMPLING DATE	SAMPLING TIME	CONTAINER NO.	CONTAINER SIZE	CONTAINER TYPE	MATRIX CODE	QC	PRESERVATIVE CODE	COMMENTS
13	IR1A-Pϕ1-Sϕ1	IR1A	12/21/06	13:18	1	2oz	GLASS JAR	SS		IC	
14	IR1A-Pϕ1-Sϕ2	IR1A	12/21/06	13:17	1	↑	↑	↑		↑	
15	IR1A-Pϕ5-Sϕ1	IR1A	12/21/06	13:05	1						
16	IR1A-Pϕ5-Sϕ2	IR1A	12/21/06	13:03	1						
17	IR1A-Pϕ6-Sϕ1	IR1A	12/21/06	13:20	1						
18	IR1A-Pϕ7-Sϕ1	IR1A	12/21/06	13:01	1						
19	IR1A-Pϕ7-Sϕ2	IR1A	12/21/06	12:59	1						
20	IR1A-Pϕ8-Sϕ1	IR1A	12/21/06	10:12	1						
21	IR1A-Pϕ8-Sϕ2	IR1A	12/21/06	10:09	1	↓	↓	↓		↓	
22	IR1A-Pϕ9-Sϕ1	IR1A	12/21/06	10:18	1	2oz	GLASS JAR	SS		IC	

Instructions: Please send results electronically to email

Cooler #	Temp. (°C)	Sample #s
1	2.6	

SAMPLER

RELINQUISHED BY	Date	Time	RECEIVED BY
Jim Pierce James E Pierce	12/22/06	11:12	
	12/22/06	15:50	
	12/22/06	1550	

COURIER/AIRBILL

NOTICE: Turn-around-time (TAT) for samples shall not begin untill all discrepancies have been resolved. For samples received and discrepancies resolved after 1500 hrs, TAT shall start at 0800 hrs the next business day. The client is responsible for all cost associted with sample disposal. Samples shall be disposed of as soon as practical (but not prior to fifteen (15) calendar days) after issuance of analytical report unless a different sample disposal schedule is pre-arranged with EMAX. Disposal fee for samples defined by CA Title 22 as non-hazardous shall be $5.00 per sample. EMAX will return hazardous samples to the client at the client's expense unless directed in writing otherwise.

Hsin-Yi Lee

From: Kayaci, Hamide [Hamide.Kayaci@gdit.com]
Sent: Tuesday, December 26, 2006 2:36 PM
To: Hsin-Yi Lee
Subject: RE: Sample collection time (CPEN IR 1A)

Go for 13:15. Thanks

-----Original Message-----
From: Hsin-Yi Lee [mailto:HLee@emaxlabs.com]
Sent: Tuesday, December 26, 2006 2:36 PM
To: Kayaci, Hamide
Subject: Sample collection time (CPEN IR 1A)
Importance: High

Hamide,

Sample IR1A-P01-S01 sample collection time reads 13:15 on the label but COC marked 13:18. Which time should we use in the login.

Thanks

Hsin-Yi

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

GENERAL DYNAMICS IT

CPEN IR SITE 1A

METHOD 6020A
LEAD BY ICP-MS

SDG#: 06L280

CASE NARRATIVE

CLIENT: **GENERAL DYNAMICS IT**

PROJECT: **CPEN IR SITE 1A**

SDG: **06L280**

METHOD 6020A
METALS BY ICP-MS

Twenty-two (22) soil samples were received on 12/22/06 for Lead analysis by Method 6020A accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample L280-01 and L280-21 were analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

Sample L280-01 was spiked. All recoveries were within QC limit.

6. Sample Analysis

Sample was analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
LEAD BY ICP-MS

Client : GENERAL DYNAMICS IT
Project : CPEN IR SITE 1A

SDG NO. : 06L280
Instrument ID : T-198

SOIL

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1S	IML033SB	1	NA	12/28/0603:17	12/27/0609:35	98L30102	98L30100	IML033S	Method Blank
LCS1S	IML033SL	1	NA	12/28/0603:26	12/27/0609:35	98L30103	98L30100	IML033S	Lab Control Sample (LCS)
LCD1S	IML033SC	1	NA	12/28/0603:35	12/27/0609:35	98L30104	98L30100	IML033S	LCS Duplicate
IR1A-P10-S01AS	L280-01A	1	9.1	12/28/0603:43	12/27/0609:35	98L30105	98L30100	IML033S	Analytical Spike Sample
IR1A-P10-S01MS	L280-01M	1	9.1	12/28/0603:52	12/27/0609:35	98L30106	98L30100	IML033S	Matrix Spike Sample (MS)
IR1A-P10-S01MSD	L280-01S	1	9.1	12/28/0604:01	12/27/0609:35	98L30107	98L30100	IML033S	MS Duplicate (MSD)
IR1A-P10-S01	L280-01	1	9.1	12/28/0604:09	12/27/0609:35	98L30108	98L30100	IML033S	Field Sample
IR1A-P10-S01DL	L280-01J	5	9.1	12/28/0604:18	12/27/0609:35	98L30109	98L30100	IML033S	Diluted Sample
IR1A-P10-S02	L280-02	1	3.7	12/28/0604:26	12/27/0609:35	98L30110	98L30100	IML033S	Field Sample
IR1A-P11-S01	L280-03	1	10.6	12/28/0604:35	12/27/0609:35	98L30111	98L30100	IML033S	Field Sample
IR1A-P11-S02	L280-04	1	6.4	12/28/0605:01	12/27/0609:35	98L30114	98L30112	IML033S	Field Sample
IR1A-P12-S01	L280-05	1	7.4	12/28/0605:10	12/27/0609:35	98L30115	98L30112	IML033S	Field Sample
IR1A-P15-S01	L280-06	1	9.1	12/28/0605:18	12/27/0609:35	98L30116	98L30112	IML033S	Field Sample
IR1A-P17-S01	L280-07	1	5.6	12/28/0605:27	12/27/0609:35	98L30117	98L30112	IML033S	Field Sample
IR1A-P17-S02	L280-08	1	5.2	12/28/0605:36	12/27/0609:35	98L30118	98L30112	IML033S	Field Sample
IR1A-P18-S01	L280-09	1	12.9	12/28/0605:44	12/27/0609:35	98L30119	98L30112	IML033S	Field Sample
IR1A-P18-S02	L280-10	1	11.2	12/28/0605:53	12/27/0609:35	98L30120	98L30112	IML033S	Field Sample
IR1A-P21-S01	L280-11	1	8.4	12/28/0606:01	12/27/0609:35	98L30121	98L30112	IML033S	Field Sample
IR1A-P21-S02	L280-12	1	8.5	12/28/0606:10	12/27/0609:35	98L30122	98L30112	IML033S	Field Sample
IR1A-P01-S01	L280-13	1	12.6	12/28/0606:19	12/27/0609:35	98L30123	98L30112	IML033S	Field Sample
IR1A-P01-S02	L280-14	1	19.0	12/28/0606:45	12/27/0609:35	98L30126	98L30124	IML033S	Field Sample
IR1A-P05-S01	L280-15	1	10.5	12/28/0606:53	12/27/0609:35	98L30127	98L30124	IML033S	Field Sample
IR1A-P05-S02	L280-16	1	5.8	12/28/0607:02	12/27/0609:35	98L30128	98L30124	IML033S	Field Sample
IR1A-P06-S01	L280-17	1	4.4	12/28/0607:10	12/27/0609:35	98L30129	98L30124	IML033S	Field Sample
IR1A-P07-S01	L280-18	1	12.0	12/28/0607:19	12/27/0609:35	98L30130	98L30124	IML033S	Field Sample
IR1A-P07-S02	L280-19	1	6.1	12/28/0607:28	12/27/0609:35	98L30131	98L30124	IML033S	Field Sample
IR1A-P08-S01	L280-20	1	10.9	12/28/0607:37	12/27/0609:35	98L30132	98L30124	IML033S	Field Sample
IR1A-P08-S02AS	L280-21A	1	6.0	12/28/0607:45	12/27/0609:35	98L30133	98L30124	IML034S	Analytical Spike Sample
IR1A-P08-S02	L280-21	1	6.0	12/28/0607:54	12/27/0609:35	98L30134	98L30124	IML034S	Field Sample
IR1A-P08-S02DL	L280-21J	5	6.0	12/28/0608:02	12/27/0609:35	98L30135	98L30124	IML034S	Diluted Sample
MBLK2S	IML034SB	1	NA	12/28/0608:28	12/27/0609:35	98L30138	98L30136	IML034S	Method Blank
LCS2S	IML034SL	1	NA	12/28/0608:37	12/27/0609:35	98L30139	98L30136	IML034S	Lab Control Sample (LCS)
LCD2S	IML034SC	1	NA	12/28/0608:46	12/27/0609:35	98L30140	98L30136	IML034S	LCS Duplicate
IR1A-P09-S01	L280-22	1	4.8	12/28/0608:55	12/27/0609:35	98L30141	98L30136	IML034S	Field Sample

FN - Filename
% Moist - Percent Moisture

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P10-S01	Date Analyzed:	12/28/06 04:09
Lab Samp ID:	L280-01	Dilution Factor:	1
Lab File ID:	98L30108	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	9.1
Calib. Ref.:	98L30100	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	5.00	0.550	0.110

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P10-S02	Date Analyzed:	12/28/06 04:26
Lab Samp ID:	L280-02	Dilution Factor:	1
Lab File ID:	98L30110	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	3.7
Calib. Ref.:	98L30100	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	1.12	0.519	0.104

10

7884

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P11-S01	Date Analyzed:	12/28/06 04:35
Lab Samp ID:	L280-03	Dilution Factor:	1
Lab File ID:	98L30111	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	10.6
Calib. Ref.:	98L30100	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	983	0.559	0.112

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P11-S02	Date Analyzed:	12/28/06 05:01
Lab Samp ID:	L280-04	Dilution Factor:	1
Lab File ID:	98L30114	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	6.4
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	9.14	0.534	0.107

ω

7886

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P12-S01	Date Analyzed:	12/28/06 05:10
Lab Samp ID:	L280-05	Dilution Factor:	1
Lab File ID:	98L30115	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	7.4
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	13.6	0.540	0.108

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P15-S01	Date Analyzed:	12/28/06 05:18
Lab Samp ID:	L280-06	Dilution Factor:	1
Lab File ID:	98L30116	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	9.1
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	27.1	0.550	0.110

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P17-S01	Date Analyzed:	12/28/06 05:27
Lab Samp ID:	L280-07	Dilution Factor:	1
Lab File ID:	98L30117	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	5.6
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	229	0.530	0.106

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P17-S02	Date Analyzed:	12/28/06 05:36
Lab Samp ID:	L280-08	Dilution Factor:	1
Lab File ID:	98L30118	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	5.2
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	1150	0.527	0.105

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P18-S01	Date Analyzed:	12/28/06 05:44
Lab Samp ID:	L280-09	Dilution Factor:	1
Lab File ID:	98L30119	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	12.9
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	759	0.574	0.115

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P18-S02	Date Analyzed:	12/28/06 05:53
Lab Samp ID:	L280-10	Dilution Factor:	1
Lab File ID:	98L30120	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	11.2
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	25.8	0.563	0.113

4

7012

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P21-S01	Date Analyzed:	12/28/06 06:01
Lab Samp ID:	L280-11	Dilution Factor:	1
Lab File ID:	98L30121	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	8.4
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	894	0.546	0.109

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7613

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P21-S02	Date Analyzed:	12/28/06 06:10
Lab Samp ID:	L280-12	Dilution Factor:	1
Lab File ID:	98L30122	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	8.5
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	270	0.546	0.109

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7614

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P01-S01	Date Analyzed:	12/28/06 06:19
Lab Samp ID:	L280-13	Dilution Factor:	1
Lab File ID:	98L30123	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	12.6
Calib. Ref.:	98L30112	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	781	0.572	0.114

ler

7015

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P01-S02	Date Analyzed:	12/28/06 06:45
Lab Samp ID:	L280-14	Dilution Factor:	1
Lab File ID:	98L30126	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	19.0
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	2.11	0.617	0.123

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7616

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P05-S01	Date Analyzed:	12/28/06 06:53
Lab Samp ID:	L280-15	Dilution Factor:	1
Lab File ID:	98L30127	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	10.5
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	308	0.559	0.112

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7017

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P05-S02	Date Analyzed:	12/28/06 07:02
Lab Samp ID:	L280-16	Dilution Factor:	1
Lab File ID:	98L30128	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	5.8
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	14.4	0.531	0.106

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METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P06-S01	Date Analyzed:	12/28/06 07:10
Lab Samp ID:	L280-17	Dilution Factor:	1
Lab File ID:	98L30129	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	4.4
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	8.10	0.523	0.105

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METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P07-S01	Date Analyzed:	12/28/06 07:19
Lab Samp ID:	L280-18	Dilution Factor:	1
Lab File ID:	98L30130	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	12.0
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	580	0.568	0.114

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P07-S02	Date Analyzed:	12/28/06 07:28
Lab Samp ID:	L280-19	Dilution Factor:	1
Lab File ID:	98L30131	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	6.1
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	1.31	0.532	0.106

ul

7021

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P08-S01	Date Analyzed:	12/28/06 07:37
Lab Samp ID:	L280-20	Dilution Factor:	1
Lab File ID:	98L30132	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	10.9
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	1450	0.561	0.112

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METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P08-S02	Date Analyzed:	12/28/06 07:54
Lab Samp ID:	L280-21	Dilution Factor:	1
Lab File ID:	98L30134	Matrix :	SOIL
Ext Btch ID:	IML034S	% Moisture :	6.0
Calib. Ref.:	98L30124	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	3.27	0.532	0.106

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	12/21/06
Project	: CPEN IR SITE 1A	Date Received:	12/22/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	IR1A-P09-S01	Date Analyzed:	12/28/06 08:55
Lab Samp ID:	L280-22	Dilution Factor:	1
Lab File ID:	98L30141	Matrix :	SOIL
Ext Btch ID:	IML034S	% Moisture :	4.8
Calib. Ref.:	98L30136	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	4.82	0.525	0.105

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METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	NA
Project	: CPEN IR SITE 1A	Date Received:	12/27/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	MBLK1S	Date Analyzed:	12/28/06 03:17
Lab Samp ID:	IML033SB	Dilution Factor:	1
Lab File ID:	98L30102	Matrix :	SOIL
Ext Btch ID:	IML033S	% Moisture :	NA
Calib. Ref.:	98L30100	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	ND	0.500	0.100

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
SDG NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	MBLK1S				
CONTROL NO.:	IML033SB	IML033SL	IML033SC		
LAB FILE ID:	98L30102	98L30103	98L30104		
DATIME EXTRCTD:	12/27/0609:35	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	NA
DATIME ANALYZD:	12/28/0603:17	12/28/0603:26	12/28/0603:35	DATE RECEIVED:	12/27/06
PREP. BATCH:	IML033S	IML033S	IML033S		
CALIB. REF:	98L30100	98L30100	98L30100		

ACCESSION:

PARAMETER	BLNK RSLT mg/kg	SPIKE AMT mg/kg	BS RSLT mg/kg	BS % REC	SPIKE AMT mg/kg	BSD RSLT mg/kg	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Lead	ND	50.0	49.9	100	50.0	51.4	103	3	80-120	20

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
BATCH NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL		% MOISTURE:	9.1
DILUTION FACTOR:	1	5		
SAMPLE ID:	IR1A-P10-S01	IR1A-P10-S01DL		
EMAX SAMP ID:	L280-01	L280-01J		
LAB FILE ID:	98L30108	98L30109		
DATE EXTRACTED:	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	12/21/06
DATE ANALYZED:	12/28/0604:09	12/28/0604:18	DATE RECEIVED:	12/22/06
PREP. BATCH:	IML033S	IML033S		
CALIB. REF:	98L30100	98L30100		

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SERIAL DIL RSLT (mg/kg)	DIF RSLT %	QC LIMIT (%)
Lead	5.00	4.64	7	10

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
SDG NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL		% MOISTURE:	9.1
DILTN FACTR:	1	1		
SAMPLE ID:	IR1A-P10-S01			
CONTROL NO.:	L280-01	L280-01A		
LAB FILE ID:	98L30108	98L30105		
DATIME EXTRCTD:	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	12/21/06
DATIME ANALYZD:	12/28/0604:09	12/28/0603:43	DATE RECEIVED:	12/22/06
PREP. BATCH:	IML033S	IML033S		
CALIB. REF:	98L30100	98L30100		

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	AS RSLT (mg/kg)	AS % REC	QC LIMIT (%)
Lead	5.00	55.0	63.4	106	75-125

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
SDG NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL			% MOISTURE:	9.1
DILTN FACTR:	1	1	1		
SAMPLE ID:	IR1A-P10-S01				
CONTROL NO.:	L280-01	L280-01M	L280-01S		
LAB FILE ID:	98L30108	98L30106	98L30107		
DATIME EXTRCTD:	12/27/0609:35	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	12/21/06
DATIME ANALYZD:	12/28/0604:09	12/28/0603:52	12/28/0604:01	DATE RECEIVED:	12/22/06
PREP. BATCH:	IML033S	IML033S	IML033S		
CALIB. REF:	98L30100	98L30100	98L30100		

ACCESSION:

PARAMETER	SMPL RSLT mg/kg	SPIKE AMT mg/kg	MS RSLT mg/kg	MS % REC	SPIKE AMT mg/kg	MSD RSLT mg/kg	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Lead	5.00	55.0	55.8	92	55.0	55.5	92	1	75-125	20

METHOD 6020A
LEAD BY ICP-MS

Client	: GENERAL DYNAMICS IT	Date Collected:	NA
Project	: CPEN IR SITE 1A	Date Received:	12/27/06
SDG NO.	: 06L280	Date Extracted:	12/27/06 09:35
Sample ID:	MBLK2S	Date Analyzed:	12/28/06 08:28
Lab Samp ID:	IML034SB	Dilution Factor:	1
Lab File ID:	98L30138	Matrix :	SOIL
Ext Btch ID:	IML034S	% Moisture :	NA
Calib. Ref.:	98L30136	Instrument ID :	EMAXTI98

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Lead	ND	0.500	0.100

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
SDG NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	MBLK2S				
CONTROL NO.:	IML034SB	IML034SL	IML034SC		
LAB FILE ID:	98L30138	98L30139	98L30140		
DATIME EXTRCTD:	12/27/0609:35	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	NA
DATIME ANALYZD:	12/28/0608:28	12/28/0608:37	12/28/0608:46	DATE RECEIVED:	12/27/06
PREP. BATCH:	IML034S	IML034S	IML034S		
CALIB. REF:	98L30136	98L30136	98L30136		

ACCESSION:

PARAMETER	BLNK RSLT mg/kg	SPIKE AMT mg/kg	BS RSLT mg/kg	BS % REC	SPIKE AMT mg/kg	BSD RSLT mg/kg	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Lead	ND	50.0	50.0	100	50.0	50.9	102	2	80-120	20

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EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
BATCH NO.: 06L280
METHOD: METHOD 6020A

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MATRIX:	SOIL		% MOISTURE:	6.0
DILUTION FACTOR:	1	5		
SAMPLE ID:	IR1A-P08-S02	IR1A-P08-S02DL		
EMAX SAMP ID:	L280-21	L280-21J		
LAB FILE ID:	98L30134	98L30135		
DATE EXTRACTED:	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	12/21/06
DATE ANALYZED:	12/28/0607:54	12/28/0608:02	DATE RECEIVED:	12/22/06
PREP. BATCH:	IML034S	IML034S		
CALIB. REF:	98L30124	98L30124		

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SERIAL DIL RSLT (mg/kg)	DIF RSLT %	QC LIMIT (%)
Lead	3.27	3.16	3	10

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: GENERAL DYNAMICS IT
PROJECT: CPEN IR SITE 1A
SDG NO.: 06L280
METHOD: METHOD 6020A

MATRIX:	SOIL		% MOISTURE:	6.0
DILTN FACTR:	1	1		
SAMPLE ID:	IR1A-P08-S02			
CONTROL NO.:	L280-21	L280-21A		
LAB FILE ID:	98L30134	98L30133		
DATIME EXTRCTD:	12/27/0609:35	12/27/0609:35	DATE COLLECTED:	12/21/06
DATIME ANALYZD:	12/28/0607:54	12/28/0607:45	DATE RECEIVED:	12/22/06
PREP. BATCH:	IML034S	IML034S		
CALIB. REF:	98L30124	98L30124		

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	AS RSLT (mg/kg)	AS % REC	QC LIMIT (%)
Lead	3.27	53.2	58.9	105	75-125

DIGESTION LOG FOR ICP-MS METALS

SOP ☐ EMAX-3005 Rev. No.4 ☐ EMAX-3010 Rev. No. 3 ☑ EMAX-3050 Rev. No. 3 ☐ EMAX-CLP-TAL ☐ EMAX-200.8 Rev. 0 ☐ EMAX-6020 Rev. 2 ☐ Book # EIM-009

Matrix: SOIL Start Date: 12-27-06 Time: 9:35 Temp: 90°C Ending Date: 12-27-06 Time: 13:35 Temp.: 90°C

BATCH: IML034-S

Sample Prep ID	Lab Sample ID	Matrix Description: Color	Matrix Description: Texture / Clarity	Matrix Description: Artifacts	Sample Amount (g | ml)	pH	Extract Volume (ml)	Digestate Description: Color	Digestate Description: Clarity
01	IML034-SB				–	N/A	100		
02	-SL				–		100		
03	-SC				–		100		
04	L280-21				1.003		100		
05	-22				1.002		100		
06									
07									
08									
09									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									

12-27-06 MC

Standards	ID	Amount Added (ml)
LCS -1	SM6A-02-03	5.0
LCS -2	SM6A 02-04	5.0
LCS -3	N/A	
MS	N/A	

Reagent	Lot# / ID	Amount Added (ml)
HNO_3	SW1A-03-430	10.0
HCl	SW1A-03-406	10.0
H_2O_2	SW1A-03-404	10.0
HNO3 (1:1)	SM5B-02-58	10.0

Digestate Location	ICP
Extract Location	

Legend:

Texture	Cs = Coarse	Md = Medium	Fn = Fine
Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
Artifacts	Rk = rocks	Sl = Shale	Vg=Vegetation
Color	Bu = blue	Bk = Black	Br = Brown
	Gn = Green	Og = Orange	Rd = Red
	Yw = Yellow	Cl = Colorless	

Comments:

☑ Soil Samples - diluted 1-ml of digestate to 10-ml reagent water (DF=10X)

Prepared By: MC Standard Added By: MC

Witnessed By: MJM Extracts Rcvd. By: MJM

Checked By: MJM

Date Disposed: Disposed by:

EMAX LABORATORIES, INC. 1835 W. 205th St. Torrance, CA 90501

DIGESTION LOG FOR ICP-MS METALS

SOP ☐ EMAX-3005 Rev. No.4 ☐ EMAX-3010 Rev. No. 3 ☑ EMAX-3050 Rev. No. 3 ☐ EMAX-CLP-TAL ☐ EMAX-200.8 Rev. 0 ☐ EMAX-6020 Rev. 2 ☐ Book # EIM-009

Matrix: SOIL Start Date: 12-27-06 Time: ~~10:35~~ 9:35 mc 12/28/06 Temp: 90°C Ending Date: 12-27-06 Time: ~~14:~~ 13:35 Temp.: 90C

BATCH: IMLO33-S

Sample Prep ID	Lab Sample ID	Matrix Description Color	Texture / Clarity	Artifacts	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description Color	Clarity
01	IMLO33-SB				–	N/A	100		
02	-SL				–		100		
03	-SC				–		100		
04	L280-01				1.001		100		
05	-01M				1.002		100		
06	-01S				1.002		100		
07	-02				1.003		100		
08	-03				1.001		100		
09	-04				1.002		100		
10	-05				1.003		100		
11	-06				1.001		100		
12	-07				1.002		100		
13	-08				1.003		100		
14	-09				1.002		100		
15	-10				1.001		100		
16	-11				1.002		100		
17	-12				1.001		100		
18	-13				1.002		100		
19	-14				1.001		100		
20	-15				1.002		100		
21	-16				1.003		100		
22	-17				1.002		100		
23	-18				1.003		100		
24	-19				1.001		100		
25	-20				1.002		100		
26									
27									

12-27-06 mc

Standards	ID	Amount Added (ml)
LCS -1	SM6A-02-03	5.0
LCS -2	SM6A-02-04	5.0
LCS -3	N/A	
MS		

Reagent	Lot# / ID	Amount Added (ml)
HNO_3	SW1A-03-430	10.0
HCl	SW1A-03-406	10.0
H_2O_2	SW1A-03-404	10.0
HNO3 (1:1)	SM6B-02-58	10.0

Digestate Location	ICP
Extract Location	

Legend:

Texture	Cs = Coarse	Md = Medium	Fn = Fine
Clarity	Cr = Clear	Cy = Cloudy	Td = Turbid
Artifacts	Rk = rocks	Sl = Shale	Vg=Vegetation
Color	Bu = blue	Bk = Black	Bn = Brown
	Gn = Green	Og = Orange	Rd = Red
	Yw = Yellow	Cl = Colorless	

Comments:

☑ Soil Samples - diluted 1-ml of digestate to 10-ml reagent water (DF=10X)

Prepared By: MC Standard Added By: MC

Witnessed By: MSM Extracts Rcvd. By: MSM

Checked By: MSM

Date Disposed: Disposed by:

EMAX LABORATORIES, INC. 1835 W 205th St. Torrance, CA 90501

ICP-MS QC CHECK TABLE

QC	CCV HIGH	ICV	CCV	ICSAB	ICSA
Limit%	95-105	90-110	90-110	80-120	80-120
Comp	ug/L	ug/L	ug/L	ug/L	ug/L
Al	10000	6000	4500	100000	100000
Sb	100	60	45	20	0
As	100	60	45	20	0
Ba	100	60	45	20	0
Be	100	60	45	20	0
B	100	60	45	20	0
Cd	100	60	45	20	0
Ca	10000	6000	4500	100000	100000
Cr	100	60	45	20	0
Co	100	60	45	20	0
Cu	100	60	45	20	0
Fe	10000	60	4500	100000	100000
Pb	100	60	45	20	0
Mg	10000	6000	4500	100000	100000
Mn	100	60	45	20	0
Mo	100	60	45	2000	2000
Ni	100	60	45	20	0
Pt	100	60	45	20	0
K	10000	6000	4500	100000	100000
Se	100	60	45	20	0
Si	10000	6000	4500	2000	0
Ag	100	60	45	20	0
Na	10000	6000	4500	100000	100000
Sr	100	60	45	20	0
Tl	100	60	45	20	0
Sn	100	60	45	20	0
Ti	100	60	45	2000	2000
Th	100	60	45	20	0
W	100	60	45	20	0
V	100	60	45	20	0
U	100	60	45	20	0
Zn	100	60	45	20	0
Zr	100	60	45	20	0

ANALYSIS LOG
for
ICP-MS

Note: For samples, relevant QCs/Standards analyzed, refer to attached analytical sequence.

Start Date: 12/27/06 10:14 am

End Date: 12/28/06 09:46

Comments: 1st 12/28/06

Book #: A98-13

Instrument No.: 98

Analytical Batch: I98L30

Analytical Sequence: 98L30

Method File: EMAX 6020/200.8

SOP #	Rev. #
☐ EMAX-6020	2
☑ EMAX-200.8	0
☐ EMAX-	

STANDARDS ID	
S0	SM6B.02.43.03
S1	NA
S2	NA
S3	SM6B 02.43.04
S4	02.43.05
S5	02.43.06
S6	NA
S7	NA
ICV	SM6B.02.43.07
CCV	02.43.08
ICSA	02.44.01
ICSAB	02.43.09
6020 TUNE SOLN.	02.44.03
200.8 TUNE SOLN.	02.44.04
CRI/MRL	
MRL 1 (TV = 1/100)	SM6B 02.44.02

Analyzed By: [signature]

Date: 12/27/06

	Method	Type	Vial	Data File	Sample	Comment	Dil/Lvl	Fi	Sa	Dil	ISTD Conc	Action on Failure	Skip	LC	LC	Result
1		Keyword		TUNBEG	Start of TUNE											
2	C:\ICPCHEM\1\METHODS\TN6020.M	Tun6	1301	98L30001	6020tunchk		1.000									
3	C:\ICPCHEM\1\METHODS\TN200_8.M	Tun2	1302	98L30002	2008tunchk		1.000									
4		Keyword		TUNEND	End of TUNE											
5		Keyword		CALBEG	Start of CALIB											
6	C:\ICPCHEM\1\METHODS\EMAX6020.M	CalBlk	1101	98L30003	BLNK		Level 1									
7	C:\ICPCHEM\1\METHODS\EMAX6020.M	CalBlk	1102	98L30004	S0		Level 1									
8	C:\ICPCHEM\1\METHODS\EMAX6020.M	CalStd	1105	98L30005	S3 10		Level 4									
9	C:\ICPCHEM\1\METHODS\EMAX6020.M	CalStd	1106	98L30006	S4 50		Level 5									
10	C:\ICPCHEM\1\METHODS\EMAX6020.M	CalStd	1107	98L30007	S5 100		Level 6									
11	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICV1	1203	98L30008	ICV		1.000									
12	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICB	1101	98L30009	ICB		1.000									
13	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	1207	98L30010	MRL1		1.000									
14	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-A	1201	98L30011	ICSA		1.000									
15	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-AB	1202	98L30012	ICSAB		1.000									
16	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30013	BLANK		1.000									
17	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30014	BLANK		1.000									
18	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30015	CCV1		1.000									
19	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30016	CCB1		1.000									
20		Keyword		CALEND	End of CALIB											
21		Keyword		SMPLBEG	Start of SMPL											
22	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2304	98L30017	IML027WB		1.000									
23	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2305	98L30018	IML027WL		1.000									
24	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2306	98L30019	IML027WC		1.000									
25	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2307	98L30020	L053-01A		1.000									
26	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2308	98L30021	L053-01		1.000									
27	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2309	98L30022	L053-01J		5.000									
28	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2310	98L30023	L077-07		1.000									
29	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2311	98L30024	L812-01		1.000									
30	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2312	98L30025	L811-01		1.000									
31	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2401	98L30026	L811-02		1.000									
32	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30027	CCV2		1.000									
33	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30028	CCB2		1.000									
34	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2402	98L30029	IML025WB		1.000									
35	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2403	98L30030	IML025WL		1.000									
36	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2404	98L30031	IML025WC		1.000									
37	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2405	98L30032	L810-01A		1.000									
38	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2406	98L30033	L810-01		1.000									
39	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2407	98L30034	L810-01J		5.000									
40	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2408	98L30035	L810-02		1.000									
41	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2409	98L30036	L810-03		1.000									
42	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2410	98L30037	L810-04		1.000									
43	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2411	98L30038	L810-05		1.000									
44	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30039	CCV3		1.000									
45	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30040	CCB3		1.000									
46	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2412	98L30041	L810-06		1.000									

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	Method	Type	Vial	Data File	Sample	Comment	Dil/Lvl	Fi	Sa	Dil	ISTD Conc	Action on Failure	Skip	LC	LC	Result
47	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2501	98L30042	L810-07		1.000									
48	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2502	98L30043	L810-08		1.000									
49	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2503	98L30044	L810-09		1.000									
50	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2504	98L30045	L810-10		1.000									
51	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2505	98L30046	L810-11		1.000									
52	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2506	98L30047	L810-12		1.000									
53	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30048	BLANK		1.000									
54	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2507	98L30049	IML026SB		1.000									
55	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2508	98L30050	IML026SL		1.000									
56	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30051	CCV4		1.000									
57	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30052	CCB4		1.000									
58	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2509	98L30053	IML026SC		1.000									
59	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2510	98L30054	L077-01A		1.000									
60	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2511	98L30055	L077-01		1.000									
61	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	2512	98L30056	L077-01J		5.000									
62	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3101	98L30057	L077-02		1.000									
63	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3102	98L30058	L077-03		1.000									
64	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3103	98L30059	L077-04		1.000									
65	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3104	98L30060	L077-05		1.000									
66	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3105	98L30061	L077-06		1.000									
67	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3106	98L30062	L039-03		5.000									
68	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30063	CCV5		1.000									
69	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30064	CCB5		1.000									
70	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-A	1201	98L30065	ICSA2		1.000									
71	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-AB	1202	98L30066	ICSAB2		1.000									
72	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30067	BLANK		1.000									
73	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30068	BLANK		1.000									
74	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30069	CCV6		1.000									
75	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30070	CCB6		1.000									
76	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3107	98L30071	IML030WB		1.000									
77	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3108	98L30072	IML030WL		1.000									
78	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3109	98L30073	IML030WC		1.000									
79	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3110	98L30074	L162-01A		1.000									
80	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3111	98L30075	L162-01		1.000									
81	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3112	98L30076	L162-01J		5.000									
82	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3201	98L30077	L819-01		1.000									
83	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3202	98L30078	L819-02		1.000									
84	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3203	98L30079	L819-03		1.000									
85	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30080	CCV7		1.000									
86	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30081	CCB7		1.000									
87	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3204	98L30082	L819-04		1.000									
88	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3205	98L30083	L819-05		1.000									
89	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3206	98L30084	L819-06		1.000									
90	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3207	98L30085	L819-07		1.000									
91	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3208	98L30086	L819-08		1.000									
92	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3209	98L30087	L819-09		1.000									

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	Method	Type	Vial	Data File	Sample	Comment	Dil/Lvl	Fi	Sa	Dil	ISTD Conc	Action on Failure	Skip	LC	LC	Result
93	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3210	98L30088	L819-10		1.000									
94	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3211	98L30089	L819-11		1.000									
95	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3212	98L30090	L819-12		1.000									
96	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30091	CCV8		1.000									
97	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30092	CCB8		1.000									
98	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3301	98L30093	L821-01		1.000									
99	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3302	98L30094	L821-02		1.000									
100	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3303	98L30095	L821-03		1.000									
101	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3304	98L30096	L821-04		1.000									
102	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3305	98L30097	L823-01		1.000									
103	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3306	98L30098	L823-02		1.000									
104	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3307	98L30099	L823-03		1.000									
105	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1305	98L30100	CCV9		1.000									
106	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30101	CCB9		1.000									
107	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3308	98L30102	IML033SB		1.000									
108	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3309	98L30103	IML033SL		1.000									
109	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3310	98L30104	IML033SC		1.000									
110	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3311	98L30105	L280-01A		1.000									
111	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3312	98L30106	L280-01M		1.000									
112	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3401	98L30107	L280-01S		1.000									
113	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3402	98L30108	L280-01		1.000									
114	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3403	98L30109	L280-01J		5.000									
115	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3404	98L30110	L280-02		1.000									
116	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3405	98L30111	L280-03		1.000									
117	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1307	98L30112	CCV10		1.000									
118	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30113	CCB10		1.000									
119	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3406	98L30114	L280-04		1.000									
120	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3407	98L30115	L280-05		1.000									
121	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3408	98L30116	L280-06	OK FOR Pb	1.000									
122	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3409	98L30117	L280-07		1.000									
123	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3410	98L30118	L280-08		1.000									
124	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3411	98L30119	L280-09		1.000									
125	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3412	98L30120	L280-10		1.000									
126	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3501	98L30121	L280-11		1.000									
127	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3502	98L30122	L280-12		1.000									
128	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3503	98L30123	L280-13		1.000									
129	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1307	98L30124	CCV11		1.000									
130	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30125	CCB11		1.000									
131	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3504	98L30126	L280-14		1.000									
132	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3505	98L30127	L280-15		1.000									
133	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3506	98L30128	L280-16		1.000									
134	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3507	98L30129	L280-17		1.000									
135	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3508	98L30130	L280-18		1.000									
136	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3509	98L30131	L280-19		1.000									
137	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3510	98L30132	L280-20		1.000									
138	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3511	98L30133	L280-21A		1.000									

	Method	Type	Vial	Data File	Sample	Comment	Dil/Lvl	Fi	Sa	Dil	ISTD Conc	Action on Failure	Skip	LC	LC	Result
139	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	3512	98L30134	L280-21		1.000									
140	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	4101	98L30135	L280-21J		5.000									
141	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1307	98L30136	CCV12	OK	1.000									
142	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30137	CCB12	OK	1.000									
143	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	4102	98L30138	IML034SB		1.000									
144	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	4103	98L30139	IML034SL		1.000									
145	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	4104	98L30140	IML034SC		1.000									
146	C:\ICPCHEM\1\METHODS\EMAX6020.M	Sample	4105	98L30141	L280-22		1.000									
147	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-A	1201	98L30142	ICSA3		1.000									
148	C:\ICPCHEM\1\METHODS\EMAX6020.M	ICS-AB	1202	98L30143	ICSAB3		1.000									
149	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30144	BLANK		1.000									
150	C:\ICPCHEM\1\METHODS\EMAX6020.M	Blank	1101	98L30145	BLANK		1.000									
151	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCV	1307	98L30146	CCV13		1.000									
152	C:\ICPCHEM\1\METHODS\EMAX6020.M	CCB	1102	98L30147	CCB13		1.000									
153		Keyword		SMPLEND	End of SMPL											
154		Keyword		End	End of Sequence											
155		Keyword		CCVBEG	Start of CCV											
156		Keyword		CCVEND	End of CCV											
157		Keyword		BLKBEG	Start of BLANK											
158		Keyword		BLKEND	End of BLANK											
159		Keyword		ERRBEG	Start of ERRTERM											
160		Keyword		ERREND	End of ERRTERM											

Calibration - d:\DATA\I982006\L\I98L30.B\EMAX6020.C

Last Calib:	Dec 27, 2006 12:42 pm
Calibration Type:	External Calibration Method
Calibration Title:	
Weighting Method:	1/(SD*SD)
Mass Interpolation Fit for VIS:	Point to Point
Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Multi Tune:	#1 h2.u
	#2 he.u
	#3 norm.u

=== Standard Files ===

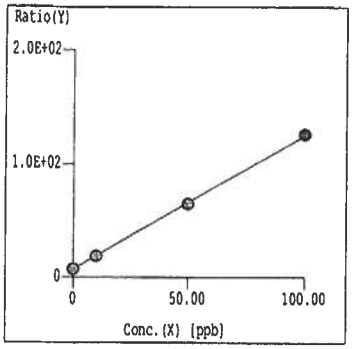
<Data Correction>

Bkg File:	---
Rejected Masses:	---
Interference Correction:	ON

	Data File	Sample Name	Date Acquired
1	d:\data\I982006\I\I98I30.b\98I30004.d\98I30004.d#	S0	Dec 27 2006 12:12 pm
2	---		
3	---		
4	d:\data\I982006\I\I98I30.b\98I30005.d\98I30005.d#	S3 10	Dec 27 2006 12:21 pm
5	d:\data\I982006\I\I98I30.b\98I30006.d\98I30006.d#	S4 50	Dec 27 2006 12:29 pm
6	d:\data\I982006\I\I98I30.b\98I30007.d\98I30007.d#	S5 100	Dec 27 2006 12:38 pm
7	---		
8	---		
9	---		
10	---		
11	---		
12	---		
13	---		
14	---		
15	---		
16	---		
17	---		
18	---		
19	---		
20	---		

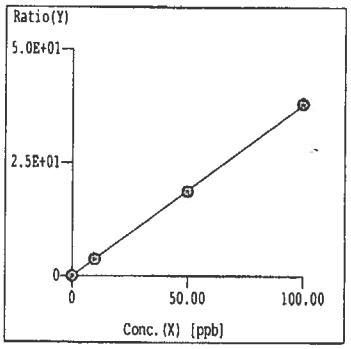
=== Graph Detail ===

Step Mass Element (3) 7 Li — ISTD 6 — Unit ppb



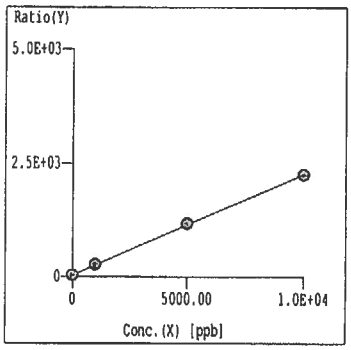
Curve Fit: Y=aX+[blank]
r = 0.9998
Y = 1.179E+000*X +6.986E+000
X = 8.478E-001*Y -5.923E+000
DL = 1.402E-01 ppb
BEC = 5.923 ppb

Step Mass Element (3) 9 Be — ISTD 6 — Unit ppb



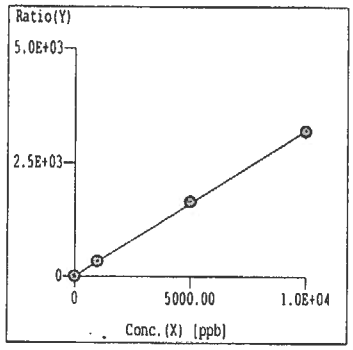
Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 3.782E-001*X +4.968E-003
X = 2.644E+000*Y -1.314E-002
DL = 1.681E-02 ppb
BEC = 1.314E-02 ppb

Step Mass Element (1) 23 Na — ISTD 45 — Unit ppb



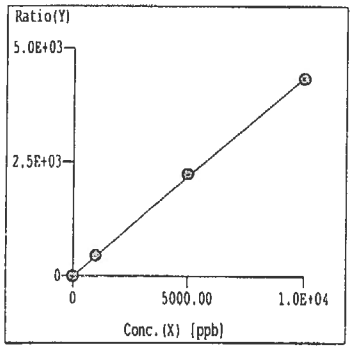
Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 2.225E-001*X +3.660E+001
X = 4.494E+000*Y -1.645E+002
DL = 8.274E-01 ppb
BEC = 164.5 ppb

Step Mass Element (3) 24 Mg — ISTD 45 — Unit ppb



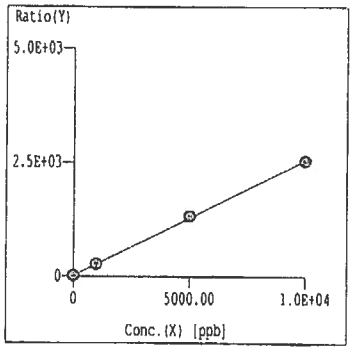
Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 3.212E-001*X +1.477E+000
X = 3.113E+000*Y -4.598E+000
DL = 3.786E-01 ppb
BEC = 4.598 ppb

Step Mass Element (3) 27 Al — ISTD 45 — Unit ppb



Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 4.353E-001*X +6.278E-001
X = 2.297E+000*Y -1.442E+000
DL = 5.909E-02 ppb
BEC = 1.442 ppb

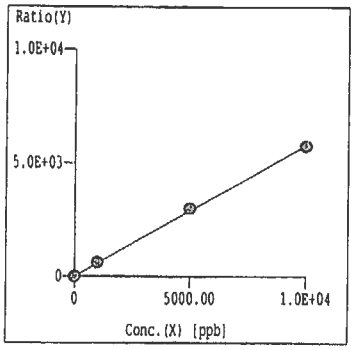
Step Mass Element (2) 39 K — ISTD 45 — Unit ppb



Curve Fit: Y=aX+[blank]
r = 0.9998
Y = 2.535E-001*X +1.744E+001
X = 3.945E+000*Y -6.881E+001
DL = 9.739E-01 ppb
BEC = 68.81 ppb

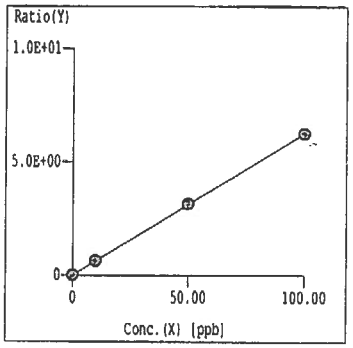
=== Graph Detail ===

Step Mass Element (1) 40 Ca — ISTD 45 — Unit ppb



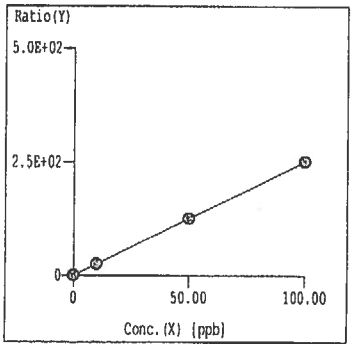
Curve Fit: Y=aX+[blank]
r = 0.9998
Y = 5.776E-001*X +4.796E+000
X = 1.731E+000*Y -8.303E+000
DL = 3.330E-01 ppb
BEC = 8.303 ppb

Step Mass Element (3) 47 Ti — ISTD 45 — Unit ppb



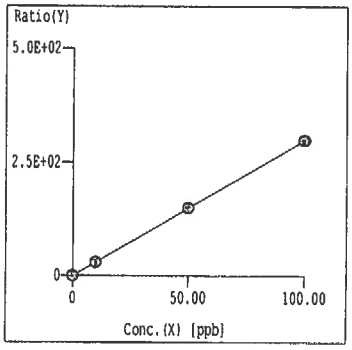
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 6.241E-002*X +5.561E-003
X = 1.602E+001*Y -8.910E-002
DL = 2.338E-02 ppb
BEC = 8.910E-02 ppb

Step Mass Element (2) 51 V — ISTD 45 — Unit ppb



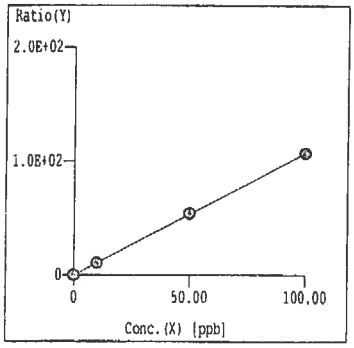
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 2.502E+000*X +1.107E+000
X = 3.996E-001*Y -4.425E-001
DL = 3.662E-02 ppb
BEC = 4.425E-01 ppb

Step Mass Element (2) 52 Cr — ISTD 45 — Unit ppb



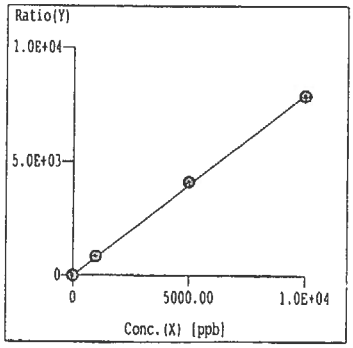
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 2.984E+000*X +3.551E-001
X = 3.351E-001*Y -1.190E-001
DL = 3.081E-02 ppb
BEC = 1.190E-01 ppb

Step Mass Element (3) 55 Mn — ISTD 45 — Unit ppb



Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 1.071E+000*X +5.796E-002
X = 9.336E-001*Y -5.411E-002
DL = 4.585E-03 ppb
BEC = 5.411E-02 ppb

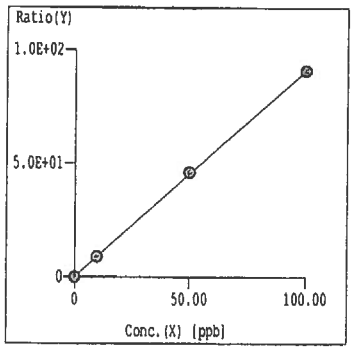
Step Mass Element (1) 56 Fe — ISTD 45 — Unit ppb



Curve Fit: Y=aX+[blank]
r = 0.9998
Y = 7.945E-001*X +1.774E+000
X = 1.259E+000*Y -2.233E+000
DL = 1.277E-02 ppb
BEC = 2.233 ppb

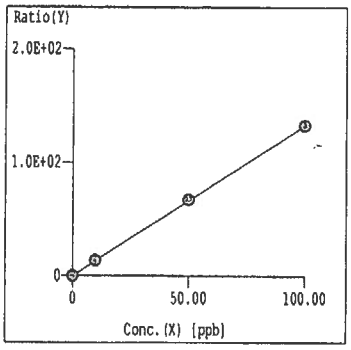
=== Graph Detail ===

Step Mass Element	ISTD	Unit
(3) 59 Co	45	ppb



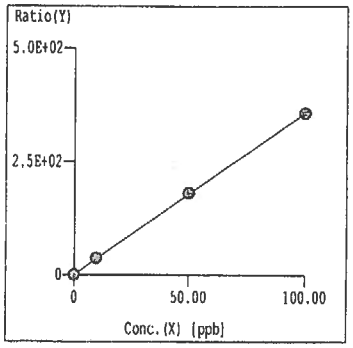
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 9.101E-001*X +5.470E-003
X = 1.099E+000*Y -6.010E-003
DL = 1.914E-03 ppb
BEC = 6.010E-03 ppb

Step Mass Element	ISTD	Unit
(2) 60 Ni	45	ppb



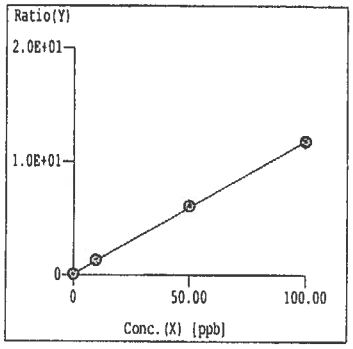
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 1.328E+000*X +4.397E-002
X = 7.529E-001*Y -3.310E-002
DL = 5.153E-03 ppb
BEC = 3.310E-02 ppb

Step Mass Element	ISTD	Unit
(2) 63 Cu	45	ppb



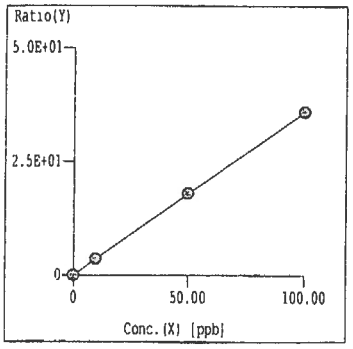
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 3.574E+000*X +4.146E-001
X = 2.798E-001*Y -1.160E-001
DL = 1.966E-02 ppb
BEC = 1.160E-01 ppb

Step Mass Element	ISTD	Unit
(3) 66 Zn	45	ppb



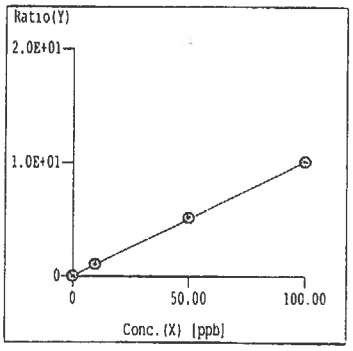
Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 1.175E-001*X +6.851E-002
X = 8.507E+000*Y -5.828E-001
DL = 4.014E-02 ppb
BEC = 5.828E-01 ppb

Step Mass Element	ISTD	Unit
(2) 75 As	45	ppb



Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 3.585E-001*X +2.918E-002
X = 2.790E+000*Y -8.139E-002
DL = 1.661E-02 ppb
BEC = 8.139E-02 ppb

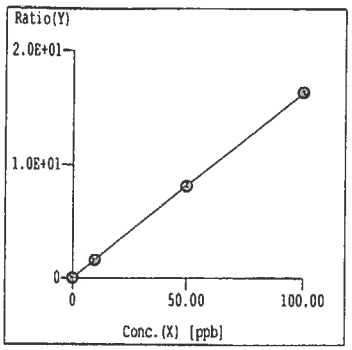
Step Mass Element	ISTD	Unit
(1) 78 Se	72	ppb



Curve Fit: Y=aX+[blank]
r = 0.9999
Y = 1.012E-001*X +3.890E-003
X = 9.882E+000*Y -3.844E-002
DL = 3.719E-02 ppb
BEC = 3.844E-02 ppb

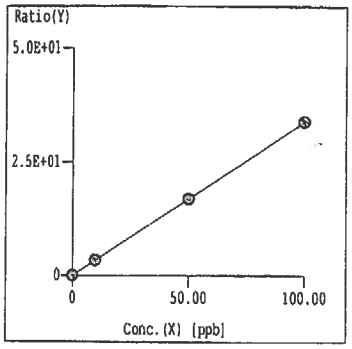
=== Graph Detail ===

Step Mass Element	ISTD	Unit
(3) 95 Mo	115	ppb



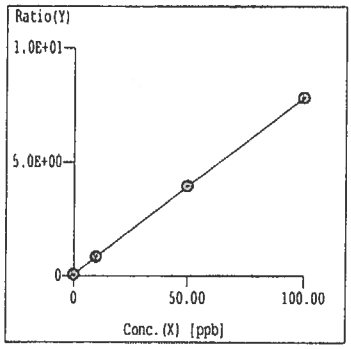
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 1.632E-001*X +1.655E-003
X = 6.127E+000*Y -1.014E-002
DL = 2.925E-03 ppb
BEC = 1.014E-02 ppb

Step Mass Element	ISTD	Unit
(3) 107 Ag	115	ppb



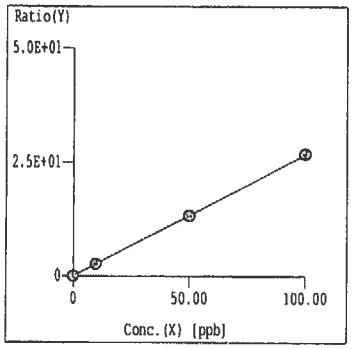
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 3.393E-001*X +4.749E-003
X = 2.947E+000*Y -1.400E-002
DL = 2.571E-03 ppb
BEC = 1.400E-02 ppb

Step Mass Element	ISTD	Unit
(3) 111 Cd	115	ppb



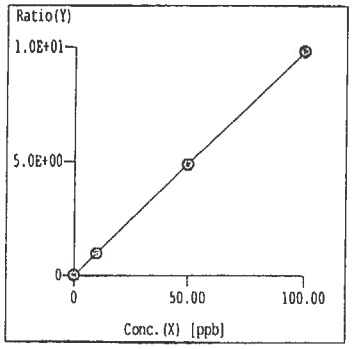
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 7.764E-002*X +6.122E-002
X = 1.288E+001*Y -7.885E-001
DL = 4.971E-02 ppb
BEC = 7.885E-01 ppb

Step Mass Element	ISTD	Unit
(3) 121 Sb	115	ppb



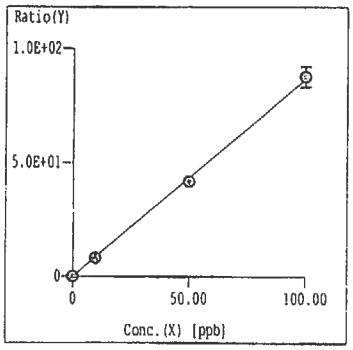
Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 2.671E-001*X +1.425E-002
X = 3.744E+000*Y -5.335E-002
DL = 8.133E-03 ppb
BEC = 5.335E-02 ppb

Step Mass Element	ISTD	Unit
(3) 137 Ba	115	ppb



Curve Fit: Y=aX+[blank]
r = 1.0000
Y = 9.803E-002*X +3.058E-003
X = 1.020E+001*Y -3.120E-002
DL = 4.032E-03 ppb
BEC = 3.120E-02 ppb

Step Mass Element	ISTD	Unit
(3) 205 Tl	209	ppb

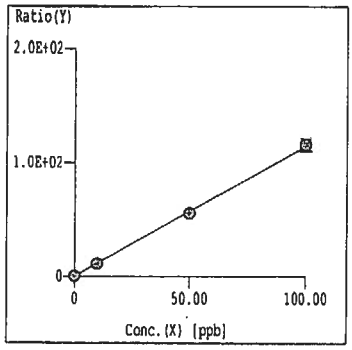


Curve Fit: Y=aX+[blank]
r = 0.9996
Y = 8.675E-001*X +8.677E-003
X = 1.153E+000*Y -1.000E-002
DL = 6.657E-03 ppb
BEC = 1.000E-02 ppb

7645

=== Graph Detail ===

Step	Mass Element	ISTD	Unit
(3)	208 Pb	209	ppb



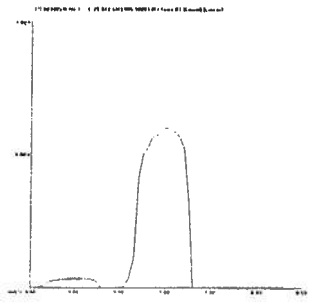
Curve Fit: Y=aX+[blank]
r = 0.9997
Y = 1.146E+000*X +2.005E-001
X = 8.723E-001*Y -1.749E-001
DL = 1.303E-02 ppb
BEC = 1.749E-01 ppb

6020 QC Tune Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30001.D
Date Acquired:	Dec 27 2006 10:14 am
Acq. Method:	TN6020.M
Operator:	JEE
Sample Name:	6020tunchk
Misc Info:	
Vial Number:	1301
Current Method:	C:\ICPCHEM\1\METHODS\TN6020.M

RSD (%)

Element	Actual	Required	Flag
7 Li	0.22	5.00	
59 Co	0.60	5.00	
115 In	0.95	5.00	
205 Tl	0.56	5.00	



7 Li

Mass Calib.

Actual: 7.00

Required: 6.90 - 7.10

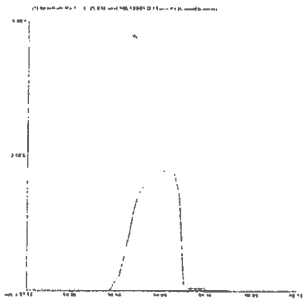
Flag:

Peak Width

Actual: 0.60

Required: 0.90

Flag:



59 Co

Mass Calib.

Actual: 59.05

Required: 58.90 - 59.10

Flag:

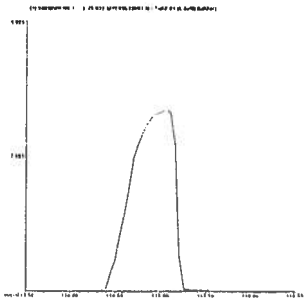
Peak Width

Actual: 0.60

Required: 0.90

Flag:

7048



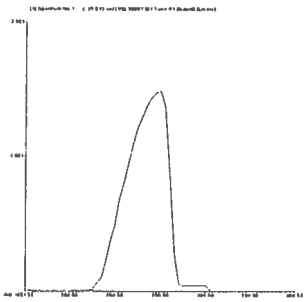
115 In

Mass Calib.

Actual:	115.00	
Required:	114.90 -	115.10
Flag:		

Peak Width

Actual:	0.60
Required:	0.90
Flag:	



205 Tl

Mass Calib.

Actual:	204.95	
Required:	204.90 -	205.10
Flag:		

Peak Width

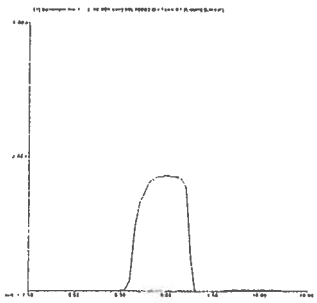
Actual:	0.55
Required:	0.90
Flag:	

200.8 QC Tune Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30002.D
Date Acquired:	Dec 27 2006 10:19 am
Acq. Method:	TN200_8.M
Operator:	JEE
Sample Name:	2008tunchk
Misc Info:	
Vial Number:	1302
Current Method:	C:\ICPCHEM\1\METHODS\TN200_8.M

RSD (%)

Element	Actual	Required	Flag
9 Be	0.49	5.00	
24 Mg	1.47	5.00	
59 Co	0.74	5.00	
115 In	0.49	5.00	
208 Pb	0.46	5.00	



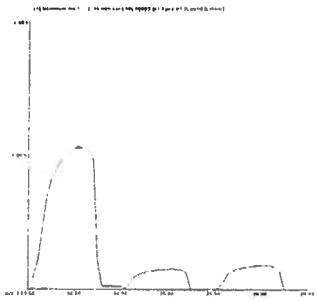
9 Be

Mass Calib.

Actual:	9.00	
Required:	8.90 -	9.10
Flag:		

Peak Width

Actual:	0.65
Required:	1.00
Flag:	



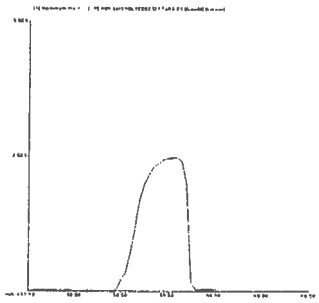
24 Mg

Mass Calib.

Actual:	24.05	
Required:	23.90 -	24.10
Flag:		

Peak Width

Actual:	0.65
Required:	1.00
Flag:	



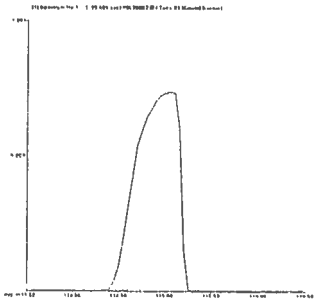
59 Co

Mass Calib.

Actual:	59.05	
Required:	58.90 -	59.10
Flag:		

Peak Width

Actual:	0.65
Required:	1.00
Flag:	



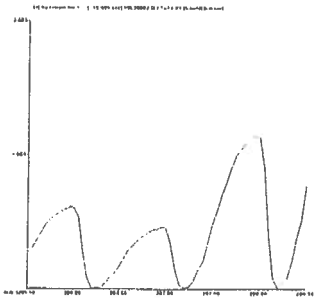
115 In

Mass Calib.

Actual:	115.00	
Required:	114.90 -	115.10
Flag:		

Peak Width

Actual:	0.65
Required:	1.00
Flag:	



208 Pb

Mass Calib.

Actual:	207.90	
Required:	207.90 -	208.10
Flag:		

Peak Width

Actual:	0.55
Required:	1.00
Flag:	

Tune Result: Pass

Calibration Blank QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30003.D\98
Date Acquired:	Dec 27 2006 12:03 pm
Operator:	JEE
Sample Name:	BLNK
Misc Info:	
Vial Number:	1101
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 11:05 am
Sample Type:	CalBlk
Total Dil Factor:	1.00

QC&ISTD Elements

Element		CPS Mean		SD	CPS RSD(%)
6	Li	518694.41	P	2378.00	0.46
7	Li	36014.27	P	301.00	0.84
9	Be	38.89	P	3.85	9.90
11	B	3809.60	P	121.00	3.18
23	Na	260213.00	P	4499.00	1.73
24	Mg	46306.92	P	1885.00	4.07
27	Al	32907.85	P	1735.00	5.27
39	K	15783.65	P	138.80	0.88
40	Ca	48381.86	P	533.50	1.10
45	Sc	735960.63	P	6638.00	0.90
45	Sc	90935.76	P	1333.00	1.47
45	Sc	2648372.00	A	11550.00	0.44
47	Ti	190.01	P	14.53	7.65
51	V	879.59	P	25.27	2.87
52	Cr	321.78	P	14.79	4.60
55	Mn	2433.67	P	161.80	6.65
56	Fe	22683.99	P	612.50	2.70
59	Co	363.35	P	23.33	6.42
60	Ni	113.33	P	5.81	5.13
63	Cu	1121.84	P	34.22	3.05
66	Zn	4064.15	P	150.20	3.70
72	Ge	193516.91	P	2993.00	1.55
72	Ge	54842.45	P	1217.00	2.22
72	Ge	568040.63	P	1694.00	0.30
75	As	25.78	P	2.04	7.90
78	Se	7.33	P	1.76	24.05
88	Sr	2375.88	P	135.00	5.68
89	Y	4069325.00	A	11910.00	0.29
95	Mo	132.23	P	9.62	7.28
107	Ag	225.57	P	41.41	18.36
111	Cd	2003.92	P	86.76	4.33
115	In	3147827.00	A	19370.00	0.62
118	Sn	2196.96	P	20.83	0.95
121	Sb	768.95	P	53.99	7.02
137	Ba	102.23	P	13.88	13.58
159	Tb	2970566.00	A	6910.00	0.23
205	Tl	142.23	P	11.71	8.23
208	Pb	4290.52	P	340.40	7.93
209	Bi	1235620.00	A	6256.00	0.51
235	U	7.78	P	6.94	89.21
238	U	117.78	P	8.39	7.12

Calibration Blank QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30004.D\98
Date Acquired:	Dec 27 2006 12:12 pm
Operator:	JEE
Sample Name:	S0
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:08 pm
Sample Type:	CalBlk
Total Dil Factor:	1.00

QC&ISTD Elements

Element		CPS Mean		SD	CPS RSD(%)
6	Li	516131.41	P	6243.00	1.21
7	Li	36059.87	P	632.30	1.75
9	Be	25.56	P	10.71	41.91
11	B	3572.84	P	114.80	3.21
23	Na	274916.81	P	1420.00	0.52
24	Mg	38088.38	P	1069.00	2.81
27	Al	16190.52	P	262.20	1.62
39	K	18333.56	P	78.20	0.43
40	Ca	36022.97	P	324.40	0.90
45	Sc	751121.69	P	3384.00	0.45
45	Sc	105116.80	P	298.30	0.28
45	Sc	2578761.00	A	17760.00	0.69
47	Ti	143.34	P	11.55	8.06
51	V	1164.06	P	32.44	2.79
52	Cr	373.34	P	32.88	8.81
55	Mn	1494.59	P	36.57	2.45
56	Fe	13326.28	P	83.29	0.63
59	Co	141.12	P	15.75	11.16
60	Ni	46.22	P	2.52	5.46
63	Cu	435.79	P	23.38	5.37
66	Zn	1766.87	P	49.11	2.78
72	Ge	182569.20	P	1980.00	1.08
72	Ge	62725.95	P	479.50	0.76
72	Ge	550487.19	P	4450.00	0.81
75	As	30.67	P	2.00	6.52
78	Se	7.11	P	2.34	32.92
88	Sr	1835.77	P	97.17	5.29
89	Y	3932869.00	A	36270.00	0.92
95	Mo	51.11	P	5.09	9.96
107	Ag	146.67	P	8.82	6.01
111	Cd	1890.87	P	50.37	2.66
115	In	3088381.00	A	17730.00	0.57
118	Sn	1835.78	P	24.12	1.31
121	Sb	440.03	P	20.82	4.73
137	Ba	94.45	P	3.85	4.08
159	Tb	2902786.00	A	9484.00	0.33
205	Tl	102.23	P	24.11	23.59
208	Pb	2356.87	P	49.10	2.08
209	Bi	1175901.00	A	17080.00	1.45
235	U	10.00	P	3.33	33.33
238	U	44.45	P	21.43	48.22

Calibration Standard QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30005.D\98L30005.D#
Date Acquired:	Dec 27 2006 12:21 pm
Operator:	JEE
Sample Name:	S3 10
Misc Info:	
Vial Number:	1105
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:17 pm
Sample Type:	CalStd
Total Dil Factor:	1.00

QC&ISTD Elements

Element	CPS Mean		SD	CPS RSD(%)
6 Li	525419.81	P	5831.00	1.11
7 Li	95959.36	P	1699.00	1.77
9 Be	19453.79	P	184.50	0.95
11 B	15292.70	P	443.40	2.90
23 Na	2042359.00	A	12380.00	0.61
24 Mg	8779469.00	A	138200.00	1.57
27 Al	11876700.00	A	121800.00	1.03
39 K	296208.09	P	142.90	0.05
40 Ca	4621897.00	A	27730.00	0.60
45 Sc	754763.88	P	3425.00	0.45
45 Sc	108304.00	P	537.30	0.50
45 Sc	2651992.00	A	16120.00	0.61
47 Ti	16841.52	P	383.80	2.28
51 V	27899.96	P	351.80	1.26
52 Cr	32681.08	P	279.00	0.85
55 Mn	281777.31	P	2548.00	0.90
56 Fe	6345061.00	A	35600.00	0.56
59 Co	237003.70	P	1971.00	0.83
60 Ni	14804.12	P	114.20	0.77
63 Cu	40325.53	P	201.10	0.50
66 Zn	34743.61	P	431.60	1.24
72 Ge	183978.00	P	208.50	0.11
72 Ge	64111.68	P	253.40	0.40
72 Ge	565318.13	P	3033.00	0.54
75 As	3905.07	P	44.40	1.14
78 Se	1960.19	P	14.62	0.75
88 Sr	302185.31	P	1116.00	0.37
89 Y	3991680.00	A	32090.00	0.80
95 Mo	49138.00	P	162.30	0.33
107 Ag	106350.30	P	821.60	0.77
111 Cd	26207.80	P	225.20	0.86
115 In	3132986.00	A	13690.00	0.44
118 Sn	68507.41	P	240.80	0.35
121 Sb	82964.97	P	333.20	0.40
137 Ba	30082.68	P	501.60	1.67
159 Tb	2960684.00	A	30660.00	1.04
205 Tl	99202.88	P	369.00	0.37
208 Pb	134546.41	P	270.70	0.20
209 Bi	1221705.00	A	9126.00	0.75
235 U	792.28	P	120.30	15.18
238 U	103806.50	P	746.50	0.72

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	525419.81	1.11	516131.41	101.8	60 - 125	
45 Sc	754763.88	0.45	751121.75	100.5	60 - 125	
45 Sc	108303.98	0.50	105116.80	103.0	60 - 125	
45 Sc	2651992.30	0.61	2578760.50	102.8	60 - 125	
72 Ge	183978.00	0.11	182569.23	100.8	60 - 125	
72 Ge	64111.68	0.40	62725.95	102.2	60 - 125	
72 Ge	565318.06	0.54	550487.25	102.7	60 - 125	
115 In	3132986.30	0.44	3088381.00	101.4	60 - 125	
159 Tb	2960684.00	1.04	2902786.50	102.0	60 - 125	
209 Bi	1221705.30	0.75	1175901.50	103.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

7854

Calibration Standard QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30006.D\98L30006.D#
Date Acquired: Dec 27 2006 12:29 pm
Operator: JEE
Sample Name: S4 50
Misc Info:
Vial Number: 1106
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update: Dec 27 2006 12:25 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	CPS RSD(%)
6 Li	524395.69	P	1811.00	0.35
7 Li	337212.59	P	3830.00	1.14
9 Be	97622.82	P	1040.00	1.07
11 B	64163.19	P	967.20	1.51
23 Na	8582468.00	A	17430.00	0.20
24 Mg	43072632.00	A	247500.00	0.57
27 Al	58451800.00	A	780300.00	1.33
39 K	1398947.00	A	9620.00	0.69
40 Ca	21838370.00	A	83530.00	0.38
45 Sc	732753.69	P	450.10	0.06
45 Sc	105866.10	P	864.60	0.82
45 Sc	2618542.00	A	31190.00	1.19
47 Ti	82276.35	P	1290.00	1.57
51 V	133569.91	P	275.60	0.21
52 Cr	158450.41	P	406.50	0.26
55 Mn	1418186.00	A	16430.00	1.16
56 Fe	30019640.00	A	39370.00	0.13
59 Co	1206109.00	A	7462.00	0.62
60 Ni	71060.51	P	117.70	0.17
63 Cu	191203.30	P	167.20	0.09
66 Zn	158764.70	P	1698.00	1.07
72 Ge	183132.30	P	132.50	0.07
72 Ge	64894.72	P	737.50	1.14
72 Ge	571550.13	P	3304.00	0.58
75 As	19076.74	P	101.30	0.53
78 Se	9429.90	P	73.93	0.78
88 Sr	1607791.00	A	9979.00	0.62
89 Y	3904485.00	A	6744.00	0.17
95 Mo	244946.70	P	1083.00	0.44
107 Ag	513109.41	P	3402.00	0.66
111 Cd	119522.00	P	2314.00	1.94
115 In	3024742.00	A	30190.00	1.00
118 Sn	328871.31	P	1565.00	0.48
121 Sb	400865.81	P	2149.00	0.54
137 Ba	147121.50	P	871.60	0.59
159 Tb	2965921.00	A	6207.00	0.21
205 Tl	499204.50	P	878.80	0.18
208 Pb	664973.69	P	2543.00	0.38
209 Bi	1200159.00	A	17010.00	1.42
235 U	4019.77	P	107.90	2.68
238 U	527040.13	P	3344.00	0.63

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	524395.69	0.35	516131.41	101.6	60 - 125	
45 Sc	732753.69	0.06	751121.75	97.6	60 - 125	
45 Sc	105866.15	0.82	105116.80	100.7	60 - 125	
45 Sc	2618542.50	1.19	2578760.50	101.5	60 - 125	
72 Ge	183132.28	0.07	182569.23	100.3	60 - 125	
72 Ge	64894.72	1.14	62725.95	103.5	60 - 125	
72 Ge	571550.13	0.58	550487.25	103.8	60 - 125	
115 In	3024742.50	1.00	3088381.00	97.9	60 - 125	
159 Tb	2965920.80	0.21	2902786.50	102.2	60 - 125	
209 Bi	1200159.00	1.42	1175901.50	102.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

--- :Element Failures
0 :ISTD Failures

--- :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

7855

Calibration Standard QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30007.D\98L30007.D#
Date Acquired:	Dec 27 2006 12:38 pm
Operator:	JEE
Sample Name:	S5 100
Misc Info:	
Vial Number:	1107
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:34 pm
Sample Type:	CalStd
Total Dil Factor:	1.00

QC&ISTD Elements

Element	CPS Mean		SD	CPS RSD(%)
6 Li	508754.41	P	4981.00	0.98
7 Li	640068.81	M	7059.00	1.10
9 Be	193208.80	P	1895.00	0.98
11 B	123199.30	P	537.60	0.44
23 Na	15822280.00	A	86540.00	0.55
24 Mg	81543832.00	A	991500.00	1.22
27 Al	110410800.00	A	1084000.00	0.98
39 K	2579185.00	A	25650.00	0.99
40 Ca	40335440.00	A	249800.00	0.62
45 Sc	703419.81	P	3920.00	0.56
45 Sc	101805.80	P	492.20	0.48
45 Sc	2552999.00	A	37950.00	1.49
47 Ti	159242.70	P	1738.00	1.09
51 V	255949.91	P	807.20	0.32
52 Cr	304107.81	P	1423.00	0.47
55 Mn	2729249.00	A	22040.00	0.81
56 Fe	55434088.00	A	195700.00	0.35
59 Co	2316873.00	A	8918.00	0.38
60 Ni	134880.41	P	157.10	0.12
63 Cu	363344.09	P	1078.00	0.30
66 Zn	300165.69	P	2365.00	0.79
72 Ge	177289.80	P	914.20	0.52
72 Ge	63096.64	P	446.80	0.71
72 Ge	572470.81	P	4044.00	0.71
75 As	36491.81	P	151.70	0.42
78 Se	17862.52	P	125.10	0.70
88 Sr	3055240.00	A	10160.00	0.33
89 Y	3771537.00	A	21200.00	0.56
95 Mo	470579.09	P	357.20	0.08
107 Ag	976127.88	P	1426.00	0.15
111 Cd	224953.09	P	1385.00	0.62
115 In	2876038.00	A	17670.00	0.61
118 Sn	627382.00	P	3592.00	0.57
121 Sb	770343.38	P	3460.00	0.45
137 Ba	282663.00	P	1008.00	0.36
159 Tb	2846473.00	A	11520.00	0.40
205 Tl	976081.88	P	4582.00	0.47
208 Pb	1290399.00	P	6194.00	0.48
209 Bi	1114631.00	M	53640.00	4.81
235 U	7577.23	P	240.70	3.18
238 U	1038122.00	P	3047.00	0.29

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	508754.41	0.98	516131.41	98.6	60 - 125	
45 Sc	703419.81	0.56	751121.75	93.6	60 - 125	
45 Sc	101805.83	0.48	105116.80	96.9	60 - 125	
45 Sc	2552998.80	1.49	2578760.50	99.0	60 - 125	
72 Ge	177289.86	0.52	182569.23	97.1	60 - 125	
72 Ge	63096.64	0.71	62725.95	100.6	60 - 125	
72 Ge	572470.81	0.71	550487.25	104.0	60 - 125	
115 In	2876038.50	0.61	3088381.00	93.1	60 - 125	
159 Tb	2846473.50	0.40	2902786.50	98.1	60 - 125	
209 Bi	1114630.90	4.81	1175901.50	94.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

7056

ICV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30008.D\98L30008.D#
Date Acquired:	Dec 27 2006 12:46 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICV
Misc Info:	
Vial Number:	1203
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICV1
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc. RSD(%)	Expected	QC Range(%)	Flag
7 Li	56.33	447298.5 ppb	1.59	60.00	90 - 110	
9 Be	56.82	130950.3 ppb	0.24	60.00	90 - 110	
11 B	59.44	89060.5 ppb	0.41	60.00	90 - 110	
23 Na	6337.00	10820910.0 ppb	0.41	6000.00	90 - 110	
24 Mg	6405.00	57125568.0 ppb	1.08	6000.00	90 - 110	
27 Al	6369.00	76930168.0 ppb	0.68	6000.00	90 - 110	
39 K	6218.00	1752124.0 ppb	0.74	6000.00	90 - 110	
40 Ca	6214.00	26885350.0 ppb	0.43	6000.00	90 - 110	
47 Ti	60.47	104853.5 ppb	0.71	60.00	90 - 110	
51 V	60.16	166725.1 ppb	0.20	60.00	90 - 110	
52 Cr	60.40	198557.4 ppb	0.47	60.00	90 - 110	
55 Mn	60.74	1806546.0 ppb	0.70	60.00	90 - 110	
56 Fe	6136.00	36483848.0 ppb	0.51	6000.00	90 - 110	
59 Co	60.52	1528450.0 ppb	1.31	60.00	90 - 110	
60 Ni	60.32	88125.4 ppb	0.31	60.00	90 - 110	
63 Cu	60.73	239067.4 ppb	0.48	60.00	90 - 110	
66 Zn	58.34	192155.6 ppb	0.32	60.00	90 - 110	
75 As	58.66	23150.6 ppb	0.66	60.00	90 - 110	
78 Se	58.77	10835.4 ppb	0.33	60.00	90 - 110	
88 Sr	62.26	2021497.0 ppb	0.25	60.00	90 - 110	
89 Y	--------	4099562.0 ppb	--------	60.00	90 - 110	
95 Mo	60.61	309230.5 ppb	0.20	60.00	90 - 110	
107 Ag	61.45	651832.7 ppb	0.17	60.00	90 - 110	
111 Cd	59.37	145973.9 ppb	0.60	60.00	90 - 110	
118 Sn	60.08	409755.1 ppb	0.17	60.00	90 - 110	
121 Sb	61.12	510666.9 ppb	0.18	60.00	90 - 110	
137 Ba	60.01	183947.8 ppb	0.87	60.00	90 - 110	
205 Tl	57.52	643490.0 ppb	0.17	60.00	90 - 110	
208 Pb	58.00	859897.8 ppb	0.23	60.00	90 - 110	
235 U	0.42	5283.6 ppb	3.96	0.42	90 - 110	
238 U	57.69	689934.9 ppb	0.38	59.58	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	609303.1	2.04	516131.41	118.1	60 - 125	
45 Sc	748078.6	0.37	751121.75	99.6	60 - 125	
45 Sc	109945.8	0.62	105116.80	104.6	60 - 125	
45 Sc	2774356.8	0.19	2578760.50	107.6	60 - 125	
72 Ge	182060.5	0.22	182569.23	99.7	60 - 125	
72 Ge	66224.8	0.32	62725.95	105.6	60 - 125	
72 Ge	601792.0	0.32	550487.25	109.3	60 - 125	
115 In	3125240.3	0.67	3088381.00	101.2	60 - 125	
159 Tb	3089025.5	0.43	2902786.50	106.4	60 - 125	
209 Bi	1289344.5	0.24	1175901.50	109.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed

0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass

ISTD: Pass

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30009.D\98L30009.D#
Date Acquired:	Dec 27 2006 12:55 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICB
Misc Info:	
Vial Number:	1101
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0889	38610.3 ppb	19.31	1.00	
9 Be	0.0063	40.0 ppb	127.32	1.00	
11 B	0.1786	3996.3 ppb	26.63	1.00	
23 Na	5.3080	268339.0 ppb	5.09	1.00	
24 Mg	0.7014	43611.1 ppb	3.49	1.00	
27 Al	1.2210	29704.4 ppb	3.04	1.00	
39 K	1.5400	18459.3 ppb	48.66	1.00	
40 Ca	4.1960	51276.4 ppb	2.90	1.00	
47 Ti	0.0104	158.9 ppb	192.97	1.00	
51 V	-0.0415	1038.7 ppb	9.83	1.00	
52 Cr	-0.0047	352.9 ppb	111.38	1.00	
55 Mn	0.0255	2183.6 ppb	22.77	1.00	
56 Fe	0.1345	13359.6 ppb	32.29	1.00	
59 Co	0.0052	262.2 ppb	15.96	1.00	
60 Ni	0.0295	86.0 ppb	10.11	1.00	
63 Cu	0.0443	592.9 ppb	8.75	1.00	
66 Zn	0.5907	3534.0 ppb	2.53	1.00	
75 As	0.0145	35.6 ppb	72.91	1.00	
78 Se	0.0134	9.1 ppb	186.91	1.00	
88 Sr	0.0192	2341.0 ppb	129.13	1.00	
89 Y	--------	3852605.0 ppb	--------	1.00	
95 Mo	0.0249	172.2 ppb	2.84	1.00	
107 Ag	0.0007	150.0 ppb	248.97	1.00	
111 Cd	-0.0036	1835.5 ppb	1320.10	1.00	
118 Sn	0.0405	2054.7 ppb	29.89	1.00	
121 Sb	0.1134	1341.2 ppb	14.43	1.00	
137 Ba	0.0031	101.1 ppb	491.87	1.00	
205 Tl	0.0766	907.9 ppb	0.69	1.00	
208 Pb	-0.0540	1674.6 ppb	8.61	1.00	
235 U	0.0001	11.1 ppb	631.59	1.00	
238 U	0.0074	128.9 ppb	16.30	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	544480.4	1.00	516131.41	105.5	60 - 125	
45 Sc	710229.7	0.36	751121.75	94.6	60 - 125	
45 Sc	103517.8	0.77	105116.80	98.5	60 - 125	
45 Sc	2561901.8	0.90	2578760.50	99.3	60 - 125	
72 Ge	173530.0	0.48	182569.23	95.0	60 - 125	
72 Ge	61504.4	0.37	62725.95	98.1	60 - 125	
72 Ge	536199.4	0.41	550487.25	97.4	60 - 125	
115 In	3011681.8	0.25	3088381.00	97.5	60 - 125	
159 Tb	2893493.8	0.94	2902786.50	99.7	60 - 125	
209 Bi	1208391.6	0.46	1175901.50	102.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

7858

Sample QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30010.D\98L30010.D#
Date Acquired:	Dec 27 2006 01:03 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	MRL1
Misc Info:	
Vial Number:	1207
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	52974.4	0.0000	0.7040	ppb	13.05	400.00	
9 Be	# 3	6	2323.6	0.0000	0.8934	ppb	3.01	400.00	
11 B	# 3	6	9689.5	0.0000	3.1490	ppb	3.69	400.00	
23 Na	# 1	45	441278.0	0.0000	81.0400	ppb	0.99	300000.00	
24 Mg	# 3	45	1064381.0	0.0000	107.5000	ppb	0.94	200000.00	
27 Al	# 3	45	1403624.0	0.0000	107.6000	ppb	1.75	200000.00	
39 K	# 2	45	46802.9	0.0000	87.1000	ppb	1.06	100000.00	
40 Ca	# 1	45	518109.2	0.0000	102.7000	ppb	0.31	300000.00	
47 Ti	# 3	45	2100.3	0.0000	1.0490	ppb	3.39	3000.00	
51 V	# 2	45	5014.1	0.0000	1.2490	ppb	2.73	3000.00	
52 Cr	# 2	45	4121.4	0.0000	1.0470	ppb	3.80	3000.00	
55 Mn	# 3	45	32940.7	0.0000	0.9860	ppb	1.88	3000.00	
56 Fe	# 1	45	764910.7	0.0000	117.0000	ppb	0.32	100000.00	
59 Co	# 3	45	26398.9	0.0000	0.9750	ppb	1.30	3000.00	
60 Ni	# 2	45	1775.0	0.0000	1.0950	ppb	0.11	3000.00	
63 Cu	# 2	45	4889.9	0.0000	1.0390	ppb	1.41	3000.00	
66 Zn	# 3	45	35553.6	0.0000	9.6460	ppb	0.51	3000.00	
75 As	# 2	45	448.5	0.0000	0.9748	ppb	1.90	3000.00	
78 Se	# 1	72	191.6	0.0000	0.9580	ppb	7.42	3000.00	
88 Sr	# 3	72	33954.3	0.0000	0.9680	ppb	0.64	3000.00	
89 Y	# 3	---	4380025.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	5524.8	0.0000	0.9938	ppb	1.13	3000.00	
107 Ag	# 3	115	11966.3	0.0000	1.0320	ppb	1.59	250.00	
111 Cd	# 3	115	4804.1	0.0000	1.0470	ppb	1.77	3000.00	
118 Sn	# 3	115	10044.7	0.0000	1.0980	ppb	2.80	3000.00	
121 Sb	# 3	115	10159.3	0.0000	1.0750	ppb	1.47	3000.00	
137 Ba	# 3	115	3302.8	0.0000	0.9681	ppb	4.70	3000.00	
205 Tl	# 3	209	11467.4	0.0000	0.9246	ppb	2.62	3000.00	
208 Pb	# 3	209	17261.3	0.0000	0.8899	ppb	2.89	3000.00	
235 U	# 3	209	102.2	0.0000	0.0066	ppb	20.13	3000.00	
238 U	# 3	209	11968.9	0.0000	0.9083	ppb	1.29	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	677682.19	1.12	516131.41	131.3	60 - 125	ISFail
45 Sc # 1	807740.38	0.16	751121.75	107.5	60 - 125	
45 Sc # 2	118435.30	0.24	105116.80	112.7	60 - 125	
45 Sc # 3	2956757.00	0.06	2578760.50	114.7	60 - 125	
72 Ge # 1	189915.77	0.86	182569.23	104.0	60 - 125	
72 Ge # 2	68683.29	0.10	62725.95	109.5	60 - 125	
72 Ge # 3	611645.63	0.47	550487.25	111.1	60 - 125	
115 In # 3	3371644.50	0.32	3088381.00	109.2	60 - 125	
159 Tb # 3	3260743.50	0.48	2902786.50	112.3	60 - 125	
209 Bi # 3	1414275.50	0.29	1175901.50	120.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7659

ICS-A QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30011.D\98L30011.D#
Date Acquired:	Dec 27 2006 01:12 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSA
Misc Info:	
Vial Number:	1201
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-A
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.23	36339.6 ppb	31.81	---	
9 Be	0.01	44.4 ppb	108.76	---	
11 B	1.73	5493.6 ppb	4.71	---	
23 Na	96090.00	156026300.0 ppb	0.14	---	
24 Mg	97600.00	784438210.0 ppb	0.94	---	
27 Al	98050.00	1067813000.0 ppb	0.32	---	
39 K	93860.00	23296870.0 ppb	0.70	---	
40 Ca	98250.00	413479900.0 ppb	0.44	---	
47 Ti	2234.00	3488713.0 ppb	0.98	---	
51 V	0.38	2025.3 ppb	0.62	---	
52 Cr	0.69	2374.7 ppb	1.70	---	
55 Mn	3.20	87283.3 ppb	0.23	---	
56 Fe	97820.00	566198780.0 ppb	0.08	---	
59 Co	0.69	15818.1 ppb	1.84	---	
60 Ni	0.93	1245.8 ppb	1.91	---	
63 Cu	1.92	7132.0 ppb	0.96	---	
66 Zn	5.91	19089.3 ppb	2.79	---	
75 As	0.24	113.1 ppb	4.91	---	
78 Se	0.11	37.8 ppb	34.85	---	
88 Sr	2.00	103903.2 ppb	1.32	---	
89 Y	--------	3886161.0 ppb	--------	---	
95 Mo	2264.00	10528220.0 ppb	0.45	---	
107 Ag	0.06	714.5 ppb	7.25	---	
111 Cd	1.12	4219.4 ppb	28.75	---	
118 Sn	0.12	2428.1 ppb	10.07	---	
121 Sb	0.16	1609.1 ppb	12.26	---	
137 Ba	0.90	2591.5 ppb	0.94	---	
205 Tl	0.06	660.0 ppb	2.75	---	
208 Pb	0.45	7474.6 ppb	5.55	---	
235 U	0.00	10.0 ppb	590.90	---	
238 U	0.01	141.1 ppb	11.09	---	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	500506.2	1.26	516131.41	97.0	60 - 125	
45 Sc	728541.6	0.31	751121.75	97.0	60 - 125	
45 Sc	97852.1	0.37	105116.80	93.1	60 - 125	
45 Sc	2501863.3	1.24	2578760.50	97.0	60 - 125	
72 Ge	260269.8	0.18	182569.23	142.6	60 - 125	ISFail
72 Ge	86152.6	0.28	62725.95	137.3	60 - 125	ISFail
72 Ge	934961.6	2.81	550487.25	169.8	60 - 125	ISFail
115 In	2848696.5	1.62	3088381.00	92.2	60 - 125	
159 Tb	2924893.0	1.04	2902786.50	100.8	60 - 125	
209 Bi	1040393.3	0.32	1175901.50	88.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7869

ICS-AB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30012.D\98L30012.D#
Date Acquired:	Dec 27 2006 01:21 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSAB
Misc Info:	
Vial Number:	1202
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-AB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	18.54	139648.7 ppb	1.49	20.00	80 - 120	
9 Be	17.35	31776.7 ppb	1.28	20.00	80 - 120	
11 B	19.91	25922.9 ppb	1.79	20.00	80 - 120	
23 Na	95610.00	147206000.0 ppb	0.26	100000.00	80 - 120	
24 Mg	96330.00	754036990.0 ppb	0.48	100000.00	80 - 120	
27 Al	98210.00	1041879000.0 ppb	0.37	100000.00	80 - 120	
39 K	93520.00	22119960.0 ppb	0.53	100000.00	80 - 120	
40 Ca	96970.00	386932700.0 ppb	0.58	100000.00	80 - 120	
47 Ti	2201.00	3346821.0 ppb	0.59	2000.00	80 - 120	
51 V	20.06	47835.9 ppb	0.63	20.00	80 - 120	
52 Cr	20.32	56869.0 ppb	0.80	20.00	80 - 120	
55 Mn	21.64	566337.1 ppb	0.80	20.00	80 - 120	
56 Fe	97100.00	532881890.0 ppb	0.29	100000.00	80 - 120	
59 Co	18.44	409040.7 ppb	0.73	20.00	80 - 120	
60 Ni	19.45	24130.8 ppb	1.07	20.00	80 - 120	
63 Cu	20.46	68567.4 ppb	0.97	20.00	80 - 120	
66 Zn	23.19	68089.2 ppb	1.46	20.00	80 - 120	
75 As	19.80	6645.6 ppb	1.37	20.00	80 - 120	
78 Se	15.07	3728.8 ppb	1.26	20.00	80 - 120	Fail
88 Sr	12.70	618260.7 ppb	2.03	20.00	80 - 120	Fail
89 Y	--------	3739718.0 ppb	--------	20.00	80 - 120	
95 Mo	2231.00	10016860.0 ppb	0.34	2000.00	80 - 120	
107 Ag	20.94	195564.1 ppb	0.91	20.00	80 - 120	
111 Cd	20.23	44904.5 ppb	2.03	20.00	80 - 120	
118 Sn	19.52	118286.8 ppb	1.03	20.00	80 - 120	
121 Sb	19.99	147292.7 ppb	0.21	20.00	80 - 120	
137 Ba	21.38	57749.3 ppb	1.14	20.00	80 - 120	
205 Tl	20.86	186176.4 ppb	1.38	20.00	80 - 120	
208 Pb	21.06	250370.5 ppb	0.90	20.00	80 - 120	
235 U	0.05	476.7 ppb	7.95	0.14	80 - 120	Fail
238 U	21.62	206249.9 ppb	0.93	19.86	80 - 120	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	483886.7	1.54	516131.41	93.8	60 - 125	
45 Sc	690787.3	0.37	751121.75	92.0	60 - 125	
45 Sc	93249.7	0.65	105116.80	88.7	60 - 125	
45 Sc	2436974.8	2.20	2578760.50	94.5	60 - 125	
72 Ge	243961.6	0.06	182569.23	133.6	60 - 125	ISFail
72 Ge	82407.0	1.29	62725.95	131.4	60 - 125	ISFail
72 Ge	899009.4	3.05	550487.25	163.3	60 - 125	ISFail
115 In	2750997.8	0.42	3088381.00	89.1	60 - 125	
159 Tb	2857020.5	0.33	2902786.50	98.4	60 - 125	
209 Bi	1028423.0	0.54	1175901.50	87.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
3 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Fail
ISTD: Fail

7061

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30015.D\98L30015.D#
Date Acquired:	Dec 27 2006 01:47 pm
Operator:	JEE
Sample Name:	CCV1
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.11	284280.69 ppb	0.33	45.00	90 - 110	
9 Be	44.93	81862.62 ppb	0.10	45.00	90 - 110	
11 B	44.37	53405.43 ppb	0.85	45.00	90 - 110	
23 Na	4729.00	6802576.00 ppb	0.77	4500.00	90 - 110	
24 Mg	4751.00	36375380.00 ppb	0.94	4500.00	90 - 110	
27 Al	4735.00	49092920.00 ppb	0.64	4500.00	90 - 110	
39 K	4635.00	1147312.00 ppb	1.48	4500.00	90 - 110	
40 Ca	4696.00	16975310.00 ppb	0.47	4500.00	90 - 110	
47 Ti	44.87	66801.46 ppb	0.93	45.00	90 - 110	
51 V	44.59	108438.60 ppb	0.52	45.00	90 - 110	
52 Cr	45.19	130121.40 ppb	0.63	45.00	90 - 110	
55 Mn	45.23	1155043.00 ppb	0.36	45.00	90 - 110	
56 Fe	4678.00	23234170.00 ppb	0.30	4500.00	90 - 110	
59 Co	43.47	942095.13 ppb	0.81	45.00	90 - 110	
60 Ni	45.39	58051.06 ppb	0.50	45.00	90 - 110	
63 Cu	45.84	158021.59 ppb	0.52	45.00	90 - 110	
66 Zn	46.65	132206.59 ppb	0.98	45.00	90 - 110	
75 As	45.76	15813.17 ppb	1.03	45.00	90 - 110	
78 Se	46.44	7340.37 ppb	0.36	45.00	90 - 110	
88 Sr	46.72	1291435.00 ppb	0.16	45.00	90 - 110	
89 Y	--------	3525004.00 ppb	--------	---	90 - 110	
95 Mo	44.26	198040.00 ppb	0.95	45.00	90 - 110	
107 Ag	44.85	417173.09 ppb	1.38	45.00	90 - 110	
111 Cd	44.92	97255.77 ppb	1.17	45.00	90 - 110	
118 Sn	44.50	266583.91 ppb	0.69	45.00	90 - 110	
121 Sb	44.18	323782.81 ppb	1.46	45.00	90 - 110	
137 Ba	45.18	121471.60 ppb	0.99	45.00	90 - 110	
205 Tl	46.19	433467.59 ppb	2.06	45.00	90 - 110	
208 Pb	46.66	580667.38 ppb	2.02	45.00	90 - 110	
235 U	0.33	3511.81 ppb	4.70	0.32	90 - 110	
238 U	45.81	459565.19 ppb	2.53	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	481716.41	0.89	516131.41	93.3	60 - 125	
45 Sc	624782.75	0.45	751121.75	83.2	60 - 125	
45 Sc	96226.63	0.42	105116.80	91.5	60 - 125	
45 Sc	2381088.00	1.08	2578760.50	92.3	60 - 125	
72 Ge	156077.38	0.22	182569.23	85.5	60 - 125	
72 Ge	59174.59	0.18	62725.95	94.3	60 - 125	
72 Ge	512109.16	0.85	550487.25	93.0	60 - 125	
115 In	2740714.80	0.83	3088381.00	88.7	60 - 125	
159 Tb	2710827.30	0.21	2902786.50	93.4	60 - 125	
209 Bi	1081899.60	2.16	1175901.50	92.0	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30016.D\98L30016.D#
Date Acquired:	Dec 27 2006 01:55 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB1
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0897	34289.6 ppb	98.06	1.00	
9 Be	-0.0004	23.3 ppb	1046.90	1.00	
11 B	0.1184	3481.7 ppb	116.55	1.00	
23 Na	12.9000	243859.7 ppb	12.64	1.00	
24 Mg	0.5965	39121.5 ppb	5.80	1.00	
27 Al	0.0903	15639.9 ppb	21.29	1.00	
39 K	4.4250	17576.9 ppb	27.12	1.00	
40 Ca	-0.3709	28307.3 ppb	29.55	1.00	
47 Ti	0.0315	176.7 ppb	80.34	1.00	
51 V	0.0499	1166.7 ppb	25.98	1.00	
52 Cr	-0.0055	320.7 ppb	70.40	1.00	
55 Mn	-0.0014	1324.6 ppb	320.60	1.00	
56 Fe	-0.2608	9681.8 ppb	16.81	1.00	
59 Co	0.0014	157.8 ppb	40.25	1.00	
60 Ni	0.0008	42.7 ppb	1028.20	1.00	
63 Cu	-0.0303	290.2 ppb	7.32	1.00	
66 Zn	-0.0764	1395.7 ppb	21.74	1.00	
75 As	0.0057	29.6 ppb	81.36	1.00	
78 Se	0.0322	10.9 ppb	88.79	1.00	
88 Sr	-0.0030	1532.4 ppb	20.91	1.00	
89 Y	--------	3487775.0 ppb	--------	1.00	
95 Mo	0.0468	254.5 ppb	21.59	1.00	
107 Ag	0.0028	155.6 ppb	32.12	1.00	
111 Cd	0.0931	1871.2 ppb	20.13	1.00	
118 Sn	0.0426	1878.0 ppb	28.99	1.00	
121 Sb	0.1588	1550.2 ppb	14.52	1.00	
137 Ba	0.0003	84.4 ppb	839.74	1.00	
205 Tl	0.0570	642.3 ppb	7.50	1.00	
208 Pb	-0.0896	1079.0 ppb	4.97	1.00	
235 U	0.0002	11.1 ppb	301.52	1.00	
238 U	0.0074	118.9 ppb	23.87	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	483526.0	1.02	516131.41	93.7	60 - 125	
45 Sc	617835.6	0.49	751121.75	82.3	60 - 125	
45 Sc	94691.1	0.56	105116.80	90.1	60 - 125	
45 Sc	2344449.8	0.77	2578760.50	90.9	60 - 125	
72 Ge	152225.9	0.54	182569.23	83.4	60 - 125	
72 Ge	56813.9	0.69	62725.95	90.6	60 - 125	
72 Ge	483189.4	0.75	550487.25	87.8	60 - 125	
115 In	2734094.8	0.93	3088381.00	88.5	60 - 125	
159 Tb	2657976.3	0.50	2902786.50	91.6	60 - 125	
209 Bi	1105470.3	5.14	1175901.50	94.0	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

7863

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30027.D\98L30027.D#
Date Acquired:	Dec 27 2006 03:30 pm
Operator:	JEE
Sample Name:	CCV2
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.16	279894.50 ppb	0.22	45.00	90 - 110	
9 Be	45.25	81103.40 ppb	0.46	45.00	90 - 110	
11 B	47.43	55935.68 ppb	0.75	45.00	90 - 110	
23 Na	4819.00	6256992.00 ppb	0.56	4500.00	90 - 110	
24 Mg	4838.00	35901420.00 ppb	1.23	4500.00	90 - 110	
27 Al	4806.00	48291032.00 ppb	0.71	4500.00	90 - 110	
39 K	4615.00	1096107.00 ppb	0.51	4500.00	90 - 110	
40 Ca	4684.00	15295710.00 ppb	1.14	4500.00	90 - 110	
47 Ti	44.31	63938.10 ppb	1.06	45.00	90 - 110	
51 V	44.98	104954.20 ppb	0.52	45.00	90 - 110	
52 Cr	45.21	124905.10 ppb	0.56	45.00	90 - 110	
55 Mn	44.82	1109211.00 ppb	0.45	45.00	90 - 110	
56 Fe	4717.00	21159000.00 ppb	0.10	4500.00	90 - 110	
59 Co	43.09	905078.31 ppb	0.23	45.00	90 - 110	
60 Ni	45.98	56423.65 ppb	0.62	45.00	90 - 110	
63 Cu	46.33	153262.20 ppb	0.54	45.00	90 - 110	
66 Zn	46.65	128119.70 ppb	0.63	45.00	90 - 110	
75 As	46.21	15323.04 ppb	0.23	45.00	90 - 110	
78 Se	47.49	6870.30 ppb	0.56	45.00	90 - 110	
88 Sr	46.17	1226994.00 ppb	0.42	45.00	90 - 110	
89 Y	--------	3363082.00 ppb	--------	---	90 - 110	
95 Mo	44.53	188550.00 ppb	0.61	45.00	90 - 110	
107 Ag	45.80	403171.31 ppb	0.59	45.00	90 - 110	
111 Cd	45.93	94070.42 ppb	1.30	45.00	90 - 110	
118 Sn	44.79	253946.59 ppb	1.01	45.00	90 - 110	
121 Sb	45.03	312289.91 ppb	0.76	45.00	90 - 110	
137 Ba	46.32	117844.80 ppb	1.36	45.00	90 - 110	
205 Tl	46.63	429627.41 ppb	0.82	45.00	90 - 110	
208 Pb	47.32	578108.88 ppb	0.40	45.00	90 - 110	
235 U	0.34	3467.33 ppb	2.08	0.32	90 - 110	
238 U	46.67	459656.81 ppb	0.32	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	473856.09	1.23	516131.41	91.8	60 - 125	
45 Sc	564322.50	0.44	751121.75	75.1	60 - 125	
45 Sc	92336.36	0.43	105116.80	87.8	60 - 125	
45 Sc	2307754.30	0.59	2578760.50	89.5	60 - 125	
72 Ge	142855.44	0.47	182569.23	78.2	60 - 125	
72 Ge	56860.95	0.80	62725.95	90.6	60 - 125	
72 Ge	492365.41	0.39	550487.25	89.4	60 - 125	
115 In	2593610.30	0.64	3088381.00	84.0	60 - 125	
159 Tb	2667156.80	0.34	2902786.50	91.9	60 - 125	
209 Bi	1061774.50	0.46	1175901.50	90.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30028.D\98L30028.D#
Date Acquired:	Dec 27 2006 03:39 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB2
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.1104	33763.8 ppb	33.76	1.00	
9 Be	-0.0020	20.0 ppb	193.04	1.00	
11 B	1.7630	5243.5 ppb	4.99	1.00	
23 Na	25.1100	249789.6 ppb	4.36	1.00	
24 Mg	0.0396	34576.7 ppb	93.16	1.00	
27 Al	0.2851	17453.4 ppb	7.20	1.00	
39 K	6.0930	18274.6 ppb	11.02	1.00	
40 Ca	-0.0966	28063.4 ppb	248.24	1.00	
47 Ti	0.0183	155.6 ppb	27.27	1.00	
51 V	0.0760	1249.0 ppb	28.30	1.00	
52 Cr	-0.0211	281.1 ppb	38.03	1.00	
55 Mn	0.0128	1663.5 ppb	24.35	1.00	
56 Fe	-0.1396	9846.0 ppb	70.15	1.00	
59 Co	0.0015	157.8 ppb	43.45	1.00	
60 Ni	-0.0030	38.4 ppb	43.14	1.00	
63 Cu	-0.0100	364.9 ppb	38.18	1.00	
66 Zn	-0.0484	1457.9 ppb	30.76	1.00	
75 As	0.0384	41.3 ppb	31.97	1.00	
78 Se	0.0000	5.8 ppb	47069.00	1.00	
88 Sr	0.0016	1670.2 ppb	88.07	1.00	
89 Y	--------	3466871.0 ppb	--------	1.00	
95 Mo	0.0271	166.7 ppb	38.30	1.00	
107 Ag	0.0002	132.2 ppb	571.36	1.00	
111 Cd	0.1426	1982.0 ppb	27.01	1.00	
118 Sn	0.0321	1821.3 ppb	38.66	1.00	
121 Sb	0.1468	1465.7 ppb	15.01	1.00	
137 Ba	0.0027	91.1 ppb	262.04	1.00	
205 Tl	0.0511	602.3 ppb	7.81	1.00	
208 Pb	-0.1078	872.3 ppb	0.69	1.00	
235 U	-0.0004	5.6 ppb	124.19	1.00	
238 U	0.0085	132.2 ppb	36.89	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	474439.7	0.86	516131.41	91.9	60 - 125	
45 Sc	592095.1	0.64	751121.75	78.8	60 - 125	
45 Sc	96256.8	0.36	105116.80	91.6	60 - 125	
45 Sc	2321108.0	0.94	2578760.50	90.0	60 - 125	
72 Ge	148460.5	0.55	182569.23	81.3	60 - 125	
72 Ge	58383.9	1.25	62725.95	93.1	60 - 125	
72 Ge	488009.3	0.12	550487.25	88.7	60 - 125	
115 In	2741828.0	0.45	3088381.00	88.8	60 - 125	
159 Tb	2692334.0	0.82	2902786.50	92.7	60 - 125	
209 Bi	1136400.0	4.04	1175901.50	96.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

7065

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30039.D\98L30039.D#
Date Acquired:	Dec 27 2006 05:48 pm
Operator:	JEE
Sample Name:	CCV3
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS		Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.50	300772.69	ppb	1.13	45.00	90 - 110	
9 Be	42.95	83817.92	ppb	1.81	45.00	90 - 110	
11 B	45.43	58487.04	ppb	1.11	45.00	90 - 110	
23 Na	4842.00	6985434.00	ppb	0.56	4500.00	90 - 110	
24 Mg	4846.00	37498608.00	ppb	1.50	4500.00	90 - 110	
27 Al	4771.00	50001288.00	ppb	1.15	4500.00	90 - 110	
39 K	4588.00	1119117.00	ppb	2.12	4500.00	90 - 110	
40 Ca	4627.00	16789080.00	ppb	0.44	4500.00	90 - 110	
47 Ti	44.72	67308.61	ppb	0.42	45.00	90 - 110	
51 V	44.74	107207.00	ppb	0.87	45.00	90 - 110	
52 Cr	45.27	128412.40	ppb	0.77	45.00	90 - 110	
55 Mn	45.56	1175671.00	ppb	1.33	45.00	90 - 110	
56 Fe	4634.00	23098240.00	ppb	0.74	4500.00	90 - 110	
59 Co	43.22	946760.88	ppb	0.95	45.00	90 - 110	
60 Ni	46.03	58002.23	ppb	1.07	45.00	90 - 110	
63 Cu	46.17	156810.80	ppb	0.92	45.00	90 - 110	
66 Zn	46.51	133226.50	ppb	0.47	45.00	90 - 110	
75 As	45.07	15346.17	ppb	0.91	45.00	90 - 110	
78 Se	46.51	7221.87	ppb	1.74	45.00	90 - 110	
88 Sr	46.73	1295793.00	ppb	0.65	45.00	90 - 110	
89 Y	--------	3538685.00	ppb	--------	---	90 - 110	
95 Mo	43.99	199101.41	ppb	0.17	45.00	90 - 110	
107 Ag	45.28	426076.91	ppb	0.92	45.00	90 - 110	
111 Cd	44.82	98170.83	ppb	0.10	45.00	90 - 110	
118 Sn	44.71	270976.50	ppb	0.91	45.00	90 - 110	
121 Sb	44.59	330588.41	ppb	0.81	45.00	90 - 110	
137 Ba	45.89	124801.50	ppb	0.34	45.00	90 - 110	
205 Tl	45.71	440739.91	ppb	3.08	45.00	90 - 110	
208 Pb	46.38	593013.38	ppb	3.05	45.00	90 - 110	
235 U	0.31	3352.85	ppb	2.91	0.32	90 - 110	
238 U	44.53	459050.69	ppb	3.29	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	515920.16	0.74	516131.41	100.0	60 - 125	
45 Sc	627066.13	0.69	751121.75	83.5	60 - 125	
45 Sc	94815.56	0.76	105116.80	90.2	60 - 125	
45 Sc	2406780.80	1.28	2578760.50	93.3	60 - 125	
72 Ge	153308.81	0.39	182569.23	84.0	60 - 125	
72 Ge	56864.03	1.17	62725.95	90.7	60 - 125	
72 Ge	513808.47	0.73	550487.25	93.3	60 - 125	
115 In	2772420.50	0.57	3088381.00	89.8	60 - 125	
159 Tb	2766269.30	0.40	2902786.50	95.3	60 - 125	
209 Bi	1111999.60	3.24	1175901.50	94.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Pass**
ISTD: **Pass**

7066

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30040.D\98L30040.D#
Date Acquired:	Dec 27 2006 05:56 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB3
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0830	35676.7 ppb	31.66	1.00	
9 Be	0.0038	32.2 ppb	230.94	1.00	
11 B	1.6730	5461.4 ppb	12.71	1.00	
23 Na	40.4300	282933.2 ppb	2.06	1.00	
24 Mg	1.1760	43611.1 ppb	4.45	1.00	
27 Al	0.3749	18592.7 ppb	19.10	1.00	
39 K	5.0710	17820.7 ppb	25.95	1.00	
40 Ca	0.2727	30738.3 ppb	50.24	1.00	
47 Ti	-0.0026	126.7 ppb	686.06	1.00	
51 V	0.0159	1091.8 ppb	49.08	1.00	
52 Cr	-0.0214	277.3 ppb	13.58	1.00	
55 Mn	0.0003	1372.4 ppb	647.25	1.00	
56 Fe	-0.0440	10792.0 ppb	128.56	1.00	
59 Co	0.0030	193.3 ppb	40.07	1.00	
60 Ni	0.0045	47.6 ppb	172.06	1.00	
63 Cu	-0.0381	264.9 ppb	18.53	1.00	
66 Zn	-0.0629	1437.9 ppb	39.87	1.00	
75 As	0.0093	30.9 ppb	240.93	1.00	
78 Se	0.0023	6.2 ppb	214.81	1.00	
88 Sr	0.0024	1695.7 ppb	97.42	1.00	
89 Y	--------	3525365.0 ppb	--------	1.00	
95 Mo	0.0262	164.5 ppb	4.66	1.00	
107 Ag	0.0043	172.2 ppb	74.97	1.00	
111 Cd	-0.0093	1678.7 ppb	346.91	1.00	
118 Sn	0.0829	2149.2 ppb	29.74	1.00	
121 Sb	0.1861	1774.6 ppb	6.82	1.00	
137 Ba	-0.0010	82.2 ppb	190.03	1.00	
205 Tl	0.0687	751.2 ppb	7.88	1.00	
208 Pb	-0.0977	973.4 ppb	6.25	1.00	
235 U	-0.0007	2.2 ppb	26.82	1.00	
238 U	0.0097	140.0 ppb	40.46	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	503592.8	1.23	516131.41	97.6	60 - 125	
45 Sc	620509.9	0.18	751121.75	82.6	60 - 125	
45 Sc	95165.7	0.91	105116.80	90.5	60 - 125	
45 Sc	2351471.5	1.90	2578760.50	91.2	60 - 125	
72 Ge	150853.5	0.25	182569.23	82.6	60 - 125	
72 Ge	55918.8	0.90	62725.95	89.1	60 - 125	
72 Ge	489538.7	0.61	550487.25	88.9	60 - 125	
115 In	2773770.5	1.22	3088381.00	89.8	60 - 125	
159 Tb	2742685.3	0.76	2902786.50	94.5	60 - 125	
209 Bi	1100551.8	1.53	1175901.50	93.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed

0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass

ISTD: Pass

7067

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30051.D\98L30051.D#
Date Acquired:	Dec 27 2006 07:56 pm
Operator:	JEE
Sample Name:	CCV4
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.59	312721.41 ppb	0.30	45.00	90 - 110	
9 Be	42.99	87072.24 ppb	0.38	45.00	90 - 110	
11 B	43.88	58743.38 ppb	0.67	45.00	90 - 110	
23 Na	4951.00	6841213.00 ppb	0.89	4500.00	90 - 110	Fail
24 Mg	4931.00	38488280.00 ppb	0.18	4500.00	90 - 110	
27 Al	4870.00	51479320.00 ppb	0.68	4500.00	90 - 110	
39 K	4603.00	1108519.00 ppb	1.48	4500.00	90 - 110	
40 Ca	4656.00	16194310.00 ppb	0.39	4500.00	90 - 110	
47 Ti	44.47	67500.64 ppb	0.55	45.00	90 - 110	
51 V	44.88	106168.80 ppb	1.35	45.00	90 - 110	
52 Cr	45.38	127111.40 ppb	1.01	45.00	90 - 110	
55 Mn	44.93	1169723.00 ppb	1.30	45.00	90 - 110	
56 Fe	4624.00	22089330.00 ppb	0.50	4500.00	90 - 110	
59 Co	42.64	942083.31 ppb	0.66	45.00	90 - 110	
60 Ni	46.14	57416.05 ppb	1.10	45.00	90 - 110	
63 Cu	46.31	155305.00 ppb	1.06	45.00	90 - 110	
66 Zn	45.66	131960.59 ppb	0.73	45.00	90 - 110	
75 As	45.31	15232.48 ppb	1.76	45.00	90 - 110	
78 Se	46.36	7006.15 ppb	1.11	45.00	90 - 110	
88 Sr	45.78	1269922.00 ppb	0.75	45.00	90 - 110	
89 Y	--------	3480793.00 ppb	--------	---	90 - 110	
95 Mo	44.70	195711.41 ppb	0.15	45.00	90 - 110	
107 Ag	45.40	413230.81 ppb	0.27	45.00	90 - 110	
111 Cd	45.03	95388.90 ppb	0.51	45.00	90 - 110	
118 Sn	44.55	261166.41 ppb	0.29	45.00	90 - 110	
121 Sb	44.64	320116.91 ppb	0.33	45.00	90 - 110	
137 Ba	45.70	120232.30 ppb	1.04	45.00	90 - 110	
205 Tl	46.69	435485.50 ppb	0.38	45.00	90 - 110	
208 Pb	47.26	584493.88 ppb	0.17	45.00	90 - 110	
235 U	0.33	3488.45 ppb	0.93	0.32	90 - 110	
238 U	46.15	460169.41 ppb	0.86	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	535417.56	1.09	516131.41	103.7	60 - 125	
45 Sc	601027.81	0.44	751121.75	80.0	60 - 125	
45 Sc	93620.98	0.82	105116.80	89.1	60 - 125	
45 Sc	2427354.30	0.45	2578760.50	94.1	60 - 125	
72 Ge	149219.95	0.33	182569.23	81.7	60 - 125	
72 Ge	57229.95	0.85	62725.95	91.2	60 - 125	
72 Ge	513974.25	0.86	550487.25	93.4	60 - 125	
115 In	2681705.00	0.51	3088381.00	86.8	60 - 125	
159 Tb	2687331.80	0.88	2902786.50	92.6	60 - 125	
209 Bi	1074877.80	0.39	1175901.50	91.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

1 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Pass**

7668

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30052.D\98L30052.D#
Date Acquired:	Dec 27 2006 08:05 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB4
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0687	37170.7 ppb	29.25	1.00	
9 Be	0.0070	40.0 ppb	24.13	1.00	
11 B	1.2900	5230.1 ppb	10.94	1.00	
23 Na	28.5800	258988.2 ppb	6.78	1.00	
24 Mg	1.0780	43053.5 ppb	10.39	1.00	
27 Al	0.6814	21831.2 ppb	1.92	1.00	
39 K	1.3960	16464.3 ppb	138.47	1.00	
40 Ca	1.3900	33755.8 ppb	9.53	1.00	
47 Ti	0.0089	144.5 ppb	29.91	1.00	
51 V	0.0303	1094.9 ppb	26.92	1.00	
52 Cr	-0.0168	282.2 ppb	47.08	1.00	
55 Mn	0.0013	1402.4 ppb	122.45	1.00	
56 Fe	0.1418	11374.4 ppb	31.23	1.00	
59 Co	0.0045	225.6 ppb	19.94	1.00	
60 Ni	0.0025	43.8 ppb	153.76	1.00	
63 Cu	-0.0363	263.6 ppb	3.53	1.00	
66 Zn	-0.0579	1456.8 ppb	42.76	1.00	
75 As	0.0144	31.8 ppb	46.96	1.00	
78 Se	0.0112	7.3 ppb	104.93	1.00	
88 Sr	0.0119	1934.7 ppb	14.88	1.00	
89 Y	--------	3448097.0 ppb	--------	1.00	
95 Mo	0.0238	148.9 ppb	3.70	1.00	
107 Ag	0.0016	142.2 ppb	125.39	1.00	
111 Cd	-0.0222	1598.3 ppb	109.33	1.00	
118 Sn	0.0471	1871.3 ppb	50.76	1.00	
121 Sb	0.1751	1639.1 ppb	11.45	1.00	
137 Ba	0.0051	95.6 ppb	125.55	1.00	
205 Tl	0.0999	1043.4 ppb	2.13	1.00	
208 Pb	-0.1076	842.3 ppb	3.80	1.00	
235 U	-0.0001	7.8 ppb	360.98	1.00	
238 U	0.0126	170.0 ppb	19.43	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	525947.1	0.95	516131.41	101.9	60 - 125	
45 Sc	602870.4	0.58	751121.75	80.3	60 - 125	
45 Sc	92529.0	0.91	105116.80	88.0	60 - 125	
45 Sc	2361439.8	1.31	2578760.50	91.6	60 - 125	
72 Ge	146008.8	0.58	182569.23	80.0	60 - 125	
72 Ge	56018.1	0.61	62725.95	89.3	60 - 125	
72 Ge	486414.5	1.00	550487.25	88.4	60 - 125	
115 In	2686225.5	0.59	3088381.00	87.0	60 - 125	
159 Tb	2661066.0	0.48	2902786.50	91.7	60 - 125	
209 Bi	1094366.8	3.32	1175901.50	93.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30063.D\98L30063.D#
Date Acquired:	Dec 27 2006 09:40 pm
Operator:	JEE
Sample Name:	CCV5
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	42.42	328798.81 ppb	1.87	45.00	90 - 110	
9 Be	41.28	90046.68 ppb	1.86	45.00	90 - 110	
11 B	41.09	59509.26 ppb	1.11	45.00	90 - 110	
23 Na	5062.00	7232864.00 ppb	0.31	4500.00	90 - 110	Fail
24 Mg	5037.00	39461568.00 ppb	1.05	4500.00	90 - 110	Fail
27 Al	4908.00	52074752.00 ppb	0.45	4500.00	90 - 110	
39 K	4593.00	1082138.00 ppb	1.82	4500.00	90 - 110	
40 Ca	4661.00	16773060.00 ppb	0.40	4500.00	90 - 110	
47 Ti	44.75	68186.42 ppb	0.96	45.00	90 - 110	
51 V	45.17	104554.60 ppb	0.72	45.00	90 - 110	
52 Cr	45.96	125938.90 ppb	0.64	45.00	90 - 110	
55 Mn	44.98	1175309.00 ppb	0.33	45.00	90 - 110	
56 Fe	4543.00	22459270.00 ppb	0.10	4500.00	90 - 110	
59 Co	42.58	944520.81 ppb	0.32	45.00	90 - 110	
60 Ni	46.70	56856.69 ppb	0.37	45.00	90 - 110	
63 Cu	46.72	153296.50 ppb	0.74	45.00	90 - 110	
66 Zn	45.82	132913.09 ppb	0.41	45.00	90 - 110	
75 As	44.24	14553.89 ppb	0.61	45.00	90 - 110	
78 Se	46.93	6945.89 ppb	0.79	45.00	90 - 110	
88 Sr	45.35	1262143.00 ppb	0.46	45.00	90 - 110	
89 Y	--------	3479800.00 ppb	--------	---	90 - 110	
95 Mo	44.96	194283.80 ppb	0.30	45.00	90 - 110	
107 Ag	45.57	409426.91 ppb	0.86	45.00	90 - 110	
111 Cd	44.98	94060.06 ppb	1.43	45.00	90 - 110	
118 Sn	43.89	253988.59 ppb	1.19	45.00	90 - 110	
121 Sb	44.09	312123.31 ppb	0.69	45.00	90 - 110	
137 Ba	44.70	116070.70 ppb	0.52	45.00	90 - 110	
205 Tl	46.34	421500.31 ppb	0.19	45.00	90 - 110	
208 Pb	47.18	569091.31 ppb	0.54	45.00	90 - 110	
235 U	0.33	3320.62 ppb	3.85	0.32	90 - 110	
238 U	46.35	450731.19 ppb	0.57	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	576785.56	2.67	516131.41	111.8	60 - 125	
45 Sc	621945.25	0.39	751121.75	82.8	60 - 125	
45 Sc	91594.48	0.81	105116.80	87.1	60 - 125	
45 Sc	2436606.00	0.68	2578760.50	94.5	60 - 125	
72 Ge	146141.59	0.83	182569.23	80.0	60 - 125	
72 Ge	55268.24	0.12	62725.95	88.1	60 - 125	
72 Ge	515565.63	0.73	550487.25	93.7	60 - 125	
115 In	2647049.30	0.48	3088381.00	85.7	60 - 125	
159 Tb	2594159.30	0.87	2902786.50	89.4	60 - 125	
209 Bi	1048306.30	0.37	1175901.50	89.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

2 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Pass**

7070

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30064.D\98L30064.D#
Date Acquired:	Dec 27 2006 09:49 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB5
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	-0.0445	39901.1 ppb	91.70	1.00	
9 Be	-0.0014	25.6 ppb	59.89	1.00	
11 B	0.6270	4828.8 ppb	24.42	1.00	
23 Na	22.1900	253999.0 ppb	2.17	1.00	
24 Mg	1.0880	43811.7 ppb	1.02	1.00	
27 Al	0.9010	24466.9 ppb	3.32	1.00	
39 K	0.3078	15963.7 ppb	225.02	1.00	
40 Ca	1.6710	35229.7 ppb	2.53	1.00	
47 Ti	-0.0008	132.2 ppb	570.15	1.00	
51 V	0.0250	1066.1 ppb	59.25	1.00	
52 Cr	-0.0191	271.6 ppb	11.09	1.00	
55 Mn	0.0018	1437.9 ppb	63.51	1.00	
56 Fe	0.2401	12015.0 ppb	11.64	1.00	
59 Co	0.0034	205.6 ppb	53.74	1.00	
60 Ni	0.0022	42.7 ppb	110.51	1.00	
63 Cu	-0.0257	294.0 ppb	9.54	1.00	
66 Zn	-0.0675	1452.4 ppb	53.48	1.00	
75 As	0.0023	27.3 ppb	672.86	1.00	
78 Se	0.0019	5.8 ppb	775.84	1.00	
88 Sr	0.0084	1850.2 ppb	58.02	1.00	
89 Y	--------	3430118.0 ppb	--------	1.00	
95 Mo	0.0287	166.7 ppb	19.68	1.00	
107 Ag	0.0049	167.8 ppb	70.60	1.00	
111 Cd	-0.0600	1484.7 ppb	88.91	1.00	
118 Sn	0.0385	1779.1 ppb	21.62	1.00	
121 Sb	0.1621	1510.2 ppb	5.80	1.00	
137 Ba	-0.0010	77.8 ppb	168.69	1.00	
205 Tl	0.0789	807.8 ppb	4.59	1.00	
208 Pb	-0.1059	827.8 ppb	1.37	1.00	
235 U	0.0000	8.9 ppb	5489.00	1.00	
238 U	0.0137	173.3 ppb	23.52	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	575432.1	0.72	516131.41	111.5	60 - 125	
45 Sc	611470.8	0.22	751121.75	81.4	60 - 125	
45 Sc	91120.4	0.41	105116.80	86.7	60 - 125	
45 Sc	2398565.5	1.09	2578760.50	93.0	60 - 125	
72 Ge	141461.5	0.81	182569.23	77.5	60 - 125	
72 Ge	53473.9	0.68	62725.95	85.2	60 - 125	
72 Ge	488745.7	0.98	550487.25	88.8	60 - 125	
115 In	2623279.8	1.32	3088381.00	84.9	60 - 125	
159 Tb	2542081.5	0.41	2902786.50	87.6	60 - 125	
209 Bi	1047058.0	0.89	1175901.50	89.0	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

TGT1

ICS-A QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30065.D\98L30065.D#
Date Acquired:	Dec 27 2006 09:57 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSA2
Misc Info:	
Vial Number:	1201
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-A
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.09	37136.1 ppb	44.43	---	
9 Be	0.01	47.8 ppb	78.15	---	
11 B	1.89	5933.8 ppb	8.60	---	
23 Na	103900.00	146064300.0 ppb	0.38	---	
24 Mg	103500.00	785754820.0 ppb	0.07	---	
27 Al	103100.00	1060384000.0 ppb	0.26	---	
39 K	93260.00	20489380.0 ppb	0.75	---	
40 Ca	98370.00	358507100.0 ppb	0.58	---	
47 Ti	2212.00	3262260.0 ppb	0.59	---	
51 V	0.40	1827.0 ppb	2.35	---	
52 Cr	0.67	2026.6 ppb	2.70	---	
55 Mn	3.08	79215.0 ppb	1.40	---	
56 Fe	96030.00	481342110.0 ppb	0.26	---	
59 Co	0.65	14115.0 ppb	0.68	---	
60 Ni	0.94	1114.5 ppb	5.00	---	
63 Cu	1.99	6511.2 ppb	1.56	---	
66 Zn	5.64	17292.3 ppb	1.09	---	
75 As	0.24	98.2 ppb	7.69	---	
78 Se	0.04	17.1 ppb	103.61	---	
88 Sr	1.95	91851.5 ppb	3.24	---	
89 Y	--------	3458486.0 ppb	--------	---	
95 Mo	2310.00	9341781.0 ppb	0.76	---	
107 Ag	0.06	628.9 ppb	17.50	---	
111 Cd	1.02	3481.2 ppb	42.04	---	
118 Sn	0.13	2170.3 ppb	8.40	---	
121 Sb	0.14	1275.7 ppb	7.11	---	
137 Ba	0.81	2034.7 ppb	5.68	---	
205 Tl	0.07	643.4 ppb	1.24	---	
208 Pb	0.38	6276.5 ppb	3.66	---	
235 U	0.00	10.0 ppb	540.06	---	
238 U	0.01	117.8 ppb	13.96	---	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	523489.3	1.55	516131.41	101.4	60 - 125	
45 Sc	630888.3	0.44	751121.75	84.0	60 - 125	
45 Sc	86613.0	0.49	105116.80	82.4	60 - 125	
45 Sc	2363485.5	1.76	2578760.50	91.7	60 - 125	
72 Ge	216067.7	0.85	182569.23	118.3	60 - 125	
72 Ge	75701.3	0.33	62725.95	120.7	60 - 125	
72 Ge	848398.8	3.50	550487.25	154.1	60 - 125	ISFail
115 In	2477473.0	1.01	3088381.00	80.2	60 - 125	
159 Tb	2616748.0	0.53	2902786.50	90.1	60 - 125	
209 Bi	979144.3	0.84	1175901.50	83.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
1 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7872

ICS-AB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30066.D\98L30066.D#
Date Acquired:	Dec 27 2006 10:06 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSAB2
Misc Info:	
Vial Number:	1202
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-AB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	18.31	139441.4 ppb	0.33	20.00	80 - 120	
9 Be	16.82	31040.5 ppb	1.66	20.00	80 - 120	
11 B	20.17	26423.8 ppb	1.28	20.00	80 - 120	
23 Na	100900.00	133000700.0 ppb	0.34	100000.00	80 - 120	
24 Mg	102600.00	750718910.0 ppb	0.66	100000.00	80 - 120	
27 Al	102700.00	1017577000.0 ppb	0.38	100000.00	80 - 120	
39 K	93030.00	19565040.0 ppb	0.80	100000.00	80 - 120	
40 Ca	96690.00	330396990.0 ppb	0.22	100000.00	80 - 120	
47 Ti	2185.00	3105576.0 ppb	0.71	2000.00	80 - 120	
51 V	20.30	43030.8 ppb	1.45	20.00	80 - 120	
52 Cr	20.51	51036.1 ppb	0.98	20.00	80 - 120	
55 Mn	21.29	520614.7 ppb	0.95	20.00	80 - 120	
56 Fe	95390.00	448287010.0 ppb	0.17	100000.00	80 - 120	
59 Co	18.00	373165.3 ppb	0.20	20.00	80 - 120	
60 Ni	19.65	21670.2 ppb	1.54	20.00	80 - 120	
63 Cu	20.59	61354.0 ppb	1.97	20.00	80 - 120	
66 Zn	22.32	61289.1 ppb	1.52	20.00	80 - 120	
75 As	19.44	5800.9 ppb	3.31	20.00	80 - 120	
78 Se	14.58	3018.6 ppb	0.23	20.00	80 - 120	Fail
88 Sr	12.17	545518.3 ppb	2.33	20.00	80 - 120	Fail
89 Y	--------	3335781.0 ppb	--------	20.00	80 - 120	
95 Mo	2262.00	8898913.0 ppb	0.41	2000.00	80 - 120	
107 Ag	21.21	173553.8 ppb	0.38	20.00	80 - 120	
111 Cd	20.16	39201.6 ppb	3.55	20.00	80 - 120	
118 Sn	19.38	102898.7 ppb	0.27	20.00	80 - 120	
121 Sb	19.89	128386.1 ppb	1.06	20.00	80 - 120	
137 Ba	21.16	50069.5 ppb	1.04	20.00	80 - 120	
205 Tl	20.74	170650.8 ppb	1.27	20.00	80 - 120	
208 Pb	21.19	232111.9 ppb	0.58	20.00	80 - 120	
235 U	0.05	426.7 ppb	8.39	0.14	80 - 120	Fail
238 U	21.69	190734.0 ppb	0.75	19.86	80 - 120	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	487806.5	1.76	516131.41	94.5	60 - 125	
45 Sc	591531.6	0.17	751121.75	78.8	60 - 125	
45 Sc	82919.4	1.19	105116.80	78.9	60 - 125	
45 Sc	2277173.3	1.96	2578760.50	88.3	60 - 125	
72 Ge	204111.8	0.44	182569.23	111.8	60 - 125	
72 Ge	73482.6	0.94	62725.95	117.1	60 - 125	
72 Ge	827853.0	3.04	550487.25	150.4	60 - 125	ISFail
115 In	2409982.8	0.87	3088381.00	78.0	60 - 125	
159 Tb	2538781.8	0.41	2902786.50	87.5	60 - 125	
209 Bi	947788.8	0.47	1175901.50	80.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
1 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Fail
ISTD: Fail

7073

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30069.D\98L30069.D#
Date Acquired:	Dec 27 2006 10:32 pm
Operator:	JEE
Sample Name:	CCV6
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS		Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.72	288423.69	ppb	0.31	45.00	90 - 110	
9 Be	43.34	80765.02	ppb	1.20	45.00	90 - 110	
11 B	43.67	53802.50	ppb	0.52	45.00	90 - 110	
23 Na	4985.00	6143748.00	ppb	0.55	4500.00	90 - 110	Fail
24 Mg	4972.00	36112008.00	ppb	1.14	4500.00	90 - 110	Fail
27 Al	4900.00	48195080.00	ppb	0.97	4500.00	90 - 110	
39 K	4635.00	1028119.00	ppb	0.83	4500.00	90 - 110	
40 Ca	4691.00	14556500.00	ppb	0.49	4500.00	90 - 110	
47 Ti	44.23	62469.04	ppb	0.90	45.00	90 - 110	
51 V	44.94	97927.72	ppb	0.74	45.00	90 - 110	
52 Cr	45.49	117359.50	ppb	0.53	45.00	90 - 110	
55 Mn	44.33	1073827.00	ppb	0.22	45.00	90 - 110	
56 Fe	4620.00	19692930.00	ppb	0.40	4500.00	90 - 110	
59 Co	41.91	861764.38	ppb	0.23	45.00	90 - 110	
60 Ni	46.23	52988.13	ppb	0.90	45.00	90 - 110	
63 Cu	46.53	143730.20	ppb	0.57	45.00	90 - 110	
66 Zn	44.98	120987.60	ppb	0.26	45.00	90 - 110	
75 As	44.81	13878.03	ppb	0.20	45.00	90 - 110	
78 Se	46.31	6320.86	ppb	0.89	45.00	90 - 110	
88 Sr	45.32	1142411.00	ppb	0.18	45.00	90 - 110	
89 Y	--------	3158619.00	ppb	--------	---	90 - 110	
95 Mo	44.48	175670.41	ppb	0.87	45.00	90 - 110	
107 Ag	45.18	370991.41	ppb	0.74	45.00	90 - 110	
111 Cd	44.57	85211.03	ppb	1.25	45.00	90 - 110	
118 Sn	44.05	232965.30	ppb	0.63	45.00	90 - 110	
121 Sb	44.02	284807.41	ppb	1.30	45.00	90 - 110	
137 Ba	45.34	107594.30	ppb	0.73	45.00	90 - 110	
205 Tl	45.97	396304.19	ppb	0.22	45.00	90 - 110	
208 Pb	46.96	536878.00	ppb	0.34	45.00	90 - 110	
235 U	0.34	3243.94	ppb	4.68	0.32	90 - 110	
238 U	46.40	427620.00	ppb	0.75	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	492584.38	1.04	516131.41	95.4	60 - 125	
45 Sc	536233.75	0.31	751121.75	71.4	60 - 125	
45 Sc	86231.56	0.37	105116.80	82.0	60 - 125	
45 Sc	2258772.50	0.90	2578760.50	87.6	60 - 125	
72 Ge	134755.23	0.87	182569.23	73.8	60 - 125	
72 Ge	52825.48	0.36	62725.95	84.2	60 - 125	
72 Ge	467016.41	0.95	550487.25	84.8	60 - 125	
115 In	2419377.00	0.83	3088381.00	78.3	60 - 125	
159 Tb	2435268.00	0.49	2902786.50	83.9	60 - 125	
209 Bi	993542.19	0.43	1175901.50	84.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

2 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Pass**

7874

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30070.D\98L30070.D#
Date Acquired:	Dec 27 2006 10:40 pm
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB6
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0267	34873.4 ppb	284.03	1.00	
9 Be	0.0082	40.0 ppb	116.02	1.00	
11 B	0.2924	3779.6 ppb	15.79	1.00	
23 Na	33.1500	222627.0 ppb	4.20	1.00	
24 Mg	2.1710	47245.8 ppb	3.25	1.00	
27 Al	1.2860	25804.0 ppb	0.41	1.00	
39 K	3.8900	15470.9 ppb	43.32	1.00	
40 Ca	1.9930	30105.8 ppb	7.31	1.00	
47 Ti	0.0075	131.1 ppb	238.90	1.00	
51 V	0.0480	1030.7 ppb	19.53	1.00	
52 Cr	-0.0170	255.6 ppb	29.83	1.00	
55 Mn	0.0068	1419.0 ppb	48.19	1.00	
56 Fe	0.7283	11910.4 ppb	7.73	1.00	
59 Co	0.0061	238.9 ppb	35.66	1.00	
60 Ni	0.0022	39.3 ppb	168.72	1.00	
63 Cu	-0.0012	344.7 ppb	94.46	1.00	
66 Zn	-0.0773	1291.2 ppb	78.58	1.00	
75 As	0.0331	34.4 ppb	34.94	1.00	
78 Se	0.0010	4.9 ppb	859.32	1.00	
88 Sr	0.0135	1765.8 ppb	23.55	1.00	
89 Y	--------	3049743.0 ppb	--------	1.00	
95 Mo	0.0478	222.2 ppb	12.07	1.00	
107 Ag	0.0084	178.9 ppb	53.49	1.00	
111 Cd	-0.0845	1285.9 ppb	52.96	1.00	
118 Sn	0.0428	1616.8 ppb	21.15	1.00	
121 Sb	0.1437	1237.9 ppb	18.26	1.00	
137 Ba	0.0015	75.6 ppb	770.17	1.00	
205 Tl	0.0758	728.9 ppb	17.62	1.00	
208 Pb	-0.1087	742.3 ppb	0.93	1.00	
235 U	0.0002	10.0 ppb	201.73	1.00	
238 U	0.0137	161.1 ppb	15.89	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	496914.4	0.99	516131.41	96.3	60 - 125	
45 Sc	506236.9	0.64	751121.75	67.4	60 - 125	
45 Sc	83964.7	0.66	105116.80	79.9	60 - 125	
45 Sc	2172874.8	1.14	2578760.50	84.3	60 - 125	
72 Ge	122635.0	0.39	182569.23	67.2	60 - 125	
72 Ge	49443.3	1.05	62725.95	78.8	60 - 125	
72 Ge	434773.6	1.08	550487.25	79.0	60 - 125	
115 In	2352330.0	0.36	3088381.00	76.2	60 - 125	
159 Tb	2334085.5	0.90	2902786.50	80.4	60 - 125	
209 Bi	978693.2	0.11	1175901.50	83.2	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

T875

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30080.D\98L30080.D#
Date Acquired:	Dec 28 2006 12:07 am
Operator:	JEE
Sample Name:	CCV7
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.91	278773.69 ppb	0.16	45.00	90 - 110	
9 Be	43.08	77283.08 ppb	0.23	45.00	90 - 110	
11 B	46.85	55330.83 ppb	1.05	45.00	90 - 110	
23 Na	5133.00	5638709.00 ppb	0.35	4500.00	90 - 110	Fail
24 Mg	5031.00	34745260.00 ppb	1.09	4500.00	90 - 110	Fail
27 Al	4964.00	46429192.00 ppb	1.37	4500.00	90 - 110	Fail
39 K	4596.00	977550.69 ppb	0.49	4500.00	90 - 110	
40 Ca	4699.00	13005690.00 ppb	1.56	4500.00	90 - 110	
47 Ti	44.27	59465.85 ppb	0.95	45.00	90 - 110	
51 V	44.58	93147.63 ppb	0.23	45.00	90 - 110	
52 Cr	44.96	111209.20 ppb	0.24	45.00	90 - 110	
55 Mn	43.47	1001509.00 ppb	2.98	45.00	90 - 110	
56 Fe	4584.00	17427600.00 ppb	0.16	4500.00	90 - 110	
59 Co	41.48	811001.50 ppb	0.79	45.00	90 - 110	
60 Ni	45.34	49818.50 ppb	0.48	45.00	90 - 110	
63 Cu	45.52	134816.09 ppb	0.06	45.00	90 - 110	
66 Zn	44.47	113747.00 ppb	0.59	45.00	90 - 110	
75 As	44.24	13134.15 ppb	1.17	45.00	90 - 110	
78 Se	46.81	5565.37 ppb	1.01	45.00	90 - 110	
88 Sr	43.68	1043017.00 ppb	1.24	45.00	90 - 110	
89 Y	--------	2968037.00 ppb	--------	---	90 - 110	
95 Mo	44.52	163115.09 ppb	0.13	45.00	90 - 110	
107 Ag	45.46	346338.00 ppb	0.71	45.00	90 - 110	
111 Cd	44.81	79455.31 ppb	0.19	45.00	90 - 110	
118 Sn	44.37	217686.00 ppb	0.24	45.00	90 - 110	
121 Sb	44.08	264561.19 ppb	0.63	45.00	90 - 110	
137 Ba	46.08	101444.20 ppb	0.60	45.00	90 - 110	
205 Tl	45.99	384186.00 ppb	0.71	45.00	90 - 110	
208 Pb	46.91	519560.50 ppb	0.21	45.00	90 - 110	
235 U	0.34	3133.90 ppb	0.87	0.32	90 - 110	
238 U	47.00	419724.00 ppb	0.08	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	474240.56	1.51	516131.41	91.9	60 - 125	
45 Sc	478335.97	0.31	751121.75	63.7	60 - 125	
45 Sc	82667.48	0.26	105116.80	78.6	60 - 125	
45 Sc	2148051.30	0.95	2578760.50	83.3	60 - 125	
72 Ge	117392.23	0.99	182569.23	64.3	60 - 125	
72 Ge	49561.52	0.65	62725.95	79.0	60 - 125	
72 Ge	442329.25	0.95	550487.25	80.4	60 - 125	
115 In	2244363.50	0.30	3088381.00	72.7	60 - 125	
159 Tb	2303651.00	0.90	2902786.50	79.4	60 - 125	
209 Bi	962647.06	0.09	1175901.50	81.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
0 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Pass**

7976

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30081.D\98L30081.D#
Date Acquired:	Dec 28 2006 12:15 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB7
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.1580	33855.2 ppb	33.38	1.00	
9 Be	0.0125	45.6 ppb	114.61	1.00	
11 B	3.2590	6869.8 ppb	5.54	1.00	
23 Na	48.6400	228188.3 ppb	3.05	1.00	
24 Mg	1.6450	42404.7 ppb	3.57	1.00	
27 Al	1.4440	26565.5 ppb	0.24	1.00	
39 K	7.9320	16273.0 ppb	12.70	1.00	
40 Ca	2.1800	29136.9 ppb	8.68	1.00	
47 Ti	0.0129	134.5 ppb	108.21	1.00	
51 V	0.0738	1080.9 ppb	17.93	1.00	
52 Cr	-0.0122	266.7 ppb	39.38	1.00	
55 Mn	0.0059	1360.1 ppb	69.52	1.00	
56 Fe	0.8594	11822.6 ppb	1.07	1.00	
59 Co	0.0066	242.2 ppb	23.36	1.00	
60 Ni	0.0071	44.7 ppb	7.62	1.00	
63 Cu	-0.0157	300.0 ppb	3.19	1.00	
66 Zn	-0.0458	1334.6 ppb	30.16	1.00	
75 As	0.0312	33.8 ppb	57.84	1.00	
78 Se	0.0140	6.2 ppb	117.49	1.00	
88 Sr	0.0162	1766.9 ppb	28.20	1.00	
89 Y	--------	2984722.0 ppb	--------	1.00	
95 Mo	0.0493	222.2 ppb	12.31	1.00	
107 Ag	0.1654	1393.5 ppb	2.43	1.00	
111 Cd	-0.0540	1305.8 ppb	46.84	1.00	
118 Sn	0.1522	2118.1 ppb	9.47	1.00	
121 Sb	0.2148	1640.2 ppb	7.56	1.00	
137 Ba	0.0069	85.6 ppb	90.21	1.00	
205 Tl	0.0893	827.8 ppb	12.90	1.00	
208 Pb	-0.0848	992.3 ppb	3.75	1.00	
235 U	0.0004	12.2 ppb	95.22	1.00	
238 U	0.0206	220.0 ppb	19.22	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	471979.7	0.80	516131.41	91.4	60 - 125	
45 Sc	481190.7	0.43	751121.75	64.1	60 - 125	
45 Sc	83660.6	0.27	105116.80	79.6	60 - 125	
45 Sc	2114567.5	1.47	2578760.50	82.0	60 - 125	
72 Ge	117363.5	0.60	182569.23	64.3	60 - 125	
72 Ge	48863.1	0.50	62725.95	77.9	60 - 125	
72 Ge	419847.1	0.69	550487.25	76.3	60 - 125	
115 In	2289809.8	0.33	3088381.00	74.1	60 - 125	
159 Tb	2290841.5	0.77	2902786.50	78.9	60 - 125	
209 Bi	960621.3	0.13	1175901.50	81.7	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
0 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Pass

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30091.D\98L30091.D#
Date Acquired:	Dec 28 2006 01:42 am
Operator:	JEE
Sample Name:	CCV8
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.04	257423.80 ppb	0.36	45.00	90 - 110	
9 Be	43.01	71067.39 ppb	0.14	45.00	90 - 110	
11 B	47.20	51323.77 ppb	0.39	45.00	90 - 110	
23 Na	5144.00	5079773.00 ppb	0.85	4500.00	90 - 110	Fail
24 Mg	4925.00	32408330.00 ppb	0.30	4500.00	90 - 110	
27 Al	4881.00	43501632.00 ppb	0.56	4500.00	90 - 110	
39 K	4535.00	914550.19 ppb	0.34	4500.00	90 - 110	
40 Ca	4706.00	11711290.00 ppb	0.17	4500.00	90 - 110	
47 Ti	43.69	55917.91 ppb	0.53	45.00	90 - 110	
51 V	44.14	87436.38 ppb	0.33	45.00	90 - 110	
52 Cr	44.57	104505.10 ppb	0.43	45.00	90 - 110	
55 Mn	41.64	914030.38 ppb	0.06	45.00	90 - 110	
56 Fe	4602.00	15730460.00 ppb	1.10	4500.00	90 - 110	
59 Co	40.90	761961.31 ppb	0.36	45.00	90 - 110	
60 Ni	44.87	46738.64 ppb	1.04	45.00	90 - 110	
63 Cu	45.17	126817.00 ppb	0.41	45.00	90 - 110	
66 Zn	43.39	105786.00 ppb	1.08	45.00	90 - 110	
75 As	44.34	12478.83 ppb	0.82	45.00	90 - 110	
78 Se	46.27	4975.33 ppb	1.01	45.00	90 - 110	
88 Sr	41.79	927293.31 ppb	0.07	45.00	90 - 110	
89 Y	--------	2800704.00 ppb	--------	---	90 - 110	
95 Mo	44.01	152681.30 ppb	0.42	45.00	90 - 110	
107 Ag	44.67	322185.19 ppb	0.46	45.00	90 - 110	
111 Cd	43.76	73493.67 ppb	0.54	45.00	90 - 110	
118 Sn	43.84	203649.20 ppb	0.43	45.00	90 - 110	
121 Sb	43.54	247429.91 ppb	0.13	45.00	90 - 110	
137 Ba	45.45	94746.81 ppb	0.57	45.00	90 - 110	
205 Tl	45.97	362511.81 ppb	0.67	45.00	90 - 110	
208 Pb	46.79	489223.00 ppb	1.05	45.00	90 - 110	
235 U	0.35	3079.44 ppb	1.50	0.32	90 - 110	Fail
238 U	46.90	395326.41 ppb	0.65	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	436825.34	0.72	516131.41	84.6	60 - 125	
45 Sc	430041.47	0.73	751121.75	57.3	60 - 125	ISFail
45 Sc	78370.00	0.08	105116.80	74.6	60 - 125	
45 Sc	2046716.40	0.13	2578760.50	79.4	60 - 125	
72 Ge	106178.88	0.45	182569.23	58.2	60 - 125	ISFail
72 Ge	46424.36	0.78	62725.95	74.0	60 - 125	
72 Ge	411079.44	0.49	550487.25	74.7	60 - 125	
115 In	2124976.00	0.54	3088381.00	68.8	60 - 125	
159 Tb	2157759.80	1.34	2902786.50	74.3	60 - 125	
209 Bi	908758.31	0.79	1175901.50	77.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

2 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

7876

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30092.D\98L30092.D#
Date Acquired:	Dec 28 2006 01:51 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB8
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	1.9370	48277.8 ppb	87.56	1.00	
9 Be	1.1000	2371.7 ppb	96.73	1.00	
11 B	9.2630	15306.0 ppb	60.63	1.00	
23 Na	64.9500	221920.0 ppb	0.82	1.00	
24 Mg	1306.0000	10806250.0 ppb	93.65	1.00	
27 Al	603.4000	6766686.0 ppb	95.01	1.00	
39 K	9.3750	15310.7 ppb	33.82	1.00	
40 Ca	5.2350	33991.0 ppb	3.93	1.00	
47 Ti	20.8700	33726.0 ppb	98.37	1.00	
51 V	0.0623	976.3 ppb	36.11	1.00	
52 Cr	-0.0073	257.6 ppb	33.72	1.00	
55 Mn	6.7500	188076.8 ppb	99.57	1.00	
56 Fe	1.2130	11902.7 ppb	3.31	1.00	
59 Co	1.2300	28940.6 ppb	96.10	1.00	
60 Ni	0.0087	42.9 ppb	58.42	1.00	
63 Cu	-0.0282	242.4 ppb	10.31	1.00	
66 Zn	18.1500	56482.8 ppb	95.76	1.00	
75 As	0.0214	28.4 ppb	76.42	1.00	
78 Se	0.0090	5.1 ppb	208.71	1.00	
88 Sr	47.4000	1030035.0 ppb	109.20	1.00	
89 Y	--------	3297750.0 ppb	--------	1.00	
95 Mo	7.8820	34453.9 ppb	98.83	1.00	
107 Ag	0.9004	8235.6 ppb	91.65	1.00	
111 Cd	1.1850	3947.0 ppb	95.61	1.00	
118 Sn	1.3900	9507.8 ppb	95.68	1.00	
121 Sb	0.9672	7135.2 ppb	79.00	1.00	
137 Ba	6.2650	16490.0 ppb	97.94	1.00	
205 Tl	1.0080	10452.8 ppb	87.14	1.00	
208 Pb	29.1000	403510.1 ppb	104.19	1.00	
235 U	0.0070	91.1 ppb	105.07	1.00	
238 U	1.5160	16837.3 ppb	95.71	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	508246.4	17.10	516131.41	98.5	60 - 125	
45 Sc	434690.8	0.30	751121.75	57.9	60 - 125	ISFail
45 Sc	77273.3	0.89	105116.80	73.5	60 - 125	
45 Sc	2331367.8	16.24	2578760.50	90.4	60 - 125	
72 Ge	106355.7	0.26	182569.23	58.3	60 - 125	ISFail
72 Ge	45729.4	1.19	62725.95	72.9	60 - 125	
72 Ge	394153.5	2.96	550487.25	71.6	60 - 125	
115 In	2440172.8	14.60	3088381.00	79.0	60 - 125	
159 Tb	2563440.0	19.33	2902786.50	88.3	60 - 125	
209 Bi	1084962.1	15.93	1175901.50	92.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7879

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30100.D\98L30100.D#
Date Acquired:	Dec 28 2006 03:00 am
Operator:	JEE
Sample Name:	CCV9
Misc Info:	
Vial Number:	1305
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.47	235399.50 ppb	0.41	45.00	90 - 110	
9 Be	43.99	65887.40 ppb	0.87	45.00	90 - 110	
11 B	49.26	48438.40 ppb	0.86	45.00	90 - 110	
23 Na	5178.00	4444945.00 ppb	0.93	4500.00	90 - 110	Fail
24 Mg	5019.00	30494910.00 ppb	0.62	4500.00	90 - 110	Fail
27 Al	4997.00	41123680.00 ppb	0.78	4500.00	90 - 110	Fail
39 K	4498.00	854683.50 ppb	0.12	4500.00	90 - 110	
40 Ca	4655.00	10072070.00 ppb	0.47	4500.00	90 - 110	
47 Ti	43.88	51863.79 ppb	0.13	45.00	90 - 110	
51 V	43.79	81741.18 ppb	0.12	45.00	90 - 110	
52 Cr	44.09	97415.67 ppb	0.39	45.00	90 - 110	
55 Mn	41.64	843993.69 ppb	0.62	45.00	90 - 110	
56 Fe	4626.00	13750080.00 ppb	0.55	4500.00	90 - 110	
59 Co	40.69	700023.63 ppb	0.22	45.00	90 - 110	
60 Ni	44.45	43625.41 ppb	0.58	45.00	90 - 110	
63 Cu	44.52	117778.80 ppb	0.25	45.00	90 - 110	
66 Zn	42.97	96757.84 ppb	0.73	45.00	90 - 110	
75 As	43.60	11562.40 ppb	0.47	45.00	90 - 110	
78 Se	46.67	4427.55 ppb	1.22	45.00	90 - 110	
88 Sr	40.76	838757.00 ppb	0.71	45.00	90 - 110	
89 Y	--------	2528779.00 ppb	--------	---	90 - 110	
95 Mo	44.03	138985.80 ppb	1.10	45.00	90 - 110	
107 Ag	44.59	292592.41 ppb	0.47	45.00	90 - 110	
111 Cd	43.70	66786.31 ppb	0.65	45.00	90 - 110	
118 Sn	43.49	183820.00 ppb	0.43	45.00	90 - 110	
121 Sb	43.21	223401.20 ppb	0.17	45.00	90 - 110	
137 Ba	45.56	86406.38 ppb	0.20	45.00	90 - 110	
205 Tl	45.78	342868.00 ppb	0.88	45.00	90 - 110	
208 Pb	46.78	464496.09 ppb	0.69	45.00	90 - 110	
235 U	0.36	2993.84 ppb	2.58	0.32	90 - 110	Fail
238 U	47.24	378211.91 ppb	1.30	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	395992.06	1.10	516131.41	76.7	60 - 125	
45 Sc	373939.56	0.42	751121.75	49.8	60 - 125	ISFail
45 Sc	73842.35	0.42	105116.80	70.2	60 - 125	
45 Sc	1889864.50	0.88	2578760.50	73.3	60 - 125	
72 Ge	93686.48	1.35	182569.23	51.3	60 - 125	ISFail
72 Ge	43735.92	0.68	62725.95	69.7	60 - 125	
72 Ge	381215.56	0.88	550487.25	69.3	60 - 125	
115 In	1933309.80	0.24	3088381.00	62.6	60 - 125	
159 Tb	1993989.80	0.42	2902786.50	68.7	60 - 125	
209 Bi	863060.69	0.56	1175901.50	73.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

4 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30101.D\98L30101.D#
Date Acquired:	Dec 28 2006 03:08 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB9
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.2053	27804.5 ppb	75.16	1.00	
9 Be	0.0166	43.3 ppb	88.91	1.00	
11 B	3.4740	5792.6 ppb	6.67	1.00	
23 Na	68.5200	190278.6 ppb	2.13	1.00	
24 Mg	2.5380	41648.1 ppb	0.41	1.00	
27 Al	1.7420	25192.7 ppb	1.86	1.00	
39 K	6.7190	13911.3 ppb	13.57	1.00	
40 Ca	3.8670	25797.6 ppb	10.04	1.00	
47 Ti	-0.0140	85.6 ppb	210.92	1.00	
51 V	0.0652	923.2 ppb	21.31	1.00	
52 Cr	-0.0023	252.9 ppb	351.51	1.00	
55 Mn	0.0088	1223.4 ppb	22.54	1.00	
56 Fe	1.0500	9572.8 ppb	5.58	1.00	
59 Co	0.0093	253.3 ppb	8.85	1.00	
60 Ni	0.0072	38.9 ppb	53.01	1.00	
63 Cu	-0.0264	232.7 ppb	3.40	1.00	
66 Zn	-0.0849	1063.4 ppb	28.92	1.00	
75 As	0.0422	32.2 ppb	51.29	1.00	
78 Se	0.0428	7.6 ppb	67.53	1.00	
88 Sr	0.0215	1583.5 ppb	17.20	1.00	
89 Y	--------	2463637.0 ppb	--------	1.00	
95 Mo	0.0414	160.0 ppb	12.53	1.00	
107 Ag	0.0168	198.9 ppb	10.74	1.00	
111 Cd	-0.0232	1129.6 ppb	239.09	1.00	
118 Sn	0.0787	1455.7 ppb	25.31	1.00	
121 Sb	0.1716	1142.3 ppb	11.84	1.00	
137 Ba	0.0141	84.4 ppb	107.50	1.00	
205 Tl	0.0825	684.5 ppb	8.49	1.00	
208 Pb	-0.0833	895.6 ppb	4.27	1.00	
235 U	0.0002	8.9 ppb	316.47	1.00	
238 U	0.0181	175.6 ppb	2.48	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	384694.2	0.95	516131.41	74.5	60 - 125	
45 Sc	367008.6	0.52	751121.75	48.9	60 - 125	ISFail
45 Sc	72671.5	1.04	105116.80	69.1	60 - 125	
45 Sc	1817013.1	2.14	2578760.50	70.5	60 - 125	
72 Ge	91893.9	0.21	182569.23	50.3	60 - 125	ISFail
72 Ge	42823.9	0.33	62725.95	68.3	60 - 125	
72 Ge	352375.9	1.15	550487.25	64.0	60 - 125	
115 In	1901696.3	0.54	3088381.00	61.6	60 - 125	
159 Tb	1947176.9	1.56	2902786.50	67.1	60 - 125	
209 Bi	853191.1	0.25	1175901.50	72.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30102.D\98L30102.D#
Date Acquired: Dec 28 2006 03:17 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: IML033SB
Misc Info:
Vial Number: 3308
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	28485.8	0.0000	0.2398	ppb	14.25	400.00	
9 Be	# 3	6	17.8	0.0000	-0.0011	ppb	682.17	400.00	
11 B	# 3	6	4644.3	0.0000	2.1060	ppb	7.20	400.00	
23 Na	# 1	45	189451.3	0.0000	75.2100	ppb	3.83	300000.00	
24 Mg	# 3	45	32156.9	0.0000	0.8896	ppb	12.67	200000.00	
27 Al	# 3	45	30267.9	0.0000	2.3690	ppb	1.01	200000.00	
39 K	# 2	45	14932.5	0.0000	12.3600	ppb	16.18	100000.00	
40 Ca	# 1	45	97004.4	0.0000	38.9800	ppb	1.16	300000.00	
47 Ti	# 3	45	143.3	0.0000	0.0370	ppb	44.78	3000.00	
51 V	# 2	45	922.7	0.0000	0.0655	ppb	33.14	3000.00	
52 Cr	# 2	45	259.8	0.0000	0.0009	ppb	311.61	3000.00	
55 Mn	# 3	45	3886.3	0.0000	0.1448	ppb	3.15	3000.00	
56 Fe	# 1	45	7557.0	0.0000	0.4447	ppb	10.65	100000.00	
59 Co	# 3	45	136.7	0.0000	0.0022	ppb	67.34	3000.00	
60 Ni	# 2	45	109.3	0.0000	0.0803	ppb	13.60	3000.00	
63 Cu	# 2	45	710.9	0.0000	0.1580	ppb	1.90	3000.00	
66 Zn	# 3	45	5386.9	0.0000	1.9290	ppb	3.17	3000.00	
75 As	# 2	45	24.0	0.0000	0.0108	ppb	354.88	3000.00	
78 Se	# 1	72	3.3	0.0000	-0.0014	ppb	530.17	3000.00	
88 Sr	# 3	72	1986.9	0.0000	0.0433	ppb	12.86	3000.00	
89 Y	# 3	---	2448583.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	95.6	0.0000	0.0211	ppb	13.97	3000.00	
107 Ag	# 3	115	126.7	0.0000	0.0059	ppb	49.23	250.00	
111 Cd	# 3	115	1107.8	0.0000	-0.0274	ppb	40.25	3000.00	
118 Sn	# 3	115	4323.2	0.0000	0.7878	ppb	3.27	3000.00	
121 Sb	# 3	115	332.2	0.0000	0.0130	ppb	57.46	3000.00	
137 Ba	# 3	115	140.0	0.0000	0.0450	ppb	4.82	3000.00	
205 Tl	# 3	209	195.6	0.0000	0.0161	ppb	2.60	3000.00	
208 Pb	# 3	209	900.1	0.0000	-0.0839	ppb	4.57	3000.00	
235 U	# 3	209	1.1	0.0000	-0.0007	ppb	30.91	3000.00	
238 U	# 3	209	60.0	0.0000	0.0034	ppb	33.20	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	391853.41	1.82	516131.41	75.9	60 - 125	
45 Sc # 1	355210.38	0.13	751121.75	47.3	60 - 125	ISFail
45 Sc # 2	72585.19	0.47	105116.80	69.1	60 - 125	
45 Sc # 3	1824454.80	1.64	2578760.50	70.7	60 - 125	
72 Ge # 1	88886.42	0.86	182569.23	48.7	60 - 125	ISFail
72 Ge # 2	42706.87	0.30	62725.95	68.1	60 - 125	
72 Ge # 3	350732.91	1.73	550487.25	63.7	60 - 125	
115 In # 3	1874640.80	0.63	3088381.00	60.7	60 - 125	
159 Tb # 3	1924142.00	0.91	2902786.50	66.3	60 - 125	
209 Bi # 3	863031.00	0.40	1175901.50	73.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30103.D\98L30103.D#
Date Acquired: Dec 28 2006 03:26 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: IML033SL
Misc Info:
Vial Number: 3309
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	236349.2	0.0000	46.8100	ppb	0.88	400.00	
9 Be	# 3	6	67454.1	0.0000	46.9300	ppb	0.84	400.00	
11 B	# 3	6	50262.9	0.0000	53.5100	ppb	0.34	400.00	
23 Na	# 1	45	4159666.0	0.0000	5564.0000	ppb	0.65	300000.00	
24 Mg	# 3	45	30658340.0	0.0000	5314.0000	ppb	0.09	200000.00	
27 Al	# 3	45	41311792.0	0.0000	5287.0000	ppb	1.10	200000.00	
39 K	# 2	45	877091.2	0.0000	4833.0000	ppb	0.75	100000.00	
40 Ca	# 1	45	9379521.0	0.0000	4968.0000	ppb	1.17	300000.00	
47 Ti	# 3	45	52903.2	0.0000	47.1500	ppb	0.44	3000.00	
51 V	# 2	45	83972.0	0.0000	47.0900	ppb	0.99	3000.00	
52 Cr	# 2	45	99469.6	0.0000	47.1000	ppb	0.94	3000.00	
55 Mn	# 3	45	851977.1	0.0000	44.2700	ppb	0.73	3000.00	
56 Fe	# 1	45	12722470.0	0.0000	4905.0000	ppb	0.81	100000.00	
59 Co	# 3	45	703968.9	0.0000	43.1000	ppb	0.77	3000.00	
60 Ni	# 2	45	43246.6	0.0000	46.0900	ppb	0.71	3000.00	
63 Cu	# 2	45	116900.9	0.0000	46.2200	ppb	0.65	3000.00	
66 Zn	# 3	45	94390.4	0.0000	44.1600	ppb	0.79	3000.00	
75 As	# 2	45	11335.3	0.0000	44.7100	ppb	0.71	3000.00	
78 Se	# 1	72	3967.4	0.0000	48.0300	ppb	2.17	3000.00	
88 Sr	# 3	72	823028.2	0.0000	43.2300	ppb	0.25	3000.00	
89 Y	# 3	---	2348891.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	137678.6	0.0000	48.0300	ppb	1.14	3000.00	
107 Ag	# 3	115	332818.5	0.0000	55.8400	ppb	1.21	250.00	
111 Cd	# 3	115	63592.5	0.0000	45.8500	ppb	0.63	3000.00	
118 Sn	# 3	115	192120.6	0.0000	50.0800	ppb	0.25	3000.00	
121 Sb	# 3	115	218854.4	0.0000	46.6000	ppb	0.73	3000.00	
137 Ba	# 3	115	83096.0	0.0000	48.2400	ppb	1.68	3000.00	
205 Tl	# 3	209	342170.8	0.0000	48.3500	ppb	0.56	3000.00	
208 Pb	# 3	209	467839.1	0.0000	49.8700	ppb	0.13	3000.00	
235 U	# 3	209	844.5	0.0000	0.1062	ppb	14.22	3000.00	
238 U	# 3	209	394343.7	0.0000	52.1300	ppb	0.93	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	379988.78	1.32	516131.41	73.6	60 - 125	
45 Sc # 1	326320.63	0.19	751121.75	43.4	60 - 125	ISFail
45 Sc # 2	70600.21	1.04	105116.80	67.2	60 - 125	
45 Sc # 3	1794560.10	1.01	2578760.50	69.6	60 - 125	
72 Ge # 1	81558.59	0.55	182569.23	44.7	60 - 125	ISFail
72 Ge # 2	40546.49	1.08	62725.95	64.6	60 - 125	
72 Ge # 3	352707.22	0.64	550487.25	64.1	60 - 125	
115 In # 3	1756102.90	0.85	3088381.00	56.9	60 - 125	ISFail
159 Tb # 3	1807901.40	1.53	2902786.50	62.3	60 - 125	
209 Bi # 3	815524.69	0.52	1175901.50	69.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

T063

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30104.D\98L30104.D#
Date Acquired: Dec 28 2006 03:35 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: IML033SC
Misc Info:
Vial Number: 3310
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	243167.6	0.0000	47.4000	ppb	1.14	400.00	
9 Be	# 3	6	70631.6	0.0000	48.2900	ppb	0.91	400.00	
11 B	# 3	6	51859.1	0.0000	54.3000	ppb	1.22	400.00	
23 Na	# 1	45	4374850.0	0.0000	5799.0000	ppb	0.80	300000.00	
24 Mg	# 3	45	31868140.0	0.0000	5412.0000	ppb	0.56	200000.00	
27 Al	# 3	45	42919660.0	0.0000	5382.0000	ppb	0.11	200000.00	
39 K	# 2	45	917402.1	0.0000	5064.0000	ppb	1.18	100000.00	
40 Ca	# 1	45	9768648.0	0.0000	5121.0000	ppb	1.25	300000.00	
47 Ti	# 3	45	55635.6	0.0000	48.5800	ppb	0.59	3000.00	
51 V	# 2	45	87137.0	0.0000	48.9400	ppb	0.50	3000.00	
52 Cr	# 2	45	103125.6	0.0000	48.8900	ppb	0.32	3000.00	
55 Mn	# 3	45	884465.5	0.0000	45.0300	ppb	0.60	3000.00	
56 Fe	# 1	45	13338050.0	0.0000	5090.0000	ppb	0.30	100000.00	
59 Co	# 3	45	731515.6	0.0000	43.8800	ppb	0.70	3000.00	
60 Ni	# 2	45	44904.4	0.0000	47.9200	ppb	0.53	3000.00	
63 Cu	# 2	45	121700.4	0.0000	48.1800	ppb	0.23	3000.00	
66 Zn	# 3	45	97655.7	0.0000	44.7800	ppb	1.21	3000.00	
75 As	# 2	45	11644.5	0.0000	45.9900	ppb	1.09	3000.00	
78 Se	# 1	72	4284.4	0.0000	49.7100	ppb	1.84	3000.00	
88 Sr	# 3	72	858476.7	0.0000	44.4600	ppb	0.29	3000.00	
89 Y	# 3	---	2386570.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	142212.2	0.0000	49.3300	ppb	1.55	3000.00	
107 Ag	# 3	115	343371.5	0.0000	57.2900	ppb	0.59	250.00	
111 Cd	# 3	115	66437.4	0.0000	47.6700	ppb	1.33	3000.00	
118 Sn	# 3	115	200219.1	0.0000	51.9100	ppb	1.91	3000.00	
121 Sb	# 3	115	229189.6	0.0000	48.5400	ppb	2.43	3000.00	
137 Ba	# 3	115	85703.7	0.0000	49.4700	ppb	1.00	3000.00	
205 Tl	# 3	209	354439.4	0.0000	50.2600	ppb	0.38	3000.00	
208 Pb	# 3	209	480206.1	0.0000	51.3700	ppb	0.06	3000.00	
235 U	# 3	209	887.8	0.0000	0.1120	ppb	8.30	3000.00	
238 U	# 3	209	403965.3	0.0000	53.5900	ppb	0.73	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	386645.91	0.69	516131.41	74.9	60 - 125	
45 Sc # 1	329716.91	0.49	751121.75	43.9	60 - 125	ISFail
45 Sc # 2	70508.50	0.13	105116.80	67.1	60 - 125	
45 Sc # 3	1831515.10	0.79	2578760.50	71.0	60 - 125	
72 Ge # 1	85104.15	1.07	182569.23	46.6	60 - 125	ISFail
72 Ge # 2	40984.54	0.54	62725.95	65.3	60 - 125	
72 Ge # 3	357724.41	0.73	550487.25	65.0	60 - 125	
115 In # 3	1766119.80	1.39	3088381.00	57.2	60 - 125	ISFail
159 Tb # 3	1832999.10	0.18	2902786.50	63.1	60 - 125	
209 Bi # 3	812655.13	0.22	1175901.50	69.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7864

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30105.D\98L30105.D#
Date Acquired: Dec 28 2006 03:43 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-01A
Misc Info:
Vial Number: 3311
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	290938.0	0.0000	56.8000	ppb	0.56	400.00	
9 Be	# 3	6	73402.5	0.0000	49.3400	ppb	0.89	400.00	
11 B	# 3	6	53920.5	0.0000	55.5800	ppb	0.85	400.00	
23 Na	# 1	45	4709143.0	0.0000	5969.0000	ppb	1.80	300000.00	
24 Mg	# 3	45	53912340.0	0.0000	8900.0000	ppb	1.10	200000.00	
27 Al	# 3	45	91792720.0	0.0000	11190.0000	ppb	0.87	200000.00	
39 K	# 2	45	1427939.0	0.0000	7724.0000	ppb	0.94	100000.00	
40 Ca	# 1	45	13712460.0	0.0000	6871.0000	ppb	0.53	300000.00	
47 Ti	# 3	45	1181438.0	0.0000	1004.0000	ppb	1.21	3000.00	
51 V	# 2	45	137757.4	0.0000	75.7000	ppb	0.11	3000.00	
52 Cr	# 2	45	118537.2	0.0000	54.8200	ppb	0.08	3000.00	
55 Mn	# 3	45	3467736.0	0.0000	171.7000	ppb	0.40	3000.00	
56 Fe	# 1	45	40744060.0	0.0000	14860.0000	ppb	1.06	100000.00	
59 Co	# 3	45	812723.0	0.0000	47.3700	ppb	0.40	3000.00	
60 Ni	# 2	45	48941.8	0.0000	50.9400	ppb	0.52	3000.00	
63 Cu	# 2	45	144940.6	0.0000	55.9800	ppb	0.23	3000.00	
66 Zn	# 3	45	159202.5	0.0000	71.2700	ppb	0.88	3000.00	
75 As	# 2	45	12275.5	0.0000	47.2800	ppb	1.30	3000.00	
78 Se	# 1	72	4342.2	0.0000	46.9900	ppb	0.29	3000.00	
88 Sr	# 3	72	1164671.0	0.0000	53.1300	ppb	1.61	3000.00	
89 Y	# 3	---	2502244.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	147297.6	0.0000	50.8200	ppb	3.75	3000.00	
107 Ag	# 3	115	302442.9	0.0000	50.2000	ppb	4.50	250.00	
111 Cd	# 3	115	68163.9	0.0000	48.6700	ppb	4.10	3000.00	
118 Sn	# 3	115	209075.4	0.0000	53.9100	ppb	2.33	3000.00	
121 Sb	# 3	115	233620.6	0.0000	49.2100	ppb	3.50	3000.00	
137 Ba	# 3	115	194142.9	0.0000	111.5000	ppb	4.78	3000.00	
205 Tl	# 3	209	361548.2	0.0000	51.4000	ppb	0.42	3000.00	
208 Pb	# 3	209	537034.4	0.0000	57.6200	ppb	0.46	3000.00	
235 U	# 3	209	3073.9	0.0000	0.3911	ppb	3.28	3000.00	
238 U	# 3	209	410556.0	0.0000	54.6000	ppb	0.41	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	393244.09	0.58	516131.41	76.2	60 - 125	
45 Sc # 1	345086.09	0.97	751121.75	45.9	60 - 125	ISFail
45 Sc # 2	72296.11	0.26	105116.80	68.8	60 - 125	
45 Sc # 3	1884754.80	0.13	2578760.50	73.1	60 - 125	
72 Ge # 1	91238.02	0.90	182569.23	50.0	60 - 125	ISFail
72 Ge # 2	44218.61	0.85	62725.95	70.5	60 - 125	
72 Ge # 3	406224.94	1.78	550487.25	73.8	60 - 125	
115 In # 3	1776975.00	3.68	3088381.00	57.5	60 - 125	ISFail
159 Tb # 3	1836204.40	5.54	2902786.50	63.3	60 - 125	
209 Bi # 3	810590.31	0.57	1175901.50	68.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7085

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30106.D\98L30106.D#
Date Acquired: Dec 28 2006 03:52 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-01M
Misc Info:
Vial Number: 3312
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	263592.3	0.0000	49.5400	ppb	0.24	400.00	
9 Be	# 3	6	66217.0	0.0000	43.4400	ppb	1.14	400.00	
11 B	# 3	6	49724.1	0.0000	49.7300	ppb	1.13	400.00	
23 Na	# 1	45	4305543.0	0.0000	5343.0000	ppb	0.77	300000.00	
24 Mg	# 3	45	49913220.0	0.0000	8223.0000	ppb	0.17	200000.00	
27 Al	# 3	45	85383992.0	0.0000	10380.0000	ppb	0.12	200000.00	
39 K	# 2	45	1321957.0	0.0000	7052.0000	ppb	1.24	100000.00	
40 Ca	# 1	45	12248110.0	0.0000	6027.0000	ppb	0.78	300000.00	
47 Ti	# 3	45	1082476.0	0.0000	918.3000	ppb	0.70	3000.00	
51 V	# 2	45	126618.0	0.0000	68.6400	ppb	0.89	3000.00	
52 Cr	# 2	45	107455.9	0.0000	49.0500	ppb	0.52	3000.00	
55 Mn	# 3	45	3282499.0	0.0000	162.2000	ppb	0.29	3000.00	
56 Fe	# 1	45	38684928.0	0.0000	13860.0000	ppb	1.07	100000.00	
59 Co	# 3	45	726044.0	0.0000	42.2300	ppb	0.19	3000.00	
60 Ni	# 2	45	43549.8	0.0000	44.7300	ppb	0.26	3000.00	
63 Cu	# 2	45	128375.8	0.0000	48.9300	ppb	0.81	3000.00	
66 Zn	# 3	45	136522.2	0.0000	60.9100	ppb	0.10	3000.00	
75 As	# 2	45	10611.4	0.0000	40.3300	ppb	0.56	3000.00	
78 Se	# 1	72	3778.9	0.0000	41.2600	ppb	2.65	3000.00	
88 Sr	# 3	72	1010265.0	0.0000	46.5100	ppb	3.30	3000.00	
89 Y	# 3	---	2497345.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	126478.6	0.0000	43.0300	ppb	2.31	3000.00	
107 Ag	# 3	115	304830.7	0.0000	49.8900	ppb	3.01	250.00	
111 Cd	# 3	115	60113.4	0.0000	42.2200	ppb	3.05	3000.00	
118 Sn	# 3	115	178347.3	0.0000	45.3200	ppb	1.94	3000.00	
121 Sb	# 3	115	113527.8	0.0000	23.5600	ppb	2.49	3000.00	
137 Ba	# 3	115	177654.7	0.0000	100.6000	ppb	3.41	3000.00	
205 Tl	# 3	209	320973.3	0.0000	46.3400	ppb	0.86	3000.00	
208 Pb	# 3	209	465708.8	0.0000	50.7200	ppb	0.70	3000.00	
235 U	# 3	209	802.3	0.0000	0.1030	ppb	5.58	3000.00	
238 U	# 3	209	365124.0	0.0000	49.3100	ppb	0.99	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	402932.06	1.35	516131.41	78.1	60 - 125	
45 Sc # 1	351383.41	0.82	751121.75	46.8	60 - 125	ISFail
45 Sc # 2	73242.48	0.79	105116.80	69.7	60 - 125	
45 Sc # 3	1888609.50	0.76	2578760.50	73.2	60 - 125	
72 Ge # 1	90438.21	1.56	182569.23	49.5	60 - 125	ISFail
72 Ge # 2	43586.54	0.72	62725.95	69.5	60 - 125	
72 Ge # 3	402392.06	0.78	550487.25	73.1	60 - 125	
115 In # 3	1801045.10	2.50	3088381.00	58.3	60 - 125	ISFail
159 Tb # 3	1760890.80	5.89	2902786.50	60.7	60 - 125	
209 Bi # 3	798229.06	0.46	1175901.50	67.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7865

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30107.D\98L30107.D#
Date Acquired: Dec 28 2006 04:01 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-01S
Misc Info:
Vial Number: 3401
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	263799.0	0.0000	49.4600	ppb	0.73	400.00	
9 Be	# 3	6	65481.0	0.0000	42.8600	ppb	0.49	400.00	
11 B	# 3	6	49178.9	0.0000	49.0200	ppb	0.80	400.00	
23 Na	# 1	45	4332651.0	0.0000	5385.0000	ppb	0.80	300000.00	
24 Mg	# 3	45	50598072.0	0.0000	8332.0000	ppb	0.58	200000.00	
27 Al	# 3	45	87340352.0	0.0000	10620.0000	ppb	0.91	200000.00	
39 K	# 2	45	1334298.0	0.0000	7155.0000	ppb	1.03	100000.00	
40 Ca	# 1	45	12456270.0	0.0000	6138.0000	ppb	0.32	300000.00	
47 Ti	# 3	45	1117317.0	0.0000	947.4000	ppb	0.55	3000.00	
51 V	# 2	45	127088.9	0.0000	69.2500	ppb	0.34	3000.00	
52 Cr	# 2	45	107493.1	0.0000	49.3100	ppb	0.67	3000.00	
55 Mn	# 3	45	3418563.0	0.0000	168.9000	ppb	0.85	3000.00	
56 Fe	# 1	45	39278560.0	0.0000	14090.0000	ppb	0.77	100000.00	
59 Co	# 3	45	727983.3	0.0000	42.3300	ppb	0.52	3000.00	
60 Ni	# 2	45	43567.9	0.0000	44.9800	ppb	0.60	3000.00	
63 Cu	# 2	45	128989.6	0.0000	49.4200	ppb	0.56	3000.00	
66 Zn	# 3	45	140647.5	0.0000	62.7400	ppb	0.35	3000.00	
75 As	# 2	45	10620.0	0.0000	40.5700	ppb	1.24	3000.00	
78 Se	# 1	72	3852.0	0.0000	41.5600	ppb	1.11	3000.00	
88 Sr	# 3	72	1037083.0	0.0000	47.2700	ppb	2.64	3000.00	
89 Y	# 3	---	2547137.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	127317.8	0.0000	44.8800	ppb	3.47	3000.00	
107 Ag	# 3	115	310004.1	0.0000	52.5700	ppb	4.48	250.00	
111 Cd	# 3	115	59939.4	0.0000	43.6400	ppb	3.59	3000.00	
118 Sn	# 3	115	179103.7	0.0000	47.1600	ppb	3.44	3000.00	
121 Sb	# 3	115	110990.0	0.0000	23.8600	ppb	4.35	3000.00	
137 Ba	# 3	115	182723.7	0.0000	107.3000	ppb	4.31	3000.00	
205 Tl	# 3	209	317252.1	0.0000	45.6200	ppb	0.58	3000.00	
208 Pb	# 3	209	464894.6	0.0000	50.4300	ppb	0.16	3000.00	
235 U	# 3	209	823.4	0.0000	0.1053	ppb	6.43	3000.00	
238 U	# 3	209	363516.3	0.0000	48.9000	ppb	0.87	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	403847.25	0.74	516131.41	78.2	60 - 125	
45 Sc # 1	350887.06	0.66	751121.75	46.7	60 - 125	ISFail
45 Sc # 2	72870.32	0.25	105116.80	69.3	60 - 125	
45 Sc # 3	1889558.10	1.29	2578760.50	73.3	60 - 125	
72 Ge # 1	91515.40	0.65	182569.23	50.1	60 - 125	ISFail
72 Ge # 2	43945.45	0.64	62725.95	70.1	60 - 125	
72 Ge # 3	406497.47	0.92	550487.25	73.8	60 - 125	
115 In # 3	1739422.60	4.20	3088381.00	56.3	60 - 125	ISFail
159 Tb # 3	1881536.40	3.55	2902786.50	64.8	60 - 125	
209 Bi # 3	801455.69	0.16	1175901.50	68.2	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7867

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30108.D\98L30108.D#
Date Acquired: Dec 28 2006 04:09 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-01
Misc Info:
Vial Number: 3402
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	62104.6	0.0000	6.6330	ppb	0.48	400.00	
9 Be	# 3	6	174.5	0.0000	0.0969	ppb	10.65	400.00	
11 B	# 3	6	6172.8	0.0000	3.3300	ppb	6.52	400.00	
23 Na	# 1	45	424493.0	0.0000	360.9000	ppb	0.65	300000.00	
24 Mg	# 3	45	21778780.0	0.0000	3498.0000	ppb	0.26	200000.00	
27 Al	# 3	45	48872832.0	0.0000	5798.0000	ppb	0.75	200000.00	
39 K	# 2	45	496945.2	0.0000	2574.0000	ppb	0.25	100000.00	
40 Ca	# 1	45	3974142.0	0.0000	1887.0000	ppb	0.87	300000.00	
47 Ti	# 3	45	1141852.0	0.0000	945.1000	ppb	0.71	3000.00	
51 V	# 2	45	51591.7	0.0000	27.3500	ppb	0.79	3000.00	
52 Cr	# 2	45	14155.6	0.0000	6.2750	ppb	1.15	3000.00	
55 Mn	# 3	45	2613872.0	0.0000	126.0000	ppb	0.68	3000.00	
56 Fe	# 1	45	28669120.0	0.0000	9936.0000	ppb	1.49	100000.00	
59 Co	# 3	45	63495.0	0.0000	3.5980	ppb	1.07	3000.00	
60 Ni	# 2	45	2706.1	0.0000	2.7130	ppb	1.47	3000.00	
63 Cu	# 2	45	21635.7	0.0000	8.0450	ppb	0.31	3000.00	
66 Zn	# 3	45	59412.9	0.0000	25.5300	ppb	0.38	3000.00	
75 As	# 2	45	224.7	0.0000	0.7633	ppb	7.83	3000.00	
78 Se	# 1	72	8.7	0.0000	0.0533	ppb	62.56	3000.00	
88 Sr	# 3	72	200934.2	0.0000	9.2580	ppb	0.32	3000.00	
89 Y	# 3	---	2610003.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1060.1	0.0000	0.3406	ppb	11.88	3000.00	
107 Ag	# 3	115	462.3	0.0000	0.0596	ppb	6.51	250.00	
111 Cd	# 3	115	1169.9	0.0000	0.0253	ppb	73.77	3000.00	
118 Sn	# 3	115	17926.6	0.0000	4.1820	ppb	1.20	3000.00	
121 Sb	# 3	115	793.4	0.0000	0.1071	ppb	7.59	3000.00	
137 Ba	# 3	115	107025.5	0.0000	58.9300	ppb	0.67	3000.00	
205 Tl	# 3	209	3045.0	0.0000	0.4124	ppb	5.97	3000.00	
208 Pb	# 3	209	44950.9	0.0000	4.5440	ppb	0.79	3000.00	
235 U	# 3	209	28.9	0.0000	0.0027	ppb	77.07	3000.00	
238 U	# 3	209	3470.7	0.0000	0.4462	ppb	6.52	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	419339.31	1.14	516131.41	81.2	60 - 125	
45 Sc # 1	363098.34	0.48	751121.75	48.3	60 - 125	ISFail
45 Sc # 2	74184.29	0.22	105116.80	70.6	60 - 125	
45 Sc # 3	1935871.30	1.47	2578760.50	75.1	60 - 125	
72 Ge # 1	93714.53	1.93	182569.23	51.3	60 - 125	ISFail
72 Ge # 2	43919.58	0.22	62725.95	70.0	60 - 125	
72 Ge # 3	399952.06	0.72	550487.25	72.7	60 - 125	
115 In # 3	1851721.40	0.59	3088381.00	60.0	60 - 125	ISFail
159 Tb # 3	1883965.60	0.70	2902786.50	64.9	60 - 125	
209 Bi # 3	830945.56	0.08	1175901.50	70.7	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7088

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30109.D\98L30109.D#
Date Acquired: Dec 28 2006 04:18 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-01J
Misc Info:
Vial Number: 3403
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	37594.1	0.0000	1.4510	ppb	5.31	400.00	
9 Be	# 3	6	60.0	0.0000	0.0235	ppb	24.13	400.00	
11 B	# 3	6	4796.6	0.0000	1.7830	ppb	12.19	400.00	
23 Na	# 1	45	226413.0	0.0000	102.0000	ppb	5.13	300000.00	
24 Mg	# 3	45	4571802.0	0.0000	732.4000	ppb	0.78	200000.00	
27 Al	# 3	45	10237840.0	0.0000	1216.0000	ppb	0.37	200000.00	
39 K	# 2	45	114488.4	0.0000	539.8000	ppb	2.28	100000.00	
40 Ca	# 1	45	939218.0	0.0000	417.5000	ppb	0.54	300000.00	
47 Ti	# 3	45	226126.4	0.0000	187.5000	ppb	0.52	3000.00	
51 V	# 2	45	11461.8	0.0000	5.7290	ppb	0.75	3000.00	
52 Cr	# 2	45	3180.6	0.0000	1.3170	ppb	1.10	3000.00	
55 Mn	# 3	45	524039.0	0.0000	25.2800	ppb	0.14	3000.00	
56 Fe	# 1	45	6292832.0	0.0000	2072.0000	ppb	0.84	100000.00	
59 Co	# 3	45	13482.0	0.0000	0.7611	ppb	1.87	3000.00	
60 Ni	# 2	45	666.2	0.0000	0.6426	ppb	1.96	3000.00	
63 Cu	# 2	45	5156.8	0.0000	1.8280	ppb	2.14	3000.00	
66 Zn	# 3	45	17573.8	0.0000	7.1590	ppb	1.47	3000.00	
75 As	# 2	45	67.8	0.0000	0.1736	ppb	20.36	3000.00	
78 Se	# 1	72	6.0	0.0000	0.0243	ppb	27.38	3000.00	
88 Sr	# 3	72	43148.3	0.0000	2.0520	ppb	0.59	3000.00	
89 Y	# 3	---	2610789.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	237.8	0.0000	0.0651	ppb	6.09	3000.00	
107 Ag	# 3	115	178.9	0.0000	0.0132	ppb	15.60	250.00	
111 Cd	# 3	115	1037.1	0.0000	-0.0985	ppb	61.31	3000.00	
118 Sn	# 3	115	5977.3	0.0000	1.1480	ppb	3.19	3000.00	
121 Sb	# 3	115	342.2	0.0000	0.0129	ppb	96.82	3000.00	
137 Ba	# 3	115	22632.0	0.0000	11.8900	ppb	0.80	3000.00	
205 Tl	# 3	209	1176.8	0.0000	0.1494	ppb	8.03	3000.00	
208 Pb	# 3	209	9934.3	0.0000	0.8435	ppb	3.48	3000.00	
235 U	# 3	209	5.6	0.0000	-0.0002	ppb	225.89	3000.00	
238 U	# 3	209	792.3	0.0000	0.0963	ppb	5.36	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	432270.19	1.21	516131.41	83.8	60 - 125	
45 Sc # 1	381882.50	1.21	751121.75	50.8	60 - 125	ISFail
45 Sc # 2	74223.64	1.30	105116.80	70.6	60 - 125	
45 Sc # 3	1931102.60	0.84	2578760.50	74.9	60 - 125	
72 Ge # 1	94445.63	0.62	182569.23	51.7	60 - 125	ISFail
72 Ge # 2	43447.13	1.29	62725.95	69.3	60 - 125	
72 Ge # 3	378751.16	0.48	550487.25	68.8	60 - 125	
115 In # 3	1935996.40	0.56	3088381.00	62.7	60 - 125	
159 Tb # 3	1974995.00	0.52	2902786.50	68.0	60 - 125	
209 Bi # 3	850975.56	0.12	1175901.50	72.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7883

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30110.D\98L30110.D#
Date Acquired: Dec 28 2006 04:26 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-02
Misc Info:
Vial Number: 3404
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	44041.8	0.0000	2.6360	ppb	2.13	400.00	
9 Be	# 3	6	74.4	0.0000	0.0319	ppb	37.13	400.00	
11 B	# 3	6	5215.7	0.0000	2.1490	ppb	4.35	400.00	
23 Na	# 1	45	291398.2	0.0000	196.8000	ppb	4.09	300000.00	
24 Mg	# 3	45	7169637.0	0.0000	1163.0000	ppb	0.96	200000.00	
27 Al	# 3	45	17608980.0	0.0000	2114.0000	ppb	0.75	200000.00	
39 K	# 2	45	164949.4	0.0000	808.3000	ppb	0.74	100000.00	
40 Ca	# 1	45	1289014.0	0.0000	607.4000	ppb	0.94	300000.00	
47 Ti	# 3	45	404006.9	0.0000	338.4000	ppb	0.93	3000.00	
51 V	# 2	45	25508.8	0.0000	13.3000	ppb	1.01	3000.00	
52 Cr	# 2	45	6905.2	0.0000	2.9990	ppb	0.28	3000.00	
55 Mn	# 3	45	2044090.0	0.0000	99.7300	ppb	0.64	3000.00	
56 Fe	# 1	45	11573850.0	0.0000	4016.0000	ppb	1.51	100000.00	
59 Co	# 3	45	23080.3	0.0000	1.3200	ppb	0.57	3000.00	
60 Ni	# 2	45	915.4	0.0000	0.8961	ppb	5.46	3000.00	
63 Cu	# 2	45	6905.9	0.0000	2.4890	ppb	1.19	3000.00	
66 Zn	# 3	45	24730.2	0.0000	10.4200	ppb	0.17	3000.00	
75 As	# 2	45	139.3	0.0000	0.4422	ppb	13.11	3000.00	
78 Se	# 1	72	11.1	0.0000	0.0831	ppb	48.73	3000.00	
88 Sr	# 3	72	59678.9	0.0000	2.8810	ppb	0.23	3000.00	
89 Y	# 3	---	2513167.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	919.0	0.0000	0.2979	ppb	8.22	3000.00	
107 Ag	# 3	115	266.7	0.0000	0.0290	ppb	6.82	250.00	
111 Cd	# 3	115	1110.4	0.0000	-0.0057	ppb	553.77	3000.00	
118 Sn	# 3	115	15923.7	0.0000	3.7370	ppb	2.19	3000.00	
121 Sb	# 3	115	386.7	0.0000	0.0259	ppb	12.38	3000.00	
137 Ba	# 3	115	39704.0	0.0000	22.1300	ppb	2.04	3000.00	
205 Tl	# 3	209	1062.3	0.0000	0.1370	ppb	5.28	3000.00	
208 Pb	# 3	209	11939.6	0.0000	1.0750	ppb	0.43	3000.00	
235 U	# 3	209	18.9	0.0000	0.0015	ppb	16.51	3000.00	
238 U	# 3	209	1765.8	0.0000	0.2244	ppb	9.32	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	436285.44	1.08	516131.41	84.5	60 - 125	
45 Sc # 1	362502.19	1.17	751121.75	48.3	60 - 125	ISFail
45 Sc # 2	74198.99	1.02	105116.80	70.6	60 - 125	
45 Sc # 3	1912424.40	0.92	2578760.50	74.2	60 - 125	
72 Ge # 1	90383.91	0.60	182569.23	49.5	60 - 125	ISFail
72 Ge # 2	42319.95	0.44	62725.95	67.5	60 - 125	
72 Ge # 3	376272.13	0.74	550487.25	68.4	60 - 125	
115 In # 3	1827240.40	0.63	3088381.00	59.2	60 - 125	ISFail
159 Tb # 3	1853403.80	1.18	2902786.50	63.8	60 - 125	
209 Bi # 3	832999.44	0.19	1175901.50	70.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7888

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30111.D\98L30111.D#
Date Acquired: Dec 28 2006 04:35 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-03
Misc Info:
Vial Number: 3405
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	65775.7	0.0000	7.2340	ppb	0.99	400.00	
9 Be	# 3	6	266.7	0.0000	0.1532	ppb	2.40	400.00	
11 B	# 3	6	13272.7	0.0000	10.4100	ppb	0.70	400.00	
23 Na	# 1	45	724962.8	0.0000	713.2000	ppb	0.44	300000.00	
24 Mg	# 3	45	27320920.0	0.0000	4400.0000	ppb	0.23	200000.00	
27 Al	# 3	45	79315040.0	0.0000	9435.0000	ppb	0.52	200000.00	
39 K	# 2	45	576404.7	0.0000	3043.0000	ppb	0.55	100000.00	
40 Ca	# 1	45	18631930.0	0.0000	8681.0000	ppb	0.69	300000.00	
47 Ti	# 3	45	1122394.0	0.0000	931.4000	ppb	1.39	3000.00	
51 V	# 2	45	59912.7	0.0000	32.3200	ppb	0.58	3000.00	
52 Cr	# 2	45	52551.4	0.0000	23.9800	ppb	0.42	3000.00	
55 Mn	# 3	45	15351610.0	0.0000	742.2000	ppb	0.46	3000.00	
56 Fe	# 1	45	78038432.0	0.0000	26460.0000	ppb	0.94	100000.00	
59 Co	# 3	45	126801.1	0.0000	7.2100	ppb	0.80	3000.00	
60 Ni	# 2	45	22568.6	0.0000	23.2200	ppb	0.49	3000.00	
63 Cu	# 2	45	1970823.0	0.0000	754.7000	ppb	0.88	3000.00	
66 Zn	# 3	45	3099834.0	0.0000	1365.0000	ppb	0.58	3000.00	
75 As	# 2	45	1371.6	0.0000	5.1550	ppb	1.03	3000.00	
78 Se	# 1	72	34.0	0.0000	0.2839	ppb	11.24	3000.00	
88 Sr	# 3	72	825275.4	0.0000	32.9500	ppb	1.17	3000.00	
89 Y	# 3	---	2601883.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	5612.6	0.0000	1.8490	ppb	4.32	3000.00	
107 Ag	# 3	115	46255.3	0.0000	7.3550	ppb	1.48	250.00	
111 Cd	# 3	115	4010.5	0.0000	2.0030	ppb	2.48	3000.00	
118 Sn	# 3	115	204928.0	0.0000	50.7200	ppb	1.72	3000.00	
121 Sb	# 3	115	134276.4	0.0000	27.1200	ppb	0.85	3000.00	
137 Ba	# 3	115	373211.1	0.0000	205.8000	ppb	2.57	3000.00	
205 Tl	# 3	209	2414.8	0.0000	0.3345	ppb	3.79	3000.00	
208 Pb	# 3	209	8143902.0	0.0000	879.0000	ppb	0.71	3000.00	
235 U	# 3	209	50.0	0.0000	0.0055	ppb	30.85	3000.00	
238 U	# 3	209	5944.0	0.0000	0.7890	ppb	0.47	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	423821.44	1.15	516131.41	82.1	60 - 125	
45 Sc # 1	371227.34	0.23	751121.75	49.4	60 - 125	ISFail
45 Sc # 2	73069.20	0.67	105116.80	69.5	60 - 125	
45 Sc # 3	1931027.60	1.77	2578760.50	74.9	60 - 125	
72 Ge # 1	104151.14	1.01	182569.23	57.0	60 - 125	ISFail
72 Ge # 2	48059.11	0.64	62725.95	76.6	60 - 125	
72 Ge # 3	463864.56	1.56	550487.25	84.3	60 - 125	
115 In # 3	1850296.60	2.09	3088381.00	59.9	60 - 125	ISFail
159 Tb # 3	1785263.80	3.19	2902786.50	61.5	60 - 125	
209 Bi # 3	808022.50	0.08	1175901.50	68.7	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
3 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7691

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30112.D\98L30112.D#
Date Acquired:	Dec 28 2006 04:44 am
Operator:	JEE
Sample Name:	CCV10
Misc Info:	
Vial Number:	1307
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.09	257947.09 ppb	0.80	45.00	90 - 110	
9 Be	43.33	71676.34 ppb	0.75	45.00	90 - 110	
11 B	44.49	48588.92 ppb	2.50	45.00	90 - 110	
23 Na	5285.00	4612159.00 ppb	0.52	4500.00	90 - 110	Fail
24 Mg	5121.00	32051790.00 ppb	2.83	4500.00	90 - 110	Fail
27 Al	5033.00	42668032.00 ppb	3.12	4500.00	90 - 110	Fail
39 K	4526.00	854372.31 ppb	0.32	4500.00	90 - 110	
40 Ca	4679.00	10298800.00 ppb	0.67	4500.00	90 - 110	
47 Ti	44.10	53695.36 ppb	2.01	45.00	90 - 110	
51 V	44.36	82242.73 ppb	0.75	45.00	90 - 110	
52 Cr	44.76	98239.01 ppb	0.61	45.00	90 - 110	
55 Mn	41.98	876556.00 ppb	1.46	45.00	90 - 110	
56 Fe	4614.00	13951430.00 ppb	0.47	4500.00	90 - 110	
59 Co	41.25	731112.81 ppb	1.41	45.00	90 - 110	
60 Ni	45.18	44048.59 ppb	0.35	45.00	90 - 110	
63 Cu	44.95	118148.40 ppb	0.81	45.00	90 - 110	
66 Zn	42.51	98632.30 ppb	1.05	45.00	90 - 110	
75 As	43.29	11405.37 ppb	1.16	45.00	90 - 110	
78 Se	46.43	4487.79 ppb	1.12	45.00	90 - 110	
88 Sr	40.98	862797.13 ppb	0.48	45.00	90 - 110	
89 Y	--------	2581441.00 ppb	--------	---	90 - 110	
95 Mo	44.56	140825.59 ppb	0.89	45.00	90 - 110	
107 Ag	45.00	295642.91 ppb	0.38	45.00	90 - 110	
111 Cd	43.96	67247.84 ppb	0.89	45.00	90 - 110	
118 Sn	43.61	184555.41 ppb	0.59	45.00	90 - 110	
121 Sb	43.24	223852.20 ppb	0.54	45.00	90 - 110	
137 Ba	44.77	85013.27 ppb	1.43	45.00	90 - 110	
205 Tl	46.47	336274.19 ppb	0.41	45.00	90 - 110	
208 Pb	47.04	451439.91 ppb	0.39	45.00	90 - 110	
235 U	0.33	2660.42 ppb	3.92	0.32	90 - 110	
238 U	46.89	362764.31 ppb	0.50	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	437255.66	1.47	516131.41	84.7	60 - 125	
45 Sc	380393.53	0.59	751121.75	50.6	60 - 125	ISFail
45 Sc	73357.63	0.63	105116.80	69.8	60 - 125	
45 Sc	1947088.90	0.82	2578760.50	75.5	60 - 125	
72 Ge	95435.82	0.87	182569.23	52.3	60 - 125	ISFail
72 Ge	43421.47	0.51	62725.95	69.2	60 - 125	
72 Ge	390015.28	0.93	550487.25	70.8	60 - 125	
115 In	1935750.60	0.12	3088381.00	62.7	60 - 125	
159 Tb	1931310.00	1.44	2902786.50	66.5	60 - 125	
209 Bi	834021.00	0.15	1175901.50	70.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

7092

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30113.D\98L30113.D#
Date Acquired:	Dec 28 2006 04:52 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB10
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0471	31136.2 ppb	104.27	1.00	
9 Be	0.0134	44.4 ppb	36.46	1.00	
11 B	1.2470	4353.1 ppb	6.69	1.00	
23 Na	44.9300	177520.6 ppb	7.43	1.00	
24 Mg	2.4070	43089.3 ppb	1.73	1.00	
27 Al	1.8440	27395.1 ppb	1.94	1.00	
39 K	5.0130	13707.7 ppb	18.73	1.00	
40 Ca	5.0940	29483.2 ppb	0.69	1.00	
47 Ti	0.0152	124.5 ppb	130.96	1.00	
51 V	0.0488	900.7 ppb	12.33	1.00	
52 Cr	-0.0029	253.8 ppb	64.95	1.00	
55 Mn	0.0068	1250.1 ppb	9.35	1.00	
56 Fe	1.2100	10423.6 ppb	3.26	1.00	
59 Co	0.0106	290.0 ppb	13.67	1.00	
60 Ni	0.0060	38.0 ppb	72.22	1.00	
63 Cu	-0.0152	264.0 ppb	55.40	1.00	
66 Zn	-0.0105	1287.9 ppb	239.64	1.00	
75 As	0.0168	25.8 ppb	75.15	1.00	
78 Se	0.0177	5.3 ppb	118.73	1.00	
88 Sr	0.0297	1830.2 ppb	8.59	1.00	
89 Y	--------	2567231.0 ppb	--------	1.00	
95 Mo	0.0444	173.3 ppb	34.93	1.00	
107 Ag	0.0118	170.0 ppb	14.31	1.00	
111 Cd	-0.1000	1039.9 ppb	16.97	1.00	
118 Sn	0.0667	1437.9 ppb	18.69	1.00	
121 Sb	0.2944	1805.8 ppb	12.69	1.00	
137 Ba	0.0142	86.7 ppb	66.34	1.00	
205 Tl	0.0768	628.9 ppb	4.34	1.00	
208 Pb	-0.0740	965.6 ppb	4.08	1.00	
235 U	-0.0005	3.3 ppb	87.64	1.00	
238 U	0.0157	153.3 ppb	24.56	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	442185.7	1.22	516131.41	85.7	60 - 125	
45 Sc	381002.4	0.88	751121.75	50.7	60 - 125	ISFail
45 Sc	73256.8	0.33	105116.80	69.7	60 - 125	
45 Sc	1914993.3	1.41	2578760.50	74.3	60 - 125	
72 Ge	93838.1	0.36	182569.23	51.4	60 - 125	ISFail
72 Ge	42002.1	1.62	62725.95	67.0	60 - 125	
72 Ge	370731.1	0.38	550487.25	67.3	60 - 125	
115 In	1945493.8	0.96	3088381.00	63.0	60 - 125	
159 Tb	1928224.4	0.96	2902786.50	66.4	60 - 125	
209 Bi	834963.3	0.28	1175901.50	71.0	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7693

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30114.D\98L30114.D#
Date Acquired: Dec 28 2006 05:01 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-04
Misc Info:
Vial Number: 3406
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	43356.0	0.0000	2.1110	ppb	0.13	400.00	
9 Be	# 3	6	102.2	0.0000	0.0460	ppb	6.30	400.00	
11 B	# 3	6	4699.9	0.0000	1.4290	ppb	14.18	400.00	
23 Na	# 1	45	297667.2	0.0000	184.8000	ppb	3.05	300000.00	
24 Mg	# 3	45	6065139.0	0.0000	955.4000	ppb	1.04	200000.00	
27 Al	# 3	45	19382410.0	0.0000	2262.0000	ppb	0.56	200000.00	
39 K	# 2	45	125893.9	0.0000	598.1000	ppb	1.03	100000.00	
40 Ca	# 1	45	1250345.0	0.0000	556.8000	ppb	0.89	300000.00	
47 Ti	# 3	45	341411.0	0.0000	278.0000	ppb	0.68	3000.00	
51 V	# 2	45	31616.4	0.0000	16.5200	ppb	0.85	3000.00	
52 Cr	# 2	45	8904.0	0.0000	3.8870	ppb	1.57	3000.00	
55 Mn	# 3	45	625270.8	0.0000	29.6200	ppb	0.94	3000.00	
56 Fe	# 1	45	15393960.0	0.0000	5056.0000	ppb	0.69	100000.00	
59 Co	# 3	45	24749.0	0.0000	1.3760	ppb	0.82	3000.00	
60 Ni	# 2	45	952.5	0.0000	0.9298	ppb	2.39	3000.00	
63 Cu	# 2	45	12330.2	0.0000	4.5160	ppb	0.63	3000.00	
66 Zn	# 3	45	32326.1	0.0000	13.4000	ppb	1.29	3000.00	
75 As	# 2	45	206.7	0.0000	0.6927	ppb	6.25	3000.00	
78 Se	# 1	72	14.4	0.0000	0.1142	ppb	38.00	3000.00	
88 Sr	# 3	72	56753.2	0.0000	2.6400	ppb	0.55	3000.00	
89 Y	# 3	---	2629739.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	717.8	0.0000	0.2229	ppb	4.25	3000.00	
107 Ag	# 3	115	844.5	0.0000	0.1179	ppb	4.44	250.00	
111 Cd	# 3	115	1127.9	0.0000	-0.0184	ppb	356.36	3000.00	
118 Sn	# 3	115	18243.7	0.0000	4.1770	ppb	2.40	3000.00	
121 Sb	# 3	115	1528.0	0.0000	0.2499	ppb	6.33	3000.00	
137 Ba	# 3	115	24180.7	0.0000	13.0400	ppb	0.98	3000.00	
205 Tl	# 3	209	745.6	0.0000	0.0919	ppb	15.87	3000.00	
208 Pb	# 3	209	84435.4	0.0000	8.5530	ppb	0.32	3000.00	
235 U	# 3	209	30.0	0.0000	0.0028	ppb	44.09	3000.00	
238 U	# 3	209	3300.6	0.0000	0.4176	ppb	1.11	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	457517.44	1.42	516131.41	88.6	60 - 125	
45 Sc # 1	383059.28	0.72	751121.75	51.0	60 - 125	ISFail
45 Sc # 2	74484.98	1.05	105116.80	70.9	60 - 125	
45 Sc # 3	1967042.50	1.56	2578760.50	76.3	60 - 125	
72 Ge # 1	93648.37	0.62	182569.23	51.3	60 - 125	ISFail
72 Ge # 2	43208.61	0.86	62725.95	68.9	60 - 125	
72 Ge # 3	389640.03	0.63	550487.25	70.8	60 - 125	
115 In # 3	1886695.10	0.55	3088381.00	61.1	60 - 125	
159 Tb # 3	1902488.10	0.86	2902786.50	65.5	60 - 125	
209 Bi # 3	843875.69	0.31	1175901.50	71.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30115.D\98L30115.D#
Date Acquired: Dec 28 2006 05:10 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-05
Misc Info:
Vial Number: 3407
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	56111.4	0.0000	4.5880	ppb	2.15	400.00	
9 Be	# 3	6	156.7	0.0000	0.0785	ppb	18.62	400.00	
11 B	# 3	6	4924.5	0.0000	1.6910	ppb	6.43	400.00	
23 Na	# 1	45	403930.6	0.0000	290.1000	ppb	2.36	300000.00	
24 Mg	# 3	45	17785020.0	0.0000	2763.0000	ppb	0.43	200000.00	
27 Al	# 3	45	45345368.0	0.0000	5206.0000	ppb	0.62	200000.00	
39 K	# 2	45	452988.5	0.0000	2311.0000	ppb	0.48	100000.00	
40 Ca	# 1	45	2209483.0	0.0000	949.5000	ppb	0.69	300000.00	
47 Ti	# 3	45	1112005.0	0.0000	890.7000	ppb	1.09	3000.00	
51 V	# 2	45	47218.1	0.0000	24.6800	ppb	0.25	3000.00	
52 Cr	# 2	45	10704.9	0.0000	4.6570	ppb	1.41	3000.00	
55 Mn	# 3	45	3498176.0	0.0000	163.2000	ppb	0.70	3000.00	
56 Fe	# 1	45	32829810.0	0.0000	10340.0000	ppb	1.07	100000.00	
59 Co	# 3	45	64732.1	0.0000	3.5500	ppb	0.39	3000.00	
60 Ni	# 2	45	2149.1	0.0000	2.1210	ppb	1.06	3000.00	
63 Cu	# 2	45	25351.2	0.0000	9.3290	ppb	0.32	3000.00	
66 Zn	# 3	45	85415.2	0.0000	35.7400	ppb	1.05	3000.00	
75 As	# 2	45	399.1	0.0000	1.4010	ppb	1.05	3000.00	
78 Se	# 1	72	15.1	0.0000	0.1129	ppb	9.45	3000.00	
88 Sr	# 3	72	127561.0	0.0000	5.6320	ppb	1.58	3000.00	
89 Y	# 3	---	2701295.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1709.1	0.0000	0.5402	ppb	1.49	3000.00	
107 Ag	# 3	115	1102.3	0.0000	0.1567	ppb	4.96	250.00	
111 Cd	# 3	115	1165.4	0.0000	0.0004	ppb	5508.20	3000.00	
118 Sn	# 3	115	28931.0	0.0000	6.7260	ppb	0.66	3000.00	
121 Sb	# 3	115	2377.0	0.0000	0.4144	ppb	4.01	3000.00	
137 Ba	# 3	115	91915.9	0.0000	49.2500	ppb	0.27	3000.00	
205 Tl	# 3	209	1354.6	0.0000	0.1766	ppb	1.94	3000.00	
208 Pb	# 3	209	122317.3	0.0000	12.5800	ppb	1.07	3000.00	
235 U	# 3	209	26.7	0.0000	0.0024	ppb	51.76	3000.00	
238 U	# 3	209	3268.4	0.0000	0.4172	ppb	4.57	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	452605.41	1.37	516131.41	87.7	60 - 125	
45 Sc # 1	399420.66	1.54	751121.75	53.2	60 - 125	ISFail
45 Sc # 2	75108.61	0.77	105116.80	71.5	60 - 125	
45 Sc # 3	2000392.60	1.21	2578760.50	77.6	60 - 125	
72 Ge # 1	98707.39	0.82	182569.23	54.1	60 - 125	ISFail
72 Ge # 2	45156.34	0.11	62725.95	72.0	60 - 125	
72 Ge # 3	415643.78	1.25	550487.25	75.5	60 - 125	
115 In # 3	1902572.00	0.30	3088381.00	61.6	60 - 125	
159 Tb # 3	1916396.00	0.53	2902786.50	66.0	60 - 125	
209 Bi # 3	836633.88	0.59	1175901.50	71.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7855

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30116.D\98L30116.D#
Date Acquired: Dec 28 2006 05:18 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-06
Misc Info:
Vial Number: 3408
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	67394.9	0.0000	6.7990	ppb	1.94	400.00	
9 Be	# 3	6	218.9	0.0000	0.1158	ppb	10.98	400.00	
11 B	# 3	6	7068.8	0.0000	3.7640	ppb	2.59	400.00	
23 Na	# 1	45	546194.6	0.0000	445.1000	ppb	1.45	300000.00	
24 Mg	# 3	45	23079810.0	0.0000	3525.0000	ppb	0.28	200000.00	
27 Al	# 3	45	58984848.0	0.0000	6655.0000	ppb	0.18	200000.00	
39 K	# 2	45	641589.9	0.0000	3251.0000	ppb	0.94	100000.00	
40 Ca	# 1	45	4757190.0	0.0000	2037.0000	ppb	0.31	300000.00	
47 Ti	# 3	45	1322089.0	0.0000	1041.0000	ppb	0.61	3000.00	
51 V	# 2	45	56985.9	0.0000	29.4200	ppb	0.93	3000.00	
52 Cr	# 2	45	14567.3	0.0000	6.2840	ppb	1.31	3000.00	
55 Mn	# 3	45	4117427.0	0.0000	188.8000	ppb	0.35	3000.00	
56 Fe	# 1	45	40597540.0	0.0000	12690.0000	ppb	0.16	100000.00	
59 Co	# 3	45	78499.5	0.0000	4.2310	ppb	0.35	3000.00	
60 Ni	# 2	45	3773.7	0.0000	3.6940	ppb	3.05	3000.00	
63 Cu	# 2	45	80612.5	0.0000	29.4700	ppb	0.98	3000.00	
66 Zn	# 3	45	169210.7	0.0000	70.1400	ppb	0.39	3000.00	
75 As	# 2	45	364.0	0.0000	1.2500	ppb	5.91	3000.00	
78 Se	# 1	72	24.2	0.0000	0.1977	ppb	19.22	3000.00	
88 Sr	# 3	72	252957.8	0.0000	10.8900	ppb	0.06	3000.00	
89 Y	# 3	---	2759679.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1646.8	0.0000	0.5197	ppb	7.22	3000.00	
107 Ag	# 3	115	1171.2	0.0000	0.1672	ppb	5.09	250.00	
111 Cd	# 3	115	1352.1	0.0000	0.1260	ppb	46.21	3000.00	
118 Sn	# 3	115	30345.7	0.0000	7.0590	ppb	2.04	3000.00	
121 Sb	# 3	115	3875.3	0.0000	0.7084	ppb	2.21	3000.00	
137 Ba	# 3	115	153530.5	0.0000	82.1900	ppb	0.49	3000.00	
205 Tl	# 3	209	1726.9	0.0000	0.2268	ppb	7.34	3000.00	
208 Pb	# 3	209	238870.8	0.0000	24.6200	ppb	0.05	3000.00	
235 U	# 3	209	54.4	0.0000	0.0058	ppb	40.07	3000.00	
238 U	# 3	209	5357.0	0.0000	0.6832	ppb	1.44	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	449128.44	1.16	516131.41	87.0	60 - 125	
45 Sc # 1	402720.94	0.63	751121.75	53.6	60 - 125	ISFail
45 Sc # 2	76248.52	0.91	105116.80	72.5	60 - 125	
45 Sc # 3	2035508.90	0.77	2578760.50	78.9	60 - 125	
72 Ge # 1	101401.66	0.48	182569.23	55.5	60 - 125	ISFail
72 Ge # 2	46147.70	1.39	62725.95	73.6	60 - 125	
72 Ge # 3	428351.28	0.70	550487.25	77.8	60 - 125	
115 In # 3	1904888.10	0.83	3088381.00	61.7	60 - 125	
159 Tb # 3	1938598.80	1.03	2902786.50	66.8	60 - 125	
209 Bi # 3	840393.75	0.17	1175901.50	71.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7036

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30117.D\98L30117.D#
Date Acquired: Dec 28 2006 05:27 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-07
Misc Info:
Vial Number: 3409
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	91452.4	0.0000	11.2700	ppb	1.52	400.00	
9 Be	# 3	6	226.7	0.0000	0.1199	ppb	13.78	400.00	
11 B	# 3	6	10969.4	0.0000	7.4290	ppb	2.24	400.00	
23 Na	# 1	45	643669.8	0.0000	532.4000	ppb	1.90	300000.00	
24 Mg	# 3	45	32781200.0	0.0000	4988.0000	ppb	0.38	200000.00	
27 Al	# 3	45	79121504.0	0.0000	8890.0000	ppb	0.44	200000.00	
39 K	# 2	45	795359.1	0.0000	4001.0000	ppb	0.47	100000.00	
40 Ca	# 1	45	11015570.0	0.0000	4586.0000	ppb	0.98	300000.00	
47 Ti	# 3	45	1599259.0	0.0000	1254.0000	ppb	1.17	3000.00	
51 V	# 2	45	69098.5	0.0000	35.3700	ppb	0.74	3000.00	
52 Cr	# 2	45	44023.1	0.0000	19.0100	ppb	0.50	3000.00	
55 Mn	# 3	45	6548862.0	0.0000	299.1000	ppb	0.79	3000.00	
56 Fe	# 1	45	79755792.0	0.0000	24180.0000	ppb	0.84	100000.00	
59 Co	# 3	45	117515.7	0.0000	6.3110	ppb	0.42	3000.00	
60 Ni	# 2	45	11086.6	0.0000	10.7900	ppb	0.88	3000.00	
63 Cu	# 2	45	517680.0	0.0000	187.7000	ppb	0.66	3000.00	
66 Zn	# 3	45	709409.7	0.0000	294.7000	ppb	0.83	3000.00	
75 As	# 2	45	1112.1	0.0000	3.9420	ppb	1.92	3000.00	
78 Se	# 1	72	27.3	0.0000	0.2118	ppb	12.25	3000.00	
88 Sr	# 3	72	563538.7	0.0000	21.7500	ppb	0.95	3000.00	
89 Y	# 3	---	2837769.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	4981.2	0.0000	1.5950	ppb	2.53	3000.00	
107 Ag	# 3	115	19409.4	0.0000	2.9950	ppb	1.63	250.00	
111 Cd	# 3	115	2384.3	0.0000	0.8268	ppb	4.58	3000.00	
118 Sn	# 3	115	231485.5	0.0000	55.7800	ppb	0.33	3000.00	
121 Sb	# 3	115	17432.7	0.0000	3.3800	ppb	1.32	3000.00	
137 Ba	# 3	115	315506.8	0.0000	169.3000	ppb	0.57	3000.00	
205 Tl	# 3	209	2459.3	0.0000	0.3306	ppb	3.79	3000.00	
208 Pb	# 3	209	2063412.0	0.0000	216.1000	ppb	1.76	3000.00	
235 U	# 3	209	65.6	0.0000	0.0073	ppb	27.29	3000.00	
238 U	# 3	209	7954.2	0.0000	1.0260	ppb	1.30	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	451004.84	1.30	516131.41	87.4	60 - 125	
45 Sc # 1	415116.97	0.73	751121.75	55.3	60 - 125	ISFail
45 Sc # 2	77108.93	0.90	105116.80	73.4	60 - 125	
45 Sc # 3	2044149.10	1.52	2578760.50	79.3	60 - 125	
72 Ge # 1	107924.71	0.46	182569.23	59.1	60 - 125	ISFail
72 Ge # 2	49117.58	0.57	62725.95	78.3	60 - 125	
72 Ge # 3	479247.13	1.52	550487.25	87.1	60 - 125	
115 In # 3	1900898.90	0.87	3088381.00	61.6	60 - 125	
159 Tb # 3	1943599.50	0.49	2902786.50	67.0	60 - 125	
209 Bi # 3	832300.25	0.57	1175901.50	70.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

TEST

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30118.D\98L30118.D#
Date Acquired: Dec 28 2006 05:36 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-08
Misc Info:
Vial Number: 3410
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	46077.5	0.0000	2.5020	ppb	5.91	400.00	
9 Be	# 3	6	121.1	0.0000	0.0560	ppb	23.14	400.00	
11 B	# 3	6	19482.7	0.0000	14.9800	ppb	1.90	400.00	
23 Na	# 1	45	531443.9	0.0000	422.0000	ppb	1.39	300000.00	
24 Mg	# 3	45	13739720.0	0.0000	2131.0000	ppb	0.37	200000.00	
27 Al	# 3	45	18314510.0	0.0000	2100.0000	ppb	0.58	200000.00	
39 K	# 2	45	131875.6	0.0000	648.9000	ppb	2.03	100000.00	
40 Ca	# 1	45	304131010.0	0.0000	129300.0000	ppb	0.38	300000.00	
47 Ti	# 3	45	1508504.0	0.0000	1207.0000	ppb	0.46	3000.00	
51 V	# 2	45	19875.0	0.0000	10.5100	ppb	2.04	3000.00	
52 Cr	# 2	45	37871.9	0.0000	17.3800	ppb	1.43	3000.00	
55 Mn	# 3	45	10563540.0	0.0000	492.5000	ppb	0.17	3000.00	
56 Fe	# 1	45	176874000.0	0.0000	54660.0000	ppb	0.59	100000.00	
59 Co	# 3	45	425388.6	0.0000	23.3300	ppb	0.15	3000.00	
60 Ni	# 2	45	27040.3	0.0000	28.0500	ppb	1.88	3000.00	
63 Cu	# 2	45	703791.9	0.0000	271.5000	ppb	1.25	3000.00	
66 Zn	# 3	45	5554468.0	0.0000	2359.0000	ppb	0.19	3000.00	
75 As	# 2	45	591.8	0.0000	2.1950	ppb	4.87	3000.00	
78 Se	# 1	72	16.4	0.0000	0.0928	ppb	24.89	3000.00	
88 Sr	# 3	72	4154664.0	0.0000	130.2000	ppb	2.41	3000.00	
89 Y	# 3	---	2734938.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	8742.3	0.0000	2.7290	ppb	1.95	3000.00	
107 Ag	# 3	115	8555.6	0.0000	1.2760	ppb	0.83	250.00	
111 Cd	# 3	115	9632.0	0.0000	5.5570	ppb	2.05	3000.00	
118 Sn	# 3	115	3112563.0	0.0000	732.5000	ppb	0.63	3000.00	
121 Sb	# 3	115	18903.9	0.0000	3.5670	ppb	3.43	3000.00	
137 Ba	# 3	115	559003.9	0.0000	291.7000	ppb	0.80	3000.00	
205 Tl	# 3	209	1715.8	0.0000	0.2284	ppb	2.30	3000.00	
208 Pb	# 3	209	10396330.0	0.0000	1093.0000	ppb	0.10	3000.00	
235 U	# 3	209	71.1	0.0000	0.0080	ppb	19.97	3000.00	
238 U	# 3	209	8733.7	0.0000	1.1310	ppb	1.25	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	463692.22	1.11	516131.41	89.8	60 - 125	
45 Sc # 1	407303.72	1.14	751121.75	54.2	60 - 125	ISFail
45 Sc # 2	72507.52	1.48	105116.80	69.0	60 - 125	
45 Sc # 3	2002419.50	0.84	2578760.50	77.7	60 - 125	
72 Ge # 1	123672.98	1.07	182569.23	67.7	60 - 125	
72 Ge # 2	53906.75	0.76	62725.95	85.9	60 - 125	
72 Ge # 3	592104.94	2.33	550487.25	107.6	60 - 125	
115 In # 3	1955034.50	0.70	3088381.00	63.3	60 - 125	
159 Tb # 3	1937336.00	0.23	2902786.50	66.7	60 - 125	
209 Bi # 3	829503.69	0.37	1175901.50	70.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7038

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30119.D\98L30119.D#
Date Acquired: Dec 28 2006 05:44 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-09
Misc Info:
Vial Number: 3411
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	56182.7	0.0000	4.7920	ppb	1.91	400.00	
9 Be	# 3	6	177.8	0.0000	0.0926	ppb	9.68	400.00	
11 B	# 3	6	40595.4	0.0000	36.0200	ppb	1.89	400.00	
23 Na	# 1	45	1191868.0	0.0000	1068.0000	ppb	0.80	300000.00	
24 Mg	# 3	45	22430440.0	0.0000	3371.0000	ppb	0.30	200000.00	
27 Al	# 3	45	616761410.0	0.0000	68500.0000	ppb	0.57	200000.00	
39 K	# 2	45	333871.6	0.0000	1687.0000	ppb	0.73	100000.00	
40 Ca	# 1	45	25408380.0	0.0000	10110.0000	ppb	0.30	300000.00	
47 Ti	# 3	45	573062.9	0.0000	443.9000	ppb	0.43	3000.00	
51 V	# 2	45	37034.2	0.0000	19.2800	ppb	0.43	3000.00	
52 Cr	# 2	45	66441.1	0.0000	29.5600	ppb	1.25	3000.00	
55 Mn	# 3	45	19647270.0	0.0000	886.8000	ppb	1.11	3000.00	
56 Fe	# 1	45	68396128.0	0.0000	19800.0000	ppb	0.42	100000.00	
59 Co	# 3	45	80625.7	0.0000	4.2770	ppb	0.15	3000.00	
60 Ni	# 2	45	24889.1	0.0000	24.9500	ppb	1.02	3000.00	
63 Cu	# 2	45	8979779.0	0.0000	3349.0000	ppb	0.46	3000.00	>LRS
66 Zn	# 3	45	5205154.0	0.0000	2140.0000	ppb	0.54	3000.00	
75 As	# 2	45	1410.1	0.0000	5.1620	ppb	1.06	3000.00	
78 Se	# 1	72	105.8	0.0000	0.9080	ppb	15.19	3000.00	
88 Sr	# 3	72	3526374.0	0.0000	141.8000	ppb	0.23	3000.00	
89 Y	# 3	---	2787900.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	8464.3	0.0000	2.5910	ppb	2.44	3000.00	
107 Ag	# 3	115	145242.6	0.0000	21.4600	ppb	0.97	250.00	
111 Cd	# 3	115	6839.1	0.0000	3.6310	ppb	1.84	3000.00	
118 Sn	# 3	115	382011.8	0.0000	87.9400	ppb	0.52	3000.00	
121 Sb	# 3	115	66935.9	0.0000	12.5200	ppb	0.30	3000.00	
137 Ba	# 3	115	620716.2	0.0000	317.6000	ppb	1.06	3000.00	
205 Tl	# 3	209	1266.8	0.0000	0.1677	ppb	9.22	3000.00	
208 Pb	# 3	209	6231598.0	0.0000	661.4000	ppb	1.08	3000.00	
235 U	# 3	209	45.6	0.0000	0.0048	ppb	51.92	3000.00	
238 U	# 3	209	6373.1	0.0000	0.8321	ppb	0.59	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	444525.25	1.04	516131.41	86.1	60 - 125	
45 Sc # 1	434636.81	0.23	751121.75	57.9	60 - 125	ISFail
45 Sc # 2	75021.17	0.67	105116.80	71.4	60 - 125	
45 Sc # 3	2068363.30	1.44	2578760.50	80.2	60 - 125	
72 Ge # 1	110566.26	1.14	182569.23	60.6	60 - 125	
72 Ge # 2	46748.76	1.21	62725.95	74.5	60 - 125	
72 Ge # 3	461206.19	1.47	550487.25	83.9	60 - 125	
115 In # 3	1993433.90	1.24	3088381.00	64.5	60 - 125	
159 Tb # 3	1946234.80	2.86	2902786.50	67.0	60 - 125	
209 Bi # 3	821706.75	0.33	1175901.50	69.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

1 :Element Failures — 0 :Max. Number of Failures Allowed
1 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Fail

7833

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30120.D\98L30120.D#
Date Acquired: Dec 28 2006 05:53 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-10
Misc Info:
Vial Number: 3412
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	46385.1	0.0000	2.4030	ppb	3.06	400.00	
9 Be	# 3	6	90.0	0.0000	0.0373	ppb	4.29	400.00	
11 B	# 3	6	4738.8	0.0000	1.3290	ppb	9.10	400.00	
23 Na	# 1	45	344630.8	0.0000	187.4000	ppb	1.69	300000.00	
24 Mg	# 3	45	8158136.0	0.0000	1216.0000	ppb	0.78	200000.00	
27 Al	# 3	45	23682940.0	0.0000	2614.0000	ppb	0.75	200000.00	
39 K	# 2	45	197060.3	0.0000	941.3000	ppb	1.16	100000.00	
40 Ca	# 1	45	2367734.0	0.0000	922.9000	ppb	0.31	300000.00	
47 Ti	# 3	45	487330.2	0.0000	375.4000	ppb	0.90	3000.00	
51 V	# 2	45	30702.3	0.0000	15.5000	ppb	0.77	3000.00	
52 Cr	# 2	45	10133.8	0.0000	4.2930	ppb	1.06	3000.00	
55 Mn	# 3	45	1125172.0	0.0000	50.4500	ppb	0.61	3000.00	
56 Fe	# 1	45	20637180.0	0.0000	5899.0000	ppb	0.79	100000.00	
59 Co	# 3	45	31875.8	0.0000	1.6780	ppb	0.49	3000.00	
60 Ni	# 2	45	2274.9	0.0000	2.1920	ppb	0.81	3000.00	
63 Cu	# 2	45	82876.9	0.0000	30.0200	ppb	0.74	3000.00	
66 Zn	# 3	45	138107.0	0.0000	55.9100	ppb	0.73	3000.00	
75 As	# 2	45	215.6	0.0000	0.6998	ppb	7.59	3000.00	
78 Se	# 1	72	13.3	0.0000	0.0858	ppb	28.48	3000.00	
88 Sr	# 3	72	121015.6	0.0000	5.2670	ppb	0.91	3000.00	
89 Y	# 3	---	2813413.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1430.1	0.0000	0.4205	ppb	6.74	3000.00	
107 Ag	# 3	115	1249.0	0.0000	0.1669	ppb	3.71	250.00	
111 Cd	# 3	115	1255.9	0.0000	0.0066	ppb	784.56	3000.00	
118 Sn	# 3	115	51244.0	0.0000	11.3200	ppb	1.17	3000.00	
121 Sb	# 3	115	3125.0	0.0000	0.5215	ppb	4.61	3000.00	
137 Ba	# 3	115	83852.5	0.0000	42.0100	ppb	0.74	3000.00	
205 Tl	# 3	209	686.7	0.0000	0.0819	ppb	8.76	3000.00	
208 Pb	# 3	209	228023.1	0.0000	22.9200	ppb	0.51	3000.00	
235 U	# 3	209	21.1	0.0000	0.0017	ppb	61.57	3000.00	
238 U	# 3	209	2384.8	0.0000	0.2945	ppb	6.19	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	472322.50	0.91	516131.41	91.5	60 - 125	
45 Sc # 1	440179.38	0.33	751121.75	58.6	60 - 125	ISFail
45 Sc # 2	76971.83	1.24	105116.80	73.2	60 - 125	
45 Sc # 3	2079721.40	0.53	2578760.50	80.6	60 - 125	
72 Ge # 1	105972.09	0.46	182569.23	58.0	60 - 125	ISFail
72 Ge # 2	44798.50	0.17	62725.95	71.4	60 - 125	
72 Ge # 3	421313.13	1.19	550487.25	76.5	60 - 125	
115 In # 3	2034639.50	1.62	3088381.00	65.9	60 - 125	
159 Tb # 3	2004368.30	0.74	2902786.50	69.0	60 - 125	
209 Bi # 3	861336.13	0.49	1175901.50	73.2	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30121.D\98L30121.D#
Date Acquired: Dec 28 2006 06:01 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-11
Misc Info:
Vial Number: 3501
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	79788.7	0.0000	9.0080	ppb	1.91	400.00	
9 Be	# 3	6	300.0	0.0000	0.1621	ppb	11.89	400.00	
11 B	# 3	6	18323.3	0.0000	14.3100	ppb	0.96	400.00	
23 Na	# 1	45	803925.8	0.0000	717.2000	ppb	0.30	300000.00	
24 Mg	# 3	45	32760390.0	0.0000	5101.0000	ppb	0.33	200000.00	
27 Al	# 3	45	75723688.0	0.0000	8707.0000	ppb	0.30	200000.00	
39 K	# 2	45	607302.1	0.0000	3178.0000	ppb	0.28	100000.00	
40 Ca	# 1	45	26716930.0	0.0000	11280.0000	ppb	0.64	300000.00	
47 Ti	# 3	45	1126245.0	0.0000	903.4000	ppb	0.93	3000.00	
51 V	# 2	45	66607.6	0.0000	35.6200	ppb	0.82	3000.00	
52 Cr	# 2	45	53092.8	0.0000	23.9900	ppb	1.12	3000.00	
55 Mn	# 3	45	20833570.0	0.0000	973.7000	ppb	0.09	3000.00	
56 Fe	# 1	45	172970000.0	0.0000	53130.0000	ppb	1.25	100000.00	
59 Co	# 3	45	198643.8	0.0000	10.9200	ppb	0.19	3000.00	
60 Ni	# 2	45	27319.6	0.0000	27.8400	ppb	0.65	3000.00	
63 Cu	# 2	45	946182.4	0.0000	358.7000	ppb	0.44	3000.00	
66 Zn	# 3	45	4705344.0	0.0000	2003.0000	ppb	0.41	3000.00	
75 As	# 2	45	4441.9	0.0000	16.7100	ppb	0.81	3000.00	
78 Se	# 1	72	28.0	0.0000	0.1878	ppb	18.78	3000.00	
88 Sr	# 3	72	878930.3	0.0000	27.9400	ppb	1.30	3000.00	
89 Y	# 3	---	2751869.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	11604.8	0.0000	3.7940	ppb	1.39	3000.00	
107 Ag	# 3	115	13112.1	0.0000	2.0540	ppb	1.85	250.00	
111 Cd	# 3	115	6142.0	0.0000	3.4440	ppb	3.93	3000.00	
118 Sn	# 3	115	1613722.0	0.0000	397.2000	ppb	0.52	3000.00	
121 Sb	# 3	115	65139.5	0.0000	13.0000	ppb	1.47	3000.00	
137 Ba	# 3	115	602226.0	0.0000	328.7000	ppb	0.76	3000.00	
205 Tl	# 3	209	2108.1	0.0000	0.2917	ppb	4.91	3000.00	
208 Pb	# 3	209	7559689.0	0.0000	818.6000	ppb	0.35	3000.00	
235 U	# 3	209	44.4	0.0000	0.0048	ppb	20.64	3000.00	
238 U	# 3	209	4796.8	0.0000	0.6380	ppb	2.31	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	453038.22	1.12	516131.41	87.8	60 - 125	
45 Sc # 1	409801.28	0.19	751121.75	54.6	60 - 125	ISFail
45 Sc # 2	73800.35	0.24	105116.80	70.2	60 - 125	
45 Sc # 3	1997445.60	1.24	2578760.50	77.5	60 - 125	
72 Ge # 1	122283.72	0.15	182569.23	67.0	60 - 125	
72 Ge # 2	53695.83	0.43	62725.95	85.6	60 - 125	
72 Ge # 3	582475.31	2.07	550487.25	105.8	60 - 125	
115 In # 3	1868844.10	0.28	3088381.00	60.5	60 - 125	
159 Tb # 3	1887820.10	0.25	2902786.50	65.0	60 - 125	
209 Bi # 3	805395.69	0.39	1175901.50	68.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30122.D\98L30122.D#
Date Acquired:	Dec 28 2006 06:10 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	L280-12
Misc Info:	
Vial Number:	3502
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	89237.0	0.0000	10.8600	ppb	1.13	400.00	
9 Be	# 3	6	191.1	0.0000	0.0989	ppb	23.44	400.00	
11 B	# 3	6	7132.2	0.0000	3.7980	ppb	3.04	400.00	
23 Na	# 1	45	525884.8	0.0000	421.4000	ppb	0.60	300000.00	
24 Mg	# 3	45	24108520.0	0.0000	3709.0000	ppb	0.70	200000.00	
27 Al	# 3	45	61313472.0	0.0000	6968.0000	ppb	0.84	200000.00	
39 K	# 2	45	524679.6	0.0000	2757.0000	ppb	0.84	100000.00	
40 Ca	# 1	45	5976723.0	0.0000	2557.0000	ppb	1.23	300000.00	
47 Ti	# 3	45	1172401.0	0.0000	929.5000	ppb	0.98	3000.00	
51 V	# 2	45	47166.6	0.0000	25.2900	ppb	0.65	3000.00	
52 Cr	# 2	45	25004.8	0.0000	11.3200	ppb	1.04	3000.00	
55 Mn	# 3	45	8084368.0	0.0000	373.4000	ppb	1.14	3000.00	
56 Fe	# 1	45	63916368.0	0.0000	19940.0000	ppb	0.75	100000.00	
59 Co	# 3	45	83161.9	0.0000	4.5160	ppb	1.45	3000.00	
60 Ni	# 2	45	9626.5	0.0000	9.8630	ppb	1.39	3000.00	
63 Cu	# 2	45	341962.1	0.0000	130.5000	ppb	0.81	3000.00	
66 Zn	# 3	45	1601355.0	0.0000	673.5000	ppb	0.84	3000.00	
75 As	# 2	45	1137.6	0.0000	4.2520	ppb	2.02	3000.00	
78 Se	# 1	72	18.2	0.0000	0.1349	ppb	24.18	3000.00	
88 Sr	# 3	72	328637.7	0.0000	13.3900	ppb	1.16	3000.00	
89 Y	# 3	---	2783238.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	3742.9	0.0000	1.1960	ppb	7.63	3000.00	
107 Ag	# 3	115	6589.8	0.0000	1.0070	ppb	1.81	250.00	
111 Cd	# 3	115	4750.6	0.0000	2.4300	ppb	5.14	3000.00	
118 Sn	# 3	115	218203.4	0.0000	52.5500	ppb	0.26	3000.00	
121 Sb	# 3	115	20488.8	0.0000	3.9810	ppb	0.75	3000.00	
137 Ba	# 3	115	296338.6	0.0000	159.0000	ppb	0.57	3000.00	
205 Tl	# 3	209	1625.7	0.0000	0.2194	ppb	3.80	3000.00	
208 Pb	# 3	209	2317931.0	0.0000	247.4000	ppb	0.69	3000.00	
235 U	# 3	209	35.6	0.0000	0.0036	ppb	34.72	3000.00	
238 U	# 3	209	3783.0	0.0000	0.4953	ppb	3.04	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	450846.59	1.13	516131.41	87.4	60 - 125	
45 Sc # 1	403412.78	0.46	751121.75	53.7	60 - 125	ISFail
45 Sc # 2	73244.65	0.93	105116.80	69.7	60 - 125	
45 Sc # 3	2021024.80	1.68	2578760.50	78.4	60 - 125	
72 Ge # 1	104009.17	1.00	182569.23	57.0	60 - 125	ISFail
72 Ge # 2	45525.35	0.51	62725.95	72.6	60 - 125	
72 Ge # 3	453349.94	1.26	550487.25	82.4	60 - 125	
115 In # 3	1901265.80	0.34	3088381.00	61.6	60 - 125	
159 Tb # 3	1910799.80	1.44	2902786.50	65.8	60 - 125	
209 Bi # 3	816688.50	0.70	1175901.50	69.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

7102

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30123.D\98L30123.D#
Date Acquired: Dec 28 2006 06:19 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-13
Misc Info:
Vial Number: 3503
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	86407.4	0.0000	10.4400	ppb	0.98	400.00	
9 Be	# 3	6	281.1	0.0000	0.1527	ppb	12.90	400.00	
11 B	# 3	6	13159.2	0.0000	9.5940	ppb	2.96	400.00	
23 Na	# 1	45	850496.1	0.0000	770.9000	ppb	0.97	300000.00	
24 Mg	# 3	45	41138072.0	0.0000	6436.0000	ppb	0.17	200000.00	
27 Al	# 3	45	90857344.0	0.0000	10490.0000	ppb	0.59	200000.00	
39 K	# 2	45	653288.4	0.0000	3421.0000	ppb	0.78	100000.00	
40 Ca	# 1	45	22115730.0	0.0000	9361.0000	ppb	0.55	300000.00	
47 Ti	# 3	45	1324805.0	0.0000	1067.0000	ppb	0.61	3000.00	
51 V	# 2	45	70467.1	0.0000	37.6900	ppb	0.33	3000.00	
52 Cr	# 2	45	52714.9	0.0000	23.8000	ppb	0.58	3000.00	
55 Mn	# 3	45	13898300.0	0.0000	652.5000	ppb	0.29	3000.00	
56 Fe	# 1	45	100385700.0	0.0000	30920.0000	ppb	1.12	100000.00	
59 Co	# 3	45	167471.4	0.0000	9.2480	ppb	0.60	3000.00	
60 Ni	# 2	45	33785.9	0.0000	34.4100	ppb	0.33	3000.00	
63 Cu	# 2	45	1011124.0	0.0000	383.0000	ppb	0.55	3000.00	
66 Zn	# 3	45	2850296.0	0.0000	1219.0000	ppb	1.04	3000.00	
75 As	# 2	45	1492.1	0.0000	5.5550	ppb	1.17	3000.00	
78 Se	# 1	72	33.6	0.0000	0.2634	ppb	28.19	3000.00	
88 Sr	# 3	72	817976.4	0.0000	31.0700	ppb	0.52	3000.00	
89 Y	# 3	---	2729804.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	7240.2	0.0000	2.3830	ppb	3.08	3000.00	
107 Ag	# 3	115	19461.8	0.0000	3.0800	ppb	1.13	250.00	
111 Cd	# 3	115	3928.1	0.0000	1.9400	ppb	2.88	3000.00	
118 Sn	# 3	115	351855.2	0.0000	87.0900	ppb	0.43	3000.00	
121 Sb	# 3	115	40099.7	0.0000	8.0460	ppb	1.57	3000.00	
137 Ba	# 3	115	412179.2	0.0000	226.8000	ppb	0.87	3000.00	
205 Tl	# 3	209	1942.5	0.0000	0.2680	ppb	2.36	3000.00	
208 Pb	# 3	209	6303739.0	0.0000	682.6000	ppb	0.43	3000.00	
235 U	# 3	209	63.3	0.0000	0.0072	ppb	17.87	3000.00	
238 U	# 3	209	5591.6	0.0000	0.7444	ppb	2.47	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	447721.91	1.31	516131.41	86.7	60 - 125	
45 Sc # 1	408654.78	0.40	751121.75	54.4	60 - 125	ISFail
45 Sc # 2	73854.66	0.53	105116.80	70.3	60 - 125	
45 Sc # 3	1988486.00	1.09	2578760.50	77.1	60 - 125	
72 Ge # 1	109741.56	0.91	182569.23	60.1	60 - 125	
72 Ge # 2	48841.04	1.35	62725.95	77.9	60 - 125	
72 Ge # 3	487435.31	1.02	550487.25	88.5	60 - 125	
115 In # 3	1853794.50	0.92	3088381.00	60.0	60 - 125	
159 Tb # 3	1862607.30	0.63	2902786.50	64.2	60 - 125	
209 Bi # 3	805343.44	0.32	1175901.50	68.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30124.D\98L30124.D#
Date Acquired:	Dec 28 2006 06:27 am
Operator:	JEE
Sample Name:	CCV11
Misc Info:	
Vial Number:	1307
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.76	262070.20 ppb	0.92	45.00	90 - 110	
9 Be	42.27	71498.45 ppb	1.76	45.00	90 - 110	
11 B	42.52	47644.48 ppb	1.14	45.00	90 - 110	
23 Na	5280.00	4841179.00 ppb	0.69	4500.00	90 - 110	Fail
24 Mg	5107.00	32265610.00 ppb	0.50	4500.00	90 - 110	Fail
27 Al	5039.00	43111760.00 ppb	0.77	4500.00	90 - 110	Fail
39 K	4511.00	838068.38 ppb	0.62	4500.00	90 - 110	
40 Ca	4689.00	10843720.00 ppb	0.24	4500.00	90 - 110	
47 Ti	44.17	54271.23 ppb	1.21	45.00	90 - 110	
51 V	44.62	81421.27 ppb	0.34	45.00	90 - 110	
52 Cr	45.40	98086.89 ppb	0.29	45.00	90 - 110	
55 Mn	41.82	881273.69 ppb	0.25	45.00	90 - 110	
56 Fe	4556.00	14471430.00 ppb	0.34	4500.00	90 - 110	
59 Co	41.12	735462.88 ppb	0.58	45.00	90 - 110	
60 Ni	45.56	43722.60 ppb	0.48	45.00	90 - 110	
63 Cu	45.76	118358.70 ppb	0.78	45.00	90 - 110	
66 Zn	42.09	98565.43 ppb	0.25	45.00	90 - 110	
75 As	43.58	11302.17 ppb	1.02	45.00	90 - 110	
78 Se	45.91	4540.48 ppb	1.83	45.00	90 - 110	
88 Sr	40.95	864260.88 ppb	0.14	45.00	90 - 110	
89 Y	--------	2614356.00 ppb	--------	---	90 - 110	
95 Mo	45.85	142577.91 ppb	0.76	45.00	90 - 110	
107 Ag	45.52	294304.31 ppb	1.05	45.00	90 - 110	
111 Cd	44.30	66689.95 ppb	0.48	45.00	90 - 110	
118 Sn	43.80	182382.50 ppb	1.26	45.00	90 - 110	
121 Sb	43.30	220566.91 ppb	1.58	45.00	90 - 110	
137 Ba	45.01	84099.29 ppb	1.68	45.00	90 - 110	
205 Tl	46.55	325576.19 ppb	0.48	45.00	90 - 110	
208 Pb	47.28	438459.31 ppb	0.23	45.00	90 - 110	
235 U	0.33	2589.30 ppb	2.42	0.32	90 - 110	
238 U	46.92	350808.19 ppb	0.57	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	447234.38	1.49	516131.41	86.7	60 - 125	
45 Sc	399636.50	0.45	751121.75	53.2	60 - 125	ISFail
45 Sc	72203.34	0.65	105116.80	68.7	60 - 125	
45 Sc	1964805.40	0.75	2578760.50	76.2	60 - 125	
72 Ge	97659.21	0.48	182569.23	53.5	60 - 125	ISFail
72 Ge	42284.38	0.38	62725.95	67.4	60 - 125	
72 Ge	390941.34	0.94	550487.25	71.0	60 - 125	
115 In	1904920.10	0.55	3088381.00	61.7	60 - 125	
159 Tb	1896745.10	0.52	2902786.50	65.3	60 - 125	
209 Bi	805951.00	0.08	1175901.50	68.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30125.D\98L30125.D#
Date Acquired:	Dec 28 2006 06:36 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB11
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0583	31977.2 ppb	62.40	1.00	
9 Be	0.0108	41.1 ppb	26.91	1.00	
11 B	0.3963	3558.4 ppb	19.17	1.00	
23 Na	40.3500	176901.3 ppb	5.81	1.00	
24 Mg	2.9020	45929.0 ppb	0.77	1.00	
27 Al	2.3680	31620.0 ppb	0.84	1.00	
39 K	6.1490	13378.5 ppb	4.27	1.00	
40 Ca	5.7810	31576.0 ppb	1.82	1.00	
47 Ti	0.0378	151.1 ppb	24.83	1.00	
51 V	0.0253	824.3 ppb	30.29	1.00	
52 Cr	-0.0063	236.9 ppb	124.27	1.00	
55 Mn	0.0145	1401.2 ppb	5.24	1.00	
56 Fe	2.1140	13406.4 ppb	2.03	1.00	
59 Co	0.0109	293.3 ppb	20.42	1.00	
60 Ni	0.0087	39.1 ppb	34.09	1.00	
63 Cu	0.0014	295.6 ppb	775.77	1.00	
66 Zn	0.0489	1415.7 ppb	41.83	1.00	
75 As	0.0102	23.1 ppb	334.02	1.00	
78 Se	0.0328	6.7 ppb	40.37	1.00	
88 Sr	0.0361	1931.3 ppb	9.56	1.00	
89 Y	--------	2539313.0 ppb	--------	1.00	
95 Mo	0.0674	237.8 ppb	22.75	1.00	
107 Ag	0.0174	200.0 ppb	20.56	1.00	
111 Cd	-0.1214	972.2 ppb	3.73	1.00	
118 Sn	0.1126	1574.6 ppb	11.79	1.00	
121 Sb	0.3057	1800.2 ppb	10.74	1.00	
137 Ba	0.0177	90.0 ppb	34.37	1.00	
205 Tl	0.0519	426.7 ppb	8.90	1.00	
208 Pb	-0.0264	1352.3 ppb	18.39	1.00	
235 U	0.0001	7.8 ppb	696.91	1.00	
238 U	0.0203	180.0 ppb	20.46	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	453256.0	0.92	516131.41	87.8	60 - 125	
45 Sc	388172.3	1.37	751121.75	51.7	60 - 125	ISFail
45 Sc	70413.8	0.01	105116.80	67.0	60 - 125	
45 Sc	1906292.6	1.86	2578760.50	73.9	60 - 125	
72 Ge	92665.4	1.25	182569.23	50.8	60 - 125	ISFail
72 Ge	40665.8	0.42	62725.95	64.8	60 - 125	
72 Ge	365838.5	0.88	550487.25	66.5	60 - 125	
115 In	1877070.0	1.08	3088381.00	60.8	60 - 125	
159 Tb	1838073.8	0.39	2902786.50	63.3	60 - 125	
209 Bi	794475.4	0.10	1175901.50	67.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

Sample QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30126.D\98L30126.D#
Date Acquired:	Dec 28 2006 06:45 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	L280-14
Misc Info:	
Vial Number:	3504
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	73100.7	0.0000	7.4290	ppb	1.72	400.00	
9 Be	# 3	6	217.8	0.0000	0.1109	ppb	21.29	400.00	
11 B	# 3	6	5253.5	0.0000	1.8770	ppb	3.97	400.00	
23 Na	# 1	45	420718.3	0.0000	295.2000	ppb	0.65	300000.00	
24 Mg	# 3	45	27836770.0	0.0000	4191.0000	ppb	0.32	200000.00	
27 Al	# 3	45	52015592.0	0.0000	5785.0000	ppb	0.38	200000.00	
39 K	# 2	45	424714.1	0.0000	2192.0000	ppb	0.40	100000.00	
40 Ca	# 1	45	23944560.0	0.0000	10070.0000	ppb	0.53	300000.00	
47 Ti	# 3	45	1111128.0	0.0000	862.0000	ppb	0.66	3000.00	
51 V	# 2	45	45731.1	0.0000	24.2100	ppb	0.19	3000.00	
52 Cr	# 2	45	11173.5	0.0000	4.9320	ppb	0.78	3000.00	
55 Mn	# 3	45	2932007.0	0.0000	132.5000	ppb	0.11	3000.00	
56 Fe	# 1	45	31152130.0	0.0000	9530.0000	ppb	0.36	100000.00	
59 Co	# 3	45	49490.3	0.0000	2.6270	ppb	0.56	3000.00	
60 Ni	# 2	45	2299.6	0.0000	2.3020	ppb	1.04	3000.00	
63 Cu	# 2	45	17734.3	0.0000	6.5780	ppb	0.34	3000.00	
66 Zn	# 3	45	65678.8	0.0000	26.4700	ppb	0.88	3000.00	
75 As	# 2	45	301.8	0.0000	1.0540	ppb	7.84	3000.00	
78 Se	# 1	72	8.7	0.0000	0.0481	ppb	49.95	3000.00	
88 Sr	# 3	72	588236.9	0.0000	25.8900	ppb	0.55	3000.00	
89 Y	# 3	---	2826029.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	856.7	0.0000	0.2626	ppb	4.62	3000.00	
107 Ag	# 3	115	361.1	0.0000	0.0413	ppb	7.30	250.00	
111 Cd	# 3	115	1167.4	0.0000	-0.0076	ppb	722.99	3000.00	
118 Sn	# 3	115	17631.7	0.0000	3.9420	ppb	1.07	3000.00	
121 Sb	# 3	115	880.1	0.0000	0.1179	ppb	11.41	3000.00	
137 Ba	# 3	115	105090.2	0.0000	55.6600	ppb	1.15	3000.00	
205 Tl	# 3	209	1782.4	0.0000	0.2386	ppb	2.06	3000.00	
208 Pb	# 3	209	17859.6	0.0000	1.7100	ppb	1.09	3000.00	
235 U	# 3	209	26.7	0.0000	0.0025	ppb	33.58	3000.00	
238 U	# 3	209	3686.3	0.0000	0.4768	ppb	3.26	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	464175.25	0.30	516131.41	89.9	60 - 125	
45 Sc # 1	411369.34	0.74	751121.75	54.8	60 - 125	ISFail
45 Sc # 2	74131.95	0.05	105116.80	70.5	60 - 125	
45 Sc # 3	2065210.40	0.63	2578760.50	80.1	60 - 125	
72 Ge # 1	98999.62	0.68	182569.23	54.2	60 - 125	ISFail
72 Ge # 2	43276.48	0.89	62725.95	69.0	60 - 125	
72 Ge # 3	420535.03	0.72	550487.25	76.4	60 - 125	
115 In # 3	1924877.90	0.63	3088381.00	62.3	60 - 125	
159 Tb # 3	1911163.50	0.55	2902786.50	65.8	60 - 125	
209 Bi # 3	826535.88	0.34	1175901.50	70.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30127.D\98L30127.D#
Date Acquired: Dec 28 2006 06:53 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-15
Misc Info:
Vial Number: 3505
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	75441.1	0.0000	7.7460	ppb	1.93	400.00	
9 Be	# 3	6	283.3	0.0000	0.1471	ppb	5.05	400.00	
11 B	# 3	6	14218.1	0.0000	10.0200	ppb	0.87	400.00	
23 Na	# 1	45	1109222.0	0.0000	1000.0000	ppb	1.93	300000.00	
24 Mg	# 3	45	30721720.0	0.0000	4634.0000	ppb	0.45	200000.00	
27 Al	# 3	45	74925072.0	0.0000	8346.0000	ppb	0.73	200000.00	
39 K	# 2	45	644814.8	0.0000	3373.0000	ppb	0.05	100000.00	
40 Ca	# 1	45	17064840.0	0.0000	6893.0000	ppb	1.10	300000.00	
47 Ti	# 3	45	1169866.0	0.0000	909.0000	ppb	0.72	3000.00	
51 V	# 2	45	59845.0	0.0000	31.9100	ppb	0.11	3000.00	
52 Cr	# 2	45	41332.0	0.0000	18.6200	ppb	0.11	3000.00	
55 Mn	# 3	45	21389220.0	0.0000	968.4000	ppb	0.28	3000.00	
56 Fe	# 1	45	67628832.0	0.0000	19880.0000	ppb	0.64	100000.00	
59 Co	# 3	45	105989.8	0.0000	5.6420	ppb	0.72	3000.00	
60 Ni	# 2	45	16083.0	0.0000	16.3500	ppb	0.41	3000.00	
63 Cu	# 2	45	883769.9	0.0000	334.5000	ppb	0.03	3000.00	
66 Zn	# 3	45	2950508.0	0.0000	1217.0000	ppb	0.73	3000.00	
75 As	# 2	45	1174.7	0.0000	4.3520	ppb	2.56	3000.00	
78 Se	# 1	72	24.4	0.0000	0.1860	ppb	16.24	3000.00	
88 Sr	# 3	72	784802.8	0.0000	31.9500	ppb	0.56	3000.00	
89 Y	# 3	---	2770814.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	4830.0	0.0000	1.5610	ppb	1.39	3000.00	
107 Ag	# 3	115	11345.7	0.0000	1.7610	ppb	0.89	250.00	
111 Cd	# 3	115	2549.3	0.0000	0.9547	ppb	4.32	3000.00	
118 Sn	# 3	115	151966.2	0.0000	36.8600	ppb	0.53	3000.00	
121 Sb	# 3	115	43978.2	0.0000	8.6880	ppb	0.98	3000.00	
137 Ba	# 3	115	341184.4	0.0000	184.7000	ppb	0.56	3000.00	
205 Tl	# 3	209	1628.0	0.0000	0.2206	ppb	3.85	3000.00	
208 Pb	# 3	209	2571772.0	0.0000	275.6000	ppb	0.59	3000.00	
235 U	# 3	209	40.0	0.0000	0.0042	ppb	9.57	3000.00	
238 U	# 3	209	4747.8	0.0000	0.6250	ppb	1.05	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	467880.09	1.51	516131.41	90.7	60 - 125	
45 Sc # 1	428107.22	1.04	751121.75	57.0	60 - 125	ISFail
45 Sc # 2	73908.76	0.11	105116.80	70.3	60 - 125	
45 Sc # 3	2061954.50	1.21	2578760.50	80.0	60 - 125	
72 Ge # 1	107628.36	0.47	182569.23	59.0	60 - 125	ISFail
72 Ge # 2	45911.40	0.74	62725.95	73.2	60 - 125	
72 Ge # 3	454794.88	1.99	550487.25	82.6	60 - 125	
115 In # 3	1883462.30	0.44	3088381.00	61.0	60 - 125	
159 Tb # 3	1905107.50	1.34	2902786.50	65.6	60 - 125	
209 Bi # 3	813654.13	0.43	1175901.50	69.2	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30128.D\98L30128.D#
Date Acquired:	Dec 28 2006 07:02 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	L280-16
Misc Info:	
Vial Number:	3506
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	51021.1	0.0000	3.1830	ppb	0.42	400.00	
9 Be	# 3	6	133.3	0.0000	0.0611	ppb	39.66	400.00	
11 B	# 3	6	4655.4	0.0000	1.2290	ppb	3.58	400.00	
23 Na	# 1	45	316358.6	0.0000	182.6000	ppb	2.89	300000.00	
24 Mg	# 3	45	11204450.0	0.0000	1708.0000	ppb	0.95	200000.00	
27 Al	# 3	45	29172150.0	0.0000	3289.0000	ppb	0.92	200000.00	
39 K	# 2	45	302831.9	0.0000	1546.0000	ppb	1.04	100000.00	
40 Ca	# 1	45	1671826.0	0.0000	698.3000	ppb	0.45	300000.00	
47 Ti	# 3	45	741716.0	0.0000	583.4000	ppb	1.20	3000.00	
51 V	# 2	45	37246.1	0.0000	19.6800	ppb	0.47	3000.00	
52 Cr	# 2	45	10641.3	0.0000	4.7010	ppb	0.71	3000.00	
55 Mn	# 3	45	1855173.0	0.0000	84.9800	ppb	1.25	3000.00	
56 Fe	# 1	45	24239600.0	0.0000	7446.0000	ppb	0.45	100000.00	
59 Co	# 3	45	41672.7	0.0000	2.2420	ppb	1.54	3000.00	
60 Ni	# 2	45	2195.8	0.0000	2.2020	ppb	1.20	3000.00	
63 Cu	# 2	45	26635.1	0.0000	9.9600	ppb	0.24	3000.00	
66 Zn	# 3	45	163872.0	0.0000	67.8600	ppb	1.26	3000.00	
75 As	# 2	45	244.9	0.0000	0.8421	ppb	2.01	3000.00	
78 Se	# 1	72	9.8	0.0000	0.0590	ppb	42.97	3000.00	
88 Sr	# 3	72	109711.4	0.0000	4.8690	ppb	0.52	3000.00	
89 Y	# 3	---	2715390.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	994.5	0.0000	0.3075	ppb	4.31	3000.00	
107 Ag	# 3	115	645.6	0.0000	0.0851	ppb	20.25	250.00	
111 Cd	# 3	115	1080.2	0.0000	-0.0635	ppb	39.04	3000.00	
118 Sn	# 3	115	33033.3	0.0000	7.6500	ppb	0.53	3000.00	
121 Sb	# 3	115	1885.8	0.0000	0.3146	ppb	6.66	3000.00	
137 Ba	# 3	115	72082.9	0.0000	38.2900	ppb	1.22	3000.00	
205 Tl	# 3	209	924.5	0.0000	0.1202	ppb	5.40	3000.00	
208 Pb	# 3	209	128952.8	0.0000	13.5700	ppb	0.18	3000.00	
235 U	# 3	209	23.3	0.0000	0.0021	ppb	40.73	3000.00	
238 U	# 3	209	2736.0	0.0000	0.3562	ppb	0.36	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	475026.59	0.52	516131.41	92.0	60 - 125	
45 Sc # 1	409623.50	0.47	751121.75	54.5	60 - 125	ISFail
45 Sc # 2	73974.41	0.41	105116.80	70.4	60 - 125	
45 Sc # 3	2036885.00	0.94	2578760.50	79.0	60 - 125	
72 Ge # 1	99171.52	0.39	182569.23	54.3	60 - 125	ISFail
72 Ge # 2	42901.86	0.71	62725.95	68.4	60 - 125	
72 Ge # 3	412785.19	0.98	550487.25	75.0	60 - 125	
115 In # 3	1918835.60	0.56	3088381.00	62.1	60 - 125	
159 Tb # 3	1879948.10	0.80	2902786.50	64.8	60 - 125	
209 Bi # 3	818699.31	0.38	1175901.50	69.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30129.D\98L30129.D#
Date Acquired: Dec 28 2006 07:10 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-17
Misc Info:
Vial Number: 3507
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	80248.2	0.0000	8.7960	ppb	0.96	400.00	
9 Be	# 3	6	356.7	0.0000	0.1911	ppb	14.31	400.00	
11 B	# 3	6	5857.1	0.0000	2.4540	ppb	6.34	400.00	
23 Na	# 1	45	761521.5	0.0000	620.3000	ppb	0.46	300000.00	
24 Mg	# 3	45	34626040.0	0.0000	5240.0000	ppb	0.03	200000.00	
27 Al	# 3	45	94871648.0	0.0000	10600.0000	ppb	0.56	200000.00	
39 K	# 2	45	828301.1	0.0000	4279.0000	ppb	0.46	100000.00	
40 Ca	# 1	45	11310950.0	0.0000	4482.0000	ppb	0.49	300000.00	
47 Ti	# 3	45	1575064.0	0.0000	1228.0000	ppb	0.21	3000.00	
51 V	# 2	45	75351.2	0.0000	39.6200	ppb	0.33	3000.00	
52 Cr	# 2	45	32425.5	0.0000	14.3400	ppb	0.38	3000.00	
55 Mn	# 3	45	4785895.0	0.0000	217.4000	ppb	0.68	3000.00	
56 Fe	# 1	45	49455792.0	0.0000	14270.0000	ppb	0.41	100000.00	
59 Co	# 3	45	97955.8	0.0000	5.2310	ppb	0.49	3000.00	
60 Ni	# 2	45	6230.7	0.0000	6.2090	ppb	1.63	3000.00	
63 Cu	# 2	45	36190.4	0.0000	13.3600	ppb	1.25	3000.00	
66 Zn	# 3	45	117370.6	0.0000	48.0100	ppb	1.37	3000.00	
75 As	# 2	45	460.9	0.0000	1.6290	ppb	3.26	3000.00	
78 Se	# 1	72	23.3	0.0000	0.1789	ppb	3.58	3000.00	
88 Sr	# 3	72	554870.1	0.0000	23.4500	ppb	0.62	3000.00	
89 Y	# 3	---	2798680.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1899.1	0.0000	0.5993	ppb	0.94	3000.00	
107 Ag	# 3	115	625.6	0.0000	0.0826	ppb	9.72	250.00	
111 Cd	# 3	115	1415.7	0.0000	0.1669	ppb	26.56	3000.00	
118 Sn	# 3	115	23062.4	0.0000	5.2870	ppb	1.01	3000.00	
121 Sb	# 3	115	784.5	0.0000	0.1004	ppb	6.72	3000.00	
137 Ba	# 3	115	237489.8	0.0000	126.9000	ppb	0.80	3000.00	
205 Tl	# 3	209	1958.0	0.0000	0.2686	ppb	5.39	3000.00	
208 Pb	# 3	209	73510.0	0.0000	7.7410	ppb	1.07	3000.00	
235 U	# 3	209	50.0	0.0000	0.0055	ppb	20.20	3000.00	
238 U	# 3	209	5501.5	0.0000	0.7281	ppb	1.12	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	462233.16	0.99	516131.41	89.6	60 - 125	
45 Sc # 1	436130.69	0.50	751121.75	58.1	60 - 125	ISFail
45 Sc # 2	75159.04	0.51	105116.80	71.5	60 - 125	
45 Sc # 3	2055199.80	1.37	2578760.50	79.7	60 - 125	
72 Ge # 1	106103.41	0.78	182569.23	58.1	60 - 125	ISFail
72 Ge # 2	45103.91	0.75	62725.95	71.9	60 - 125	
72 Ge # 3	437862.34	0.73	550487.25	79.5	60 - 125	
115 In # 3	1909170.40	1.15	3088381.00	61.8	60 - 125	
159 Tb # 3	1907200.60	0.72	2902786.50	65.7	60 - 125	
209 Bi # 3	810069.50	0.32	1175901.50	68.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30130.D\98L30130.D#
Date Acquired: Dec 28 2006 07:19 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-18
Misc Info:
Vial Number: 3508
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	79004.1	0.0000	8.5560	ppb	1.22	400.00	
9 Be	# 3	6	247.8	0.0000	0.1284	ppb	10.97	400.00	
11 B	# 3	6	10890.4	0.0000	7.0950	ppb	0.77	400.00	
23 Na	# 1	45	637092.3	0.0000	514.7000	ppb	1.27	300000.00	
24 Mg	# 3	45	29675750.0	0.0000	4515.0000	ppb	1.51	200000.00	
27 Al	# 3	45	75773504.0	0.0000	8514.0000	ppb	1.23	200000.00	
39 K	# 2	45	577370.0	0.0000	3001.0000	ppb	0.75	100000.00	
40 Ca	# 1	45	14636420.0	0.0000	6003.0000	ppb	0.77	300000.00	
47 Ti	# 3	45	1204469.0	0.0000	944.0000	ppb	1.10	3000.00	
51 V	# 2	45	58828.0	0.0000	31.2400	ppb	0.82	3000.00	
52 Cr	# 2	45	44030.9	0.0000	19.7600	ppb	0.62	3000.00	
55 Mn	# 3	45	40311648.0	0.0000	1841.0000	ppb	1.10	3000.00	
56 Fe	# 1	45	101167300.0	0.0000	30200.0000	ppb	0.37	100000.00	
59 Co	# 3	45	163511.9	0.0000	8.7830	ppb	0.98	3000.00	
60 Ni	# 2	45	20131.1	0.0000	20.3900	ppb	0.69	3000.00	
63 Cu	# 2	45	845101.8	0.0000	318.6000	ppb	0.96	3000.00	
66 Zn	# 3	45	4857451.0	0.0000	2021.0000	ppb	0.56	3000.00	
75 As	# 2	45	1903.7	0.0000	7.0750	ppb	1.97	3000.00	
78 Se	# 1	72	23.6	0.0000	0.1717	ppb	16.28	3000.00	
88 Sr	# 3	72	810655.6	0.0000	30.2700	ppb	1.00	3000.00	
89 Y	# 3	---	2804139.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	7562.6	0.0000	2.4310	ppb	2.26	3000.00	
107 Ag	# 3	115	13290.0	0.0000	2.0490	ppb	1.50	250.00	
111 Cd	# 3	115	4023.1	0.0000	1.9410	ppb	3.74	3000.00	
118 Sn	# 3	115	292959.9	0.0000	70.7600	ppb	0.68	3000.00	
121 Sb	# 3	115	42344.7	0.0000	8.2980	ppb	0.80	3000.00	
137 Ba	# 3	115	457971.8	0.0000	246.1000	ppb	0.11	3000.00	
205 Tl	# 3	209	1855.8	0.0000	0.2544	ppb	6.39	3000.00	
208 Pb	# 3	209	4735255.0	0.0000	510.4000	ppb	0.24	3000.00	
235 U	# 3	209	40.0	0.0000	0.0042	ppb	30.36	3000.00	
238 U	# 3	209	4801.2	0.0000	0.6357	ppb	4.89	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	462581.28	0.95	516131.41	89.6	60 - 125	
45 Sc # 1	421574.03	0.68	751121.75	56.1	60 - 125	ISFail
45 Sc # 2	74208.18	0.99	105116.80	70.6	60 - 125	
45 Sc # 3	2044460.80	1.88	2578760.50	79.3	60 - 125	
72 Ge # 1	110793.15	1.20	182569.23	60.7	60 - 125	
72 Ge # 2	49074.15	0.99	62725.95	78.2	60 - 125	
72 Ge # 3	495927.34	1.55	550487.25	90.1	60 - 125	
115 In # 3	1898335.80	0.44	3088381.00	61.5	60 - 125	
159 Tb # 3	1907822.50	0.76	2902786.50	65.7	60 - 125	
209 Bi # 3	809109.19	0.19	1175901.50	68.8	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7110

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30131.D\98L30131.D#
Date Acquired: Dec 28 2006 07:28 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-19
Misc Info:
Vial Number: 3509
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	47949.7	0.0000	2.6510	ppb	5.18	400.00	
9 Be	# 3	6	80.0	0.0000	0.0315	ppb	13.22	400.00	
11 B	# 3	6	4179.7	0.0000	0.8095	ppb	9.47	400.00	
23 Na	# 1	45	286610.8	0.0000	148.2000	ppb	1.72	300000.00	
24 Mg	# 3	45	8327953.0	0.0000	1272.0000	ppb	0.14	200000.00	
27 Al	# 3	45	22740830.0	0.0000	2570.0000	ppb	0.65	200000.00	
39 K	# 2	45	224498.2	0.0000	1143.0000	ppb	2.39	100000.00	
40 Ca	# 1	45	1222414.0	0.0000	505.4000	ppb	0.36	300000.00	
47 Ti	# 3	45	568410.8	0.0000	448.3000	ppb	0.63	3000.00	
51 V	# 2	45	29147.6	0.0000	15.4900	ppb	1.28	3000.00	
52 Cr	# 2	45	7675.2	0.0000	3.3990	ppb	1.81	3000.00	
55 Mn	# 3	45	931807.2	0.0000	42.7800	ppb	0.69	3000.00	
56 Fe	# 1	45	17145280.0	0.0000	5237.0000	ppb	0.93	100000.00	
59 Co	# 3	45	27924.4	0.0000	1.5040	ppb	0.87	3000.00	
60 Ni	# 2	45	1556.3	0.0000	1.5690	ppb	1.53	3000.00	
63 Cu	# 2	45	17798.6	0.0000	6.6970	ppb	2.08	3000.00	
66 Zn	# 3	45	175968.0	0.0000	73.1200	ppb	1.17	3000.00	
75 As	# 2	45	182.0	0.0000	0.6131	ppb	2.68	3000.00	
78 Se	# 1	72	6.2	0.0000	0.0243	ppb	41.44	3000.00	
88 Sr	# 3	72	78103.7	0.0000	3.4950	ppb	1.55	3000.00	
89 Y	# 3	---	2721915.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	803.4	0.0000	0.2426	ppb	3.04	3000.00	
107 Ag	# 3	115	411.1	0.0000	0.0482	ppb	23.21	250.00	
111 Cd	# 3	115	1051.0	0.0000	-0.0934	ppb	83.86	3000.00	
118 Sn	# 3	115	21694.3	0.0000	4.8540	ppb	0.91	3000.00	
121 Sb	# 3	115	1261.2	0.0000	0.1891	ppb	3.86	3000.00	
137 Ba	# 3	115	51574.6	0.0000	26.9900	ppb	0.81	3000.00	
205 Tl	# 3	209	723.4	0.0000	0.0907	ppb	4.70	3000.00	
208 Pb	# 3	209	13332.5	0.0000	1.2300	ppb	1.88	3000.00	
235 U	# 3	209	23.3	0.0000	0.0020	ppb	73.86	3000.00	
238 U	# 3	209	2540.4	0.0000	0.3268	ppb	1.42	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	474083.53	1.03	516131.41	91.9	60 - 125	
45 Sc # 1	411963.28	1.10	751121.75	54.8	60 - 125	ISFail
45 Sc # 2	73125.97	2.05	105116.80	69.6	60 - 125	
45 Sc # 3	2031202.90	1.30	2578760.50	78.8	60 - 125	
72 Ge # 1	97963.06	0.39	182569.23	53.7	60 - 125	ISFail
72 Ge # 2	42641.06	0.66	62725.95	68.0	60 - 125	
72 Ge # 3	407356.25	1.04	550487.25	74.0	60 - 125	
115 In # 3	1947394.80	0.43	3088381.00	63.1	60 - 125	
159 Tb # 3	1918059.80	0.69	2902786.50	66.1	60 - 125	
209 Bi # 3	827830.31	0.02	1175901.50	70.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

F111

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30132.D\98L30132.D#
Date Acquired: Dec 28 2006 07:37 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-20
Misc Info:
Vial Number: 3510
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	76242.5	0.0000	7.6580	ppb	1.18	400.00	
9 Be	# 3	6	252.2	0.0000	0.1271	ppb	14.47	400.00	
11 B	# 3	6	20854.9	0.0000	15.7500	ppb	1.81	400.00	
23 Na	# 1	45	1159663.0	0.0000	1031.0000	ppb	1.17	300000.00	
24 Mg	# 3	45	40369620.0	0.0000	6103.0000	ppb	0.82	200000.00	
27 Al	# 3	45	83089072.0	0.0000	9275.0000	ppb	0.73	200000.00	
39 K	# 2	45	502144.7	0.0000	2644.0000	ppb	0.37	100000.00	
40 Ca	# 1	45	134591810.0	0.0000	53450.0000	ppb	0.23	300000.00	
47 Ti	# 3	45	1123750.0	0.0000	875.1000	ppb	0.51	3000.00	
51 V	# 2	45	52723.1	0.0000	28.4100	ppb	1.13	3000.00	
52 Cr	# 2	45	79311.1	0.0000	36.2800	ppb	1.32	3000.00	
55 Mn	# 3	45	30724170.0	0.0000	1394.0000	ppb	0.83	3000.00	
56 Fe	# 1	45	145215010.0	0.0000	41930.0000	ppb	0.46	100000.00	
59 Co	# 3	45	180263.0	0.0000	9.6210	ppb	0.74	3000.00	
60 Ni	# 2	45	58507.7	0.0000	60.2900	ppb	0.65	3000.00	
63 Cu	# 2	45	2233168.0	0.0000	855.7000	ppb	0.74	3000.00	
66 Zn	# 3	45	5658233.0	0.0000	2339.0000	ppb	0.87	3000.00	
75 As	# 2	45	2130.2	0.0000	8.0560	ppb	0.23	3000.00	
78 Se	# 1	72	66.7	0.0000	0.5145	ppb	12.32	3000.00	
88 Sr	# 3	72	5411493.0	0.0000	187.6000	ppb	1.79	3000.00	
89 Y	# 3	---	2810942.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	15360.1	0.0000	4.9970	ppb	1.93	3000.00	
107 Ag	# 3	115	39634.2	0.0000	6.2010	ppb	0.93	250.00	
111 Cd	# 3	115	14400.2	0.0000	9.0790	ppb	0.49	3000.00	
118 Sn	# 3	115	764123.2	0.0000	186.9000	ppb	0.76	3000.00	
121 Sb	# 3	115	134440.9	0.0000	26.7300	ppb	1.25	3000.00	
137 Ba	# 3	115	707417.5	0.0000	384.0000	ppb	0.91	3000.00	
205 Tl	# 3	209	2065.8	0.0000	0.2820	ppb	1.55	3000.00	
208 Pb	# 3	209	12077950.0	0.0000	1292.0000	ppb	0.35	3000.00	
235 U	# 3	209	60.0	0.0000	0.0067	ppb	16.21	3000.00	
238 U	# 3	209	7555.0	0.0000	0.9947	ppb	2.58	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	475948.63	1.16	516131.41	92.2	60 - 125	
45 Sc # 1	435878.66	0.30	751121.75	58.0	60 - 125	ISFail
45 Sc # 2	73024.63	0.74	105116.80	69.5	60 - 125	
45 Sc # 3	2057508.30	1.25	2578760.50	79.8	60 - 125	
72 Ge # 1	119171.30	0.42	182569.23	65.3	60 - 125	
72 Ge # 2	49872.83	1.29	62725.95	79.5	60 - 125	
72 Ge # 3	535174.25	2.28	550487.25	97.2	60 - 125	
115 In # 3	1879444.80	1.20	3088381.00	60.9	60 - 125	
159 Tb # 3	1866756.90	0.38	2902786.50	64.3	60 - 125	
209 Bi # 3	815533.56	0.47	1175901.50	69.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
1 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7112

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30133.D\98L30133.D#
Date Acquired: Dec 28 2006 07:45 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-21A
Misc Info:
Vial Number: 3511
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	320958.9	0.0000	52.1300	ppb	0.65	400.00	
9 Be	# 3	6	80682.0	0.0000	45.5000	ppb	0.71	400.00	
11 B	# 3	6	56334.2	0.0000	48.3400	ppb	0.19	400.00	
23 Na	# 1	45	5968042.0	0.0000	6061.0000	ppb	0.32	300000.00	
24 Mg	# 3	45	52136272.0	0.0000	7973.0000	ppb	1.14	200000.00	
27 Al	# 3	45	85036384.0	0.0000	9600.0000	ppb	0.87	200000.00	
39 K	# 2	45	1348985.0	0.0000	7290.0000	ppb	0.56	100000.00	
40 Ca	# 1	45	14641260.0	0.0000	5875.0000	ppb	0.20	300000.00	
47 Ti	# 3	45	1114839.0	0.0000	877.9000	ppb	0.65	3000.00	
51 V	# 2	45	139301.0	0.0000	76.5300	ppb	0.66	3000.00	
52 Cr	# 2	45	119232.8	0.0000	55.1300	ppb	0.38	3000.00	
55 Mn	# 3	45	2617771.0	0.0000	120.1000	ppb	0.50	3000.00	
56 Fe	# 1	45	42998740.0	0.0000	12560.0000	ppb	0.60	100000.00	
59 Co	# 3	45	868870.0	0.0000	46.9200	ppb	0.67	3000.00	
60 Ni	# 2	45	49373.9	0.0000	51.3700	ppb	0.49	3000.00	
63 Cu	# 2	45	140202.4	0.0000	54.1300	ppb	0.59	3000.00	
66 Zn	# 3	45	147190.4	0.0000	60.9600	ppb	0.90	3000.00	
75 As	# 2	45	12051.3	0.0000	46.4000	ppb	0.26	3000.00	
78 Se	# 1	72	4859.3	0.0000	47.4800	ppb	1.55	3000.00	
88 Sr	# 3	72	1186595.0	0.0000	51.3300	ppb	0.85	3000.00	
89 Y	# 3	---	2676727.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	158833.4	0.0000	50.8800	ppb	0.72	3000.00	
107 Ag	# 3	115	321104.9	0.0000	49.4700	ppb	0.96	250.00	
111 Cd	# 3	115	72179.0	0.0000	47.8200	ppb	0.44	3000.00	
118 Sn	# 3	115	217037.7	0.0000	51.9700	ppb	0.95	3000.00	
121 Sb	# 3	115	241728.6	0.0000	47.2800	ppb	1.40	3000.00	
137 Ba	# 3	115	169895.3	0.0000	90.6200	ppb	2.01	3000.00	
205 Tl	# 3	209	345926.9	0.0000	50.8400	ppb	0.44	3000.00	
208 Pb	# 3	209	499390.3	0.0000	55.3800	ppb	0.45	3000.00	
235 U	# 3	209	2986.1	0.0000	0.3927	ppb	0.78	3000.00	
238 U	# 3	209	384006.8	0.0000	52.7900	ppb	0.80	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	468759.09	1.64	516131.41	90.8	60 - 125	
45 Sc # 1	430856.22	0.26	751121.75	57.4	60 - 125	ISFail
45 Sc # 2	72321.91	0.57	105116.80	68.8	60 - 125	
45 Sc # 3	2034454.50	0.62	2578760.50	78.9	60 - 125	
72 Ge # 1	101052.66	0.51	182569.23	55.4	60 - 125	ISFail
72 Ge # 2	43094.77	1.21	62725.95	68.7	60 - 125	
72 Ge # 3	428327.53	1.10	550487.25	77.9	60 - 125	
115 In # 3	1912320.40	1.64	3088381.00	61.9	60 - 125	
159 Tb # 3	1811197.00	1.16	2902786.50	62.4	60 - 125	
209 Bi # 3	784150.19	0.48	1175901.50	66.7	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

T113

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30134.D\98L30134.D#
Date Acquired: Dec 28 2006 07:54 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-21
Misc Info:
Vial Number: 3512
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	57323.5	0.0000	4.4380	ppb	2.69	400.00	
9 Be	# 3	6	122.2	0.0000	0.0556	ppb	58.64	400.00	
11 B	# 3	6	4512.0	0.0000	1.1510	ppb	7.32	400.00	
23 Na	# 1	45	318243.7	0.0000	186.9000	ppb	1.14	300000.00	
24 Mg	# 3	45	15372340.0	0.0000	2384.0000	ppb	0.60	200000.00	
27 Al	# 3	45	35624460.0	0.0000	4083.0000	ppb	0.60	200000.00	
39 K	# 2	45	400187.9	0.0000	2129.0000	ppb	0.73	100000.00	
40 Ca	# 1	45	1799408.0	0.0000	757.0000	ppb	1.18	300000.00	
47 Ti	# 3	45	1033375.0	0.0000	826.3000	ppb	0.64	3000.00	
51 V	# 2	45	49985.5	0.0000	27.3700	ppb	1.57	3000.00	
52 Cr	# 2	45	11598.6	0.0000	5.2920	ppb	1.22	3000.00	
55 Mn	# 3	45	1561515.0	0.0000	72.7100	ppb	0.41	3000.00	
56 Fe	# 1	45	25105100.0	0.0000	7761.0000	ppb	1.55	100000.00	
59 Co	# 3	45	50643.8	0.0000	2.7710	ppb	0.11	3000.00	
60 Ni	# 2	45	1954.6	0.0000	2.0160	ppb	3.28	3000.00	
63 Cu	# 2	45	13210.6	0.0000	5.0310	ppb	2.74	3000.00	
66 Zn	# 3	45	41143.6	0.0000	16.8900	ppb	2.39	3000.00	
75 As	# 2	45	198.7	0.0000	0.6904	ppb	5.21	3000.00	
78 Se	# 1	72	9.8	0.0000	0.0636	ppb	27.37	3000.00	
88 Sr	# 3	72	128132.6	0.0000	5.7700	ppb	1.03	3000.00	
89 Y	# 3	---	2680750.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	909.0	0.0000	0.2860	ppb	3.83	3000.00	
107 Ag	# 3	115	295.6	0.0000	0.0323	ppb	14.22	250.00	
111 Cd	# 3	115	1076.6	0.0000	-0.0511	ppb	75.98	3000.00	
118 Sn	# 3	115	19360.2	0.0000	4.4660	ppb	1.83	3000.00	
121 Sb	# 3	115	807.8	0.0000	0.1075	ppb	1.77	3000.00	
137 Ba	# 3	115	80627.2	0.0000	43.7100	ppb	0.42	3000.00	
205 Tl	# 3	209	2323.7	0.0000	0.3249	ppb	6.08	3000.00	
208 Pb	# 3	209	29783.1	0.0000	3.0730	ppb	0.09	3000.00	
235 U	# 3	209	25.6	0.0000	0.0024	ppb	26.84	3000.00	
238 U	# 3	209	2312.6	0.0000	0.3076	ppb	7.83	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	469040.50	0.78	516131.41	90.9	60 - 125	
45 Sc # 1	407067.06	0.31	751121.75	54.2	60 - 125	ISFail
45 Sc # 2	71834.76	1.14	105116.80	68.3	60 - 125	
45 Sc # 3	2003577.90	1.08	2578760.50	77.7	60 - 125	
72 Ge # 1	94693.63	1.59	182569.23	51.9	60 - 125	ISFail
72 Ge # 2	42310.01	1.14	62725.95	67.5	60 - 125	
72 Ge # 3	407623.47	0.89	550487.25	74.0	60 - 125	
115 In # 3	1880444.40	0.68	3088381.00	60.9	60 - 125	
159 Tb # 3	1850936.90	0.71	2902786.50	63.8	60 - 125	
209 Bi # 3	799840.56	0.29	1175901.50	68.0	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7114

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30135.D\98L30135.D#
Date Acquired: Dec 28 2006 08:02 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-21J
Misc Info:
Vial Number: 4101
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	38073.2	0.0000	0.9418	ppb	6.75	400.00	
9 Be	# 3	6	53.3	0.0000	0.0168	ppb	86.56	400.00	
11 B	# 3	6	3445.0	0.0000	0.1727	ppb	42.24	400.00	
23 Na	# 1	45	212047.8	0.0000	66.2200	ppb	2.08	300000.00	
24 Mg	# 3	45	3256943.0	0.0000	504.3000	ppb	0.46	200000.00	
27 Al	# 3	45	7392618.0	0.0000	851.0000	ppb	0.55	200000.00	
39 K	# 2	45	92237.3	0.0000	437.6000	ppb	1.78	100000.00	
40 Ca	# 1	45	463857.9	0.0000	186.1000	ppb	0.81	300000.00	
47 Ti	# 3	45	203725.7	0.0000	163.8000	ppb	0.38	3000.00	
51 V	# 2	45	11054.8	0.0000	5.7050	ppb	1.52	3000.00	
52 Cr	# 2	45	2610.5	0.0000	1.0980	ppb	2.13	3000.00	
55 Mn	# 3	45	309884.7	0.0000	14.4700	ppb	0.62	3000.00	
56 Fe	# 1	45	5412252.0	0.0000	1647.0000	ppb	0.24	100000.00	
59 Co	# 3	45	10663.7	0.0000	0.5822	ppb	1.26	3000.00	
60 Ni	# 2	45	490.9	0.0000	0.4812	ppb	0.84	3000.00	
63 Cu	# 2	45	3322.2	0.0000	1.1780	ppb	1.63	3000.00	
66 Zn	# 3	45	13942.5	0.0000	5.3710	ppb	2.20	3000.00	
75 As	# 2	45	61.1	0.0000	0.1559	ppb	14.00	3000.00	
78 Se	# 1	72	3.8	0.0000	0.0004	ppb	5264.80	3000.00	
88 Sr	# 3	72	28144.5	0.0000	1.2750	ppb	0.94	3000.00	
89 Y	# 3	---	2681729.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	221.1	0.0000	0.0593	ppb	10.45	3000.00	
107 Ag	# 3	115	112.2	0.0000	0.0029	ppb	176.48	250.00	
111 Cd	# 3	115	1090.0	0.0000	-0.0693	ppb	15.47	3000.00	
118 Sn	# 3	115	5364.8	0.0000	0.9913	ppb	1.55	3000.00	
121 Sb	# 3	115	315.6	0.0000	0.0072	ppb	126.11	3000.00	
137 Ba	# 3	115	17231.3	0.0000	8.9750	ppb	2.04	3000.00	
205 Tl	# 3	209	734.5	0.0000	0.0941	ppb	6.58	3000.00	
208 Pb	# 3	209	7171.2	0.0000	0.5945	ppb	2.08	3000.00	
235 U	# 3	209	10.0	0.0000	0.0004	ppb	187.66	3000.00	
238 U	# 3	209	498.9	0.0000	0.0621	ppb	7.75	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	470204.78	0.85	516131.41	91.1	60 - 125	
45 Sc # 1	413079.88	0.40	751121.75	55.0	60 - 125	ISFail
45 Sc # 2	71865.02	0.98	105116.80	68.4	60 - 125	
45 Sc # 3	1992244.40	1.15	2578760.50	77.3	60 - 125	
72 Ge # 1	96176.41	0.47	182569.23	52.7	60 - 125	ISFail
72 Ge # 2	41755.93	1.24	62725.95	66.6	60 - 125	
72 Ge # 3	390541.56	0.88	550487.25	70.9	60 - 125	
115 In # 3	1952138.80	1.34	3088381.00	63.2	60 - 125	
159 Tb # 3	1888086.60	1.13	2902786.50	65.0	60 - 125	
209 Bi # 3	813050.56	0.43	1175901.50	69.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30136.D\98L30136.D#
Date Acquired:	Dec 28 2006 08:11 am
Operator:	JEE
Sample Name:	CCV12
Misc Info:	
Vial Number:	1307
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	43.52	266613.69 ppb	0.62	45.00	90 - 110	
9 Be	42.02	72655.90 ppb	0.16	45.00	90 - 110	
11 B	41.54	47646.65 ppb	1.68	45.00	90 - 110	
23 Na	5254.00	5039874.00 ppb	0.52	4500.00	90 - 110	Fail
24 Mg	5140.00	32646860.00 ppb	0.60	4500.00	90 - 110	Fail
27 Al	5053.00	43473320.00 ppb	0.64	4500.00	90 - 110	Fail
39 K	4486.00	823133.31 ppb	0.87	4500.00	90 - 110	
40 Ca	4656.00	11262120.00 ppb	0.80	4500.00	90 - 110	
47 Ti	43.98	54334.63 ppb	1.38	45.00	90 - 110	
51 V	44.98	81048.26 ppb	0.84	45.00	90 - 110	
52 Cr	45.67	97432.31 ppb	0.72	45.00	90 - 110	
55 Mn	42.10	891970.63 ppb	1.35	45.00	90 - 110	
56 Fe	4502.00	14961410.00 ppb	0.62	4500.00	90 - 110	
59 Co	41.20	740915.69 ppb	1.12	45.00	90 - 110	
60 Ni	46.06	43650.98 ppb	0.90	45.00	90 - 110	
63 Cu	46.14	117868.20 ppb	1.20	45.00	90 - 110	
66 Zn	42.55	100147.40 ppb	1.68	45.00	90 - 110	
75 As	43.63	11172.50 ppb	0.09	45.00	90 - 110	
78 Se	46.55	4653.19 ppb	1.45	45.00	90 - 110	
88 Sr	40.98	874496.31 ppb	0.47	45.00	90 - 110	
89 Y	--------	2635714.00 ppb	--------	---	90 - 110	
95 Mo	45.61	143851.50 ppb	0.36	45.00	90 - 110	
107 Ag	44.92	294558.69 ppb	0.78	45.00	90 - 110	
111 Cd	43.71	66744.28 ppb	0.36	45.00	90 - 110	
118 Sn	43.30	182864.70 ppb	0.64	45.00	90 - 110	
121 Sb	42.64	220290.00 ppb	1.29	45.00	90 - 110	
137 Ba	44.21	83771.84 ppb	1.38	45.00	90 - 110	
205 Tl	46.62	321947.41 ppb	0.75	45.00	90 - 110	
208 Pb	47.31	433132.69 ppb	0.51	45.00	90 - 110	
235 U	0.34	2628.18 ppb	3.79	0.32	90 - 110	
238 U	47.12	347821.19 ppb	0.47	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	457142.97	0.94	516131.41	88.6	60 - 125	
45 Sc	418057.44	0.26	751121.75	55.7	60 - 125	ISFail
45 Sc	71302.95	0.75	105116.80	67.8	60 - 125	
45 Sc	1975792.00	2.10	2578760.50	76.6	60 - 125	
72 Ge	98705.95	0.44	182569.23	54.1	60 - 125	ISFail
72 Ge	41446.01	0.48	62725.95	66.1	60 - 125	
72 Ge	395273.94	0.81	550487.25	71.8	60 - 125	
115 In	1931770.40	0.70	3088381.00	62.5	60 - 125	
159 Tb	1886119.40	1.10	2902786.50	65.0	60 - 125	
209 Bi	795800.38	0.31	1175901.50	67.7	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30137.D\98L30137.D#
Date Acquired:	Dec 28 2006 08:20 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB12
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.0776	32527.4 ppb	113.25	1.00	
9 Be	0.0150	48.9 ppb	39.16	1.00	
11 B	0.4299	3644.0 ppb	19.69	1.00	
23 Na	35.0400	178523.9 ppb	0.53	1.00	
24 Mg	3.5150	50194.4 ppb	2.24	1.00	
27 Al	2.9270	36633.1 ppb	2.07	1.00	
39 K	4.3960	13060.4 ppb	27.78	1.00	
40 Ca	5.8690	32916.0 ppb	0.77	1.00	
47 Ti	0.0514	168.9 ppb	4.47	1.00	
51 V	0.0463	860.9 ppb	24.37	1.00	
52 Cr	0.0100	270.9 ppb	68.37	1.00	
55 Mn	0.0229	1589.1 ppb	6.96	1.00	
56 Fe	2.5710	15347.0 ppb	1.23	1.00	
59 Co	0.0146	361.1 ppb	21.29	1.00	
60 Ni	0.0194	49.1 ppb	26.98	1.00	
63 Cu	-0.0011	289.1 ppb	780.64	1.00	
66 Zn	0.0265	1380.1 ppb	207.47	1.00	
75 As	0.0384	30.2 ppb	43.86	1.00	
78 Se	0.0088	4.4 ppb	118.88	1.00	
88 Sr	0.0397	2015.8 ppb	0.73	1.00	
89 Y	--------	2564240.0 ppb	--------	1.00	
95 Mo	0.0642	230.0 ppb	11.42	1.00	
107 Ag	0.0179	205.6 ppb	22.17	1.00	
111 Cd	-0.0770	1047.9 ppb	39.82	1.00	
118 Sn	0.0796	1455.7 ppb	20.39	1.00	
121 Sb	0.3095	1839.1 ppb	10.99	1.00	
137 Ba	0.0130	82.2 ppb	124.06	1.00	
205 Tl	0.0736	574.5 ppb	1.65	1.00	
208 Pb	-0.0513	1122.3 ppb	14.26	1.00	
235 U	-0.0003	4.4 ppb	166.43	1.00	
238 U	0.0266	225.6 ppb	13.25	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	459558.0	0.87	516131.41	89.0	60 - 125	
45 Sc	402100.0	0.34	751121.75	53.5	60 - 125	ISFail
45 Sc	70385.9	0.34	105116.80	67.0	60 - 125	
45 Sc	1926005.8	0.83	2578760.50	74.7	60 - 125	
72 Ge	92911.9	0.95	182569.23	50.9	60 - 125	ISFail
72 Ge	39773.9	0.58	62725.95	63.4	60 - 125	
72 Ge	368122.8	0.80	550487.25	66.9	60 - 125	
115 In	1897146.0	0.84	3088381.00	61.4	60 - 125	
159 Tb	1819512.6	0.31	2902786.50	62.7	60 - 125	
209 Bi	792245.2	0.37	1175901.50	67.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
2 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30138.D\98L30138.D#
Date Acquired: Dec 28 2006 08:28 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: IML034SB
Misc Info:
Vial Number: 4102
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	33511.0	0.0000	-0.0151	ppb	570.44	400.00	
9 Be	# 3	6	20.0	0.0000	-0.0022	ppb	220.55	400.00	
11 B	# 3	6	3369.4	0.0000	0.0372	ppb	156.78	400.00	
23 Na	# 1	45	175729.5	0.0000	23.4900	ppb	4.38	300000.00	
24 Mg	# 3	45	25285.1	0.0000	-0.6847	ppb	6.40	200000.00	
27 Al	# 3	45	20664.8	0.0000	0.9177	ppb	3.21	200000.00	
39 K	# 2	45	13440.7	0.0000	4.2730	ppb	11.99	100000.00	
40 Ca	# 1	45	39019.6	0.0000	7.7760	ppb	1.00	300000.00	
47 Ti	# 3	45	164.5	0.0000	0.0418	ppb	40.81	3000.00	
51 V	# 2	45	891.8	0.0000	0.0487	ppb	25.35	3000.00	
52 Cr	# 2	45	236.4	0.0000	-0.0098	ppb	55.91	3000.00	
55 Mn	# 3	45	1604.6	0.0000	0.0204	ppb	11.82	3000.00	
56 Fe	# 1	45	7283.5	0.0000	-0.0510	ppb	61.05	100000.00	
59 Co	# 3	45	121.1	0.0000	0.0006	ppb	411.31	3000.00	
60 Ni	# 2	45	56.4	0.0000	0.0255	ppb	25.57	3000.00	
63 Cu	# 2	45	510.7	0.0000	0.0809	ppb	11.21	3000.00	
66 Zn	# 3	45	2443.7	0.0000	0.4510	ppb	15.36	3000.00	
75 As	# 2	45	24.9	0.0000	0.0144	ppb	104.10	3000.00	
78 Se	# 1	72	1.6	0.0000	-0.0227	ppb	17.04	3000.00	
88 Sr	# 3	72	1321.2	0.0000	0.0012	ppb	334.14	3000.00	
89 Y	# 3	---	2689000.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	78.9	0.0000	0.0142	ppb	14.42	3000.00	
107 Ag	# 3	115	102.2	0.0000	0.0012	ppb	336.89	250.00	
111 Cd	# 3	115	1096.1	0.0000	-0.0769	ppb	35.37	3000.00	
118 Sn	# 3	115	3651.8	0.0000	0.5738	ppb	3.10	3000.00	
121 Sb	# 3	115	521.1	0.0000	0.0450	ppb	23.30	3000.00	
137 Ba	# 3	115	108.9	0.0000	0.0248	ppb	38.49	3000.00	
205 Tl	# 3	209	298.9	0.0000	0.0318	ppb	11.18	3000.00	
208 Pb	# 3	209	1011.2	0.0000	-0.0679	ppb	2.93	3000.00	
235 U	# 3	209	5.6	0.0000	-0.0002	ppb	132.36	3000.00	
238 U	# 3	209	58.9	0.0000	0.0036	ppb	47.52	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	480835.31	1.26	516131.41	93.2	60 - 125	
45 Sc # 1	420121.53	0.41	751121.75	55.9	60 - 125	ISFail
45 Sc # 2	72561.09	1.05	105116.80	69.0	60 - 125	
45 Sc # 3	2011403.90	0.75	2578760.50	78.0	60 - 125	
72 Ge # 1	97577.52	0.94	182569.23	53.4	60 - 125	ISFail
72 Ge # 2	41620.95	0.66	62725.95	66.4	60 - 125	
72 Ge # 3	388237.84	0.88	550487.25	70.5	60 - 125	
115 In # 3	1983735.80	0.37	3088381.00	64.2	60 - 125	
159 Tb # 3	1911453.30	0.47	2902786.50	65.8	60 - 125	
209 Bi # 3	824416.06	0.64	1175901.50	70.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

Sample QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30139.D\98L30139.D#
Date Acquired:	Dec 28 2006 08:37 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	IML034SL
Misc Info:	
Vial Number:	4103
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	278649.7	0.0000	44.8700	ppb	0.67	400.00	
9 Be	# 3	6	77089.4	0.0000	43.8200	ppb	0.88	400.00	
11 B	# 3	6	53104.2	0.0000	45.7800	ppb	0.94	400.00	
23 Na	# 1	45	5328917.0	0.0000	5735.0000	ppb	1.75	300000.00	
24 Mg	# 3	45	34795340.0	0.0000	5464.0000	ppb	1.11	200000.00	
27 Al	# 3	45	46002688.0	0.0000	5333.0000	ppb	0.71	200000.00	
39 K	# 2	45	871737.9	0.0000	4780.0000	ppb	0.66	100000.00	
40 Ca	# 1	45	11675050.0	0.0000	4970.0000	ppb	0.63	300000.00	
47 Ti	# 3	45	58796.2	0.0000	47.4700	ppb	1.80	3000.00	
51 V	# 2	45	86909.5	0.0000	48.5200	ppb	0.95	3000.00	
52 Cr	# 2	45	104168.4	0.0000	49.1000	ppb	1.14	3000.00	
55 Mn	# 3	45	961161.3	0.0000	45.2400	ppb	2.71	3000.00	
56 Fe	# 1	45	15271470.0	0.0000	4733.0000	ppb	1.02	100000.00	
59 Co	# 3	45	782903.2	0.0000	43.4200	ppb	0.58	3000.00	
60 Ni	# 2	45	45797.5	0.0000	48.5800	ppb	0.97	3000.00	
63 Cu	# 2	45	123448.3	0.0000	48.5900	ppb	0.71	3000.00	
66 Zn	# 3	45	103141.9	0.0000	43.7100	ppb	0.55	3000.00	
75 As	# 2	45	11312.2	0.0000	44.4100	ppb	1.46	3000.00	
78 Se	# 1	72	4684.8	0.0000	48.4900	ppb	3.61	3000.00	
88 Sr	# 3	72	914265.2	0.0000	43.1400	ppb	0.34	3000.00	
89 Y	# 3	---	2594286.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	151652.0	0.0000	49.7300	ppb	0.98	3000.00	
107 Ag	# 3	115	362304.2	0.0000	57.1500	ppb	1.40	250.00	
111 Cd	# 3	115	68205.7	0.0000	46.2400	ppb	0.82	3000.00	
118 Sn	# 3	115	204202.4	0.0000	50.0500	ppb	0.97	3000.00	
121 Sb	# 3	115	231695.9	0.0000	46.3900	ppb	0.89	3000.00	
137 Ba	# 3	115	85289.7	0.0000	46.5500	ppb	1.42	3000.00	
205 Tl	# 3	209	333211.3	0.0000	48.6900	ppb	0.34	3000.00	
208 Pb	# 3	209	453353.8	0.0000	49.9600	ppb	0.38	3000.00	
235 U	# 3	209	793.4	0.0000	0.1031	ppb	7.18	3000.00	
238 U	# 3	209	376428.0	0.0000	51.4500	ppb	0.61	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	465107.97	0.95	516131.41	90.1	60 - 125	
45 Sc # 1	405994.09	1.13	751121.75	54.1	60 - 125	ISFail
45 Sc # 2	70930.92	0.91	105116.80	67.5	60 - 125	
45 Sc # 3	1980830.40	0.29	2578760.50	76.8	60 - 125	
72 Ge # 1	95436.16	1.40	182569.23	52.3	60 - 125	ISFail
72 Ge # 2	40874.18	0.52	62725.95	65.2	60 - 125	
72 Ge # 3	392626.50	0.53	550487.25	71.3	60 - 125	
115 In # 3	1867923.30	0.60	3088381.00	60.5	60 - 125	
159 Tb # 3	1808801.90	1.75	2902786.50	62.3	60 - 125	
209 Bi # 3	788760.69	0.41	1175901.50	67.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

T119

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30140.D\98L30140.D#
Date Acquired: Dec 28 2006 08:46 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: IML034SC
Misc Info:
Vial Number: 4104
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	286748.8	0.0000	45.6300	ppb	0.45	400.00	
9 Be	# 3	6	79488.3	0.0000	44.5600	ppb	0.67	400.00	
11 B	# 3	6	54406.1	0.0000	46.2900	ppb	1.43	400.00	
23 Na	# 1	45	5478519.0	0.0000	5822.0000	ppb	0.27	300000.00	
24 Mg	# 3	45	35798220.0	0.0000	5582.0000	ppb	0.49	200000.00	
27 Al	# 3	45	47143200.0	0.0000	5428.0000	ppb	0.94	200000.00	
39 K	# 2	45	901427.7	0.0000	4907.0000	ppb	1.95	100000.00	
40 Ca	# 1	45	11983520.0	0.0000	5035.0000	ppb	0.47	300000.00	
47 Ti	# 3	45	60168.2	0.0000	48.2400	ppb	0.44	3000.00	
51 V	# 2	45	89065.0	0.0000	49.3500	ppb	0.18	3000.00	
52 Cr	# 2	45	106848.1	0.0000	49.9700	ppb	0.09	3000.00	
55 Mn	# 3	45	1012801.0	0.0000	47.3500	ppb	0.74	3000.00	
56 Fe	# 1	45	15767730.0	0.0000	4823.0000	ppb	0.49	100000.00	
59 Co	# 3	45	798952.8	0.0000	44.0000	ppb	0.76	3000.00	
60 Ni	# 2	45	46815.8	0.0000	49.2800	ppb	0.53	3000.00	
63 Cu	# 2	45	125993.2	0.0000	49.2100	ppb	0.48	3000.00	
66 Zn	# 3	45	105520.2	0.0000	44.4200	ppb	0.72	3000.00	
75 As	# 2	45	11640.0	0.0000	45.3500	ppb	0.87	3000.00	
78 Se	# 1	72	4735.7	0.0000	49.6000	ppb	0.92	3000.00	
88 Sr	# 3	72	938738.4	0.0000	44.1900	ppb	0.82	3000.00	
89 Y	# 3	---	2616921.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	155301.7	0.0000	51.0400	ppb	0.75	3000.00	
107 Ag	# 3	115	368900.7	0.0000	58.3200	ppb	0.65	250.00	
111 Cd	# 3	115	69250.8	0.0000	47.0700	ppb	0.37	3000.00	
118 Sn	# 3	115	211598.2	0.0000	51.9900	ppb	1.21	3000.00	
121 Sb	# 3	115	238199.5	0.0000	47.8000	ppb	0.79	3000.00	
137 Ba	# 3	115	87363.4	0.0000	47.7900	ppb	0.41	3000.00	
205 Tl	# 3	209	342384.4	0.0000	49.7000	ppb	1.00	3000.00	
208 Pb	# 3	209	464827.9	0.0000	50.8900	ppb	0.29	3000.00	
235 U	# 3	209	836.7	0.0000	0.1080	ppb	9.03	3000.00	
238 U	# 3	209	386734.1	0.0000	52.5100	ppb	0.60	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	471589.78	0.79	516131.41	91.4	60 - 125	
45 Sc # 1	411334.38	0.28	751121.75	54.8	60 - 125	ISFail
45 Sc # 2	71477.19	0.08	105116.80	68.0	60 - 125	
45 Sc # 3	1994824.40	1.57	2578760.50	77.4	60 - 125	
72 Ge # 1	94281.46	0.54	182569.23	51.6	60 - 125	ISFail
72 Ge # 2	41539.59	0.48	62725.95	66.2	60 - 125	
72 Ge # 3	393597.63	1.18	550487.25	71.5	60 - 125	
115 In # 3	1863671.60	0.43	3088381.00	60.3	60 - 125	
159 Tb # 3	1841641.40	0.20	2902786.50	63.4	60 - 125	
209 Bi # 3	794007.44	0.33	1175901.50	67.5	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

7128

Sample QC Report

Data File: D:\DATA\I982006\L\I98L30.B\98L30141.D\98L30141.D#
Date Acquired: Dec 28 2006 08:55 am
Acq. Method: EMAX6020.M
Operator: JEE
Sample Name: L280-22
Misc Info:
Vial Number: 4105
Current Method: C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File: C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update: Dec 27 2006 12:42 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

Tune #	Name
#1	h2.u
#2	he.u
#3	norm.u

QC Elements

Element	Tune	ISTD	CPS	Corr Conc	Raw Conc	Units	Conc RSD(%)	High Limit	Flag
7 Li	# 3	6	76265.8	0.0000	8.1050	ppb	0.24	400.00	
9 Be	# 3	6	348.9	0.0000	0.1871	ppb	14.76	400.00	
11 B	# 3	6	6057.2	0.0000	2.6550	ppb	4.64	400.00	
23 Na	# 1	45	615182.8	0.0000	502.9000	ppb	0.93	300000.00	
24 Mg	# 3	45	31616970.0	0.0000	4836.0000	ppb	0.86	200000.00	
27 Al	# 3	45	83173080.0	0.0000	9395.0000	ppb	0.47	200000.00	
39 K	# 2	45	739255.0	0.0000	3943.0000	ppb	0.21	100000.00	
40 Ca	# 1	45	10203210.0	0.0000	4256.0000	ppb	0.41	300000.00	
47 Ti	# 3	45	1441169.0	0.0000	1136.0000	ppb	0.74	3000.00	
51 V	# 2	45	62621.2	0.0000	33.9800	ppb	0.80	3000.00	
52 Cr	# 2	45	27733.6	0.0000	12.6700	ppb	0.84	3000.00	
55 Mn	# 3	45	4469647.0	0.0000	205.2000	ppb	1.00	3000.00	
56 Fe	# 1	45	41050408.0	0.0000	12470.0000	ppb	0.49	100000.00	
59 Co	# 3	45	87404.8	0.0000	4.7170	ppb	0.92	3000.00	
60 Ni	# 2	45	5325.4	0.0000	5.4830	ppb	0.96	3000.00	
63 Cu	# 2	45	29277.9	0.0000	11.1500	ppb	0.80	3000.00	
66 Zn	# 3	45	90644.3	0.0000	37.3400	ppb	0.63	3000.00	
75 As	# 2	45	414.5	0.0000	1.5090	ppb	3.46	3000.00	
78 Se	# 1	72	20.7	0.0000	0.1666	ppb	19.16	3000.00	
88 Sr	# 3	72	502358.8	0.0000	21.8200	ppb	0.55	3000.00	
89 Y	# 3	---	2749126.0	----	--------	ppb	--------	#VALUE!	
95 Mo	# 3	115	1622.4	0.0000	0.5243	ppb	5.55	3000.00	
107 Ag	# 3	115	395.6	0.0000	0.0487	ppb	27.21	250.00	
111 Cd	# 3	115	1376.5	0.0000	0.1647	ppb	27.45	3000.00	
118 Sn	# 3	115	16170.6	0.0000	3.7280	ppb	0.85	3000.00	
121 Sb	# 3	115	933.4	0.0000	0.1345	ppb	10.40	3000.00	
137 Ba	# 3	115	195201.6	0.0000	107.0000	ppb	0.84	3000.00	
205 Tl	# 3	209	3242.8	0.0000	0.4623	ppb	4.48	3000.00	
208 Pb	# 3	209	43194.2	0.0000	4.5870	ppb	0.96	3000.00	
235 U	# 3	209	30.0	0.0000	0.0030	ppb	43.02	3000.00	
238 U	# 3	209	4651.1	0.0000	0.6296	ppb	2.81	3000.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li # 3	460919.69	1.23	516131.41	89.3	60 - 125	
45 Sc # 1	414258.94	0.26	751121.75	55.2	60 - 125	ISFail
45 Sc # 2	72691.77	0.57	105116.80	69.2	60 - 125	
45 Sc # 3	2033389.50	1.46	2578760.50	78.9	60 - 125	
72 Ge # 1	99683.99	0.87	182569.23	54.6	60 - 125	ISFail
72 Ge # 2	43482.72	0.25	62725.95	69.3	60 - 125	
72 Ge # 3	425916.59	1.09	550487.25	77.4	60 - 125	
115 In # 3	1859961.00	0.26	3088381.00	60.2	60 - 125	
159 Tb # 3	1850480.00	0.78	2902786.50	63.7	60 - 125	
209 Bi # 3	791321.63	0.37	1175901.50	67.3	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ICS-A QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30142.D\98L30142.D#
Date Acquired:	Dec 28 2006 09:03 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSA3
Misc Info:	
Vial Number:	1201
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-A
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.29	31173.1 ppb	11.27	---	
9 Be	0.01	38.9 ppb	94.08	---	
11 B	1.53	4475.4 ppb	4.65	---	
23 Na	107000.00	103672600.0 ppb	0.80	---	
24 Mg	105300.00	674141890.0 ppb	0.45	---	
27 Al	104800.00	908625920.0 ppb	0.12	---	
39 K	94830.00	16620730.0 ppb	0.77	---	
40 Ca	98820.00	248086590.0 ppb	0.27	---	
47 Ti	2207.00	2744426.0 ppb	0.42	---	
51 V	0.41	1469.4 ppb	3.43	---	
52 Cr	0.70	1694.8 ppb	1.68	---	
55 Mn	2.97	64561.1 ppb	0.65	---	
56 Fe	94370.00	325872900.0 ppb	0.51	---	
59 Co	0.64	11721.4 ppb	2.07	---	
60 Ni	0.93	880.3 ppb	7.56	---	
63 Cu	2.02	5283.3 ppb	2.10	---	
66 Zn	5.79	14932.6 ppb	2.19	---	
75 As	0.24	79.8 ppb	18.90	---	
78 Se	0.05	13.6 ppb	57.79	---	
88 Sr	1.77	71750.5 ppb	1.54	---	
89 Y	--------	2732081.0 ppb	--------	---	
95 Mo	2355.00	7258992.0 ppb	0.48	---	
107 Ag	0.06	493.4 ppb	12.84	---	
111 Cd	1.12	2799.6 ppb	9.61	---	
118 Sn	0.15	1732.4 ppb	10.18	---	
121 Sb	0.10	784.5 ppb	2.98	---	
137 Ba	0.81	1555.7 ppb	5.25	---	
205 Tl	0.13	912.3 ppb	8.67	---	
208 Pb	0.43	5315.2 ppb	2.95	---	
235 U	0.00	6.7 ppb	3950.10	---	
238 U	0.01	112.2 ppb	33.91	---	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	425704.1	1.32	516131.41	82.5	60 - 125	
45 Sc	434619.6	0.67	751121.75	57.9	60 - 125	ISFail
45 Sc	69101.9	0.88	105116.80	65.7	60 - 125	
45 Sc	1992192.5	0.89	2578760.50	77.3	60 - 125	
72 Ge	151622.5	0.34	182569.23	83.0	60 - 125	
72 Ge	61083.5	1.17	62725.95	97.4	60 - 125	
72 Ge	727264.9	2.19	550487.25	132.1	60 - 125	ISFail
115 In	1888286.0	0.48	3088381.00	61.1	60 - 125	
159 Tb	1977947.3	0.98	2902786.50	68.1	60 - 125	
209 Bi	765531.1	0.62	1175901.50	65.1	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures
2 :ISTD Failures

0 :Max. Number of Failures Allowed
0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

T122

ICS-AB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30143.D\98L30143.D#
Date Acquired:	Dec 28 2006 09:12 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	ICSAB3
Misc Info:	
Vial Number:	1202
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	ICS-AB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	18.59	107994.4 ppb	0.53	20.00	80 - 120	
9 Be	17.13	24213.9 ppb	1.74	20.00	80 - 120	
11 B	20.54	20556.7 ppb	1.48	20.00	80 - 120	
23 Na	104300.00	92426600.0 ppb	0.44	100000.00	80 - 120	
24 Mg	102900.00	609679620.0 ppb	1.32	100000.00	80 - 120	
27 Al	103700.00	832441410.0 ppb	0.63	100000.00	80 - 120	
39 K	94410.00	15517640.0 ppb	0.80	100000.00	80 - 120	
40 Ca	97420.00	223672610.0 ppb	0.29	100000.00	80 - 120	
47 Ti	2197.00	2529943.0 ppb	0.92	2000.00	80 - 120	
51 V	20.01	33160.7 ppb	1.30	20.00	80 - 120	
52 Cr	20.34	39551.6 ppb	1.69	20.00	80 - 120	
55 Mn	20.53	406735.7 ppb	1.44	20.00	80 - 120	
56 Fe	94260.00	297672380.0 ppb	0.43	100000.00	80 - 120	
59 Co	17.29	290469.8 ppb	1.12	20.00	80 - 120	
60 Ni	19.45	16769.6 ppb	1.18	20.00	80 - 120	
63 Cu	20.27	47202.7 ppb	0.98	20.00	80 - 120	
66 Zn	21.47	47822.3 ppb	1.04	20.00	80 - 120	
75 As	19.14	4464.1 ppb	1.47	20.00	80 - 120	
78 Se	14.19	2030.4 ppb	3.64	20.00	80 - 120	Fail
88 Sr	10.96	409529.1 ppb	2.45	20.00	80 - 120	Fail
89 Y	--------	2506832.0 ppb	--------	20.00	80 - 120	
95 Mo	2321.00	6635288.0 ppb	1.32	2000.00	80 - 120	
107 Ag	21.23	126228.6 ppb	0.45	20.00	80 - 120	
111 Cd	19.76	27936.9 ppb	0.26	20.00	80 - 120	
118 Sn	19.35	74652.2 ppb	0.79	20.00	80 - 120	
121 Sb	19.53	91619.3 ppb	0.81	20.00	80 - 120	
137 Ba	21.48	36928.3 ppb	0.50	20.00	80 - 120	
205 Tl	20.59	130057.3 ppb	0.53	20.00	80 - 120	
208 Pb	21.11	177478.7 ppb	0.78	20.00	80 - 120	
235 U	0.04	291.1 ppb	11.72	0.14	80 - 120	Fail
238 U	21.89	147749.9 ppb	0.27	19.86	80 - 120	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	373585.3	1.57	516131.41	72.4	60 - 125	
45 Sc	397479.8	0.47	751121.75	52.9	60 - 125	ISFail
45 Sc	64801.3	1.25	105116.80	61.6	60 - 125	
45 Sc	1844837.3	0.03	2578760.50	71.5	60 - 125	
72 Ge	141045.3	0.50	182569.23	77.3	60 - 125	
72 Ge	57166.5	1.01	62725.95	91.1	60 - 125	
72 Ge	689734.6	2.60	550487.25	125.3	60 - 125	ISFail
115 In	1751450.6	0.82	3088381.00	56.7	60 - 125	ISFail
159 Tb	1873190.6	0.77	2902786.50	64.5	60 - 125	
209 Bi	727545.3	0.06	1175901.50	61.9	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
3 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: Fail
ISTD: Fail

CCV QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30146.D\98L30146.D#
Date Acquired:	Dec 28 2006 09:38 am
Operator:	JEE
Sample Name:	CCV13
Misc Info:	
Vial Number:	1307
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal Update:	Dec 27 2006 12:42 pm
Sample Type:	CCV
Total Dil Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	Expected	QC Range(%)	Flag
7 Li	44.77	221227.09 ppb	0.69	45.00	90 - 110	
9 Be	43.79	61284.31 ppb	0.74	45.00	90 - 110	
11 B	44.71	41308.60 ppb	1.73	45.00	90 - 110	
23 Na	5163.00	4001397.00 ppb	0.99	4500.00	90 - 110	Fail
24 Mg	5009.00	28555630.00 ppb	0.78	4500.00	90 - 110	Fail
27 Al	4975.00	38416360.00 ppb	0.87	4500.00	90 - 110	Fail
39 K	4494.00	759064.50 ppb	0.52	4500.00	90 - 110	
40 Ca	4639.00	9061411.00 ppb	0.91	4500.00	90 - 110	
47 Ti	44.09	48889.57 ppb	0.80	45.00	90 - 110	
51 V	44.80	74304.29 ppb	0.82	45.00	90 - 110	
52 Cr	45.10	88554.68 ppb	0.44	45.00	90 - 110	
55 Mn	41.40	787383.31 ppb	0.53	45.00	90 - 110	
56 Fe	4646.00	12464750.00 ppb	0.15	4500.00	90 - 110	
59 Co	40.70	656928.50 ppb	0.34	45.00	90 - 110	
60 Ni	45.54	39721.54 ppb	0.98	45.00	90 - 110	
63 Cu	45.65	107324.00 ppb	0.40	45.00	90 - 110	
66 Zn	41.40	87501.82 ppb	0.12	45.00	90 - 110	
75 As	44.35	10453.66 ppb	0.59	45.00	90 - 110	
78 Se	46.82	4081.42 ppb	0.85	45.00	90 - 110	
88 Sr	40.71	771327.13 ppb	0.81	45.00	90 - 110	
89 Y	--------	2336908.00 ppb	--------	---	90 - 110	
95 Mo	44.80	126949.30 ppb	1.96	45.00	90 - 110	
107 Ag	44.95	264814.19 ppb	1.43	45.00	90 - 110	
111 Cd	43.57	59788.33 ppb	0.86	45.00	90 - 110	
118 Sn	43.43	164820.59 ppb	1.82	45.00	90 - 110	
121 Sb	43.15	200292.91 ppb	1.96	45.00	90 - 110	
137 Ba	45.19	76952.90 ppb	1.20	45.00	90 - 110	
205 Tl	46.39	300878.31 ppb	0.06	45.00	90 - 110	
208 Pb	47.12	405239.69 ppb	0.44	45.00	90 - 110	
235 U	0.33	2420.34 ppb	0.61	0.32	90 - 110	
238 U	46.89	325148.81 ppb	0.74	44.69	90 - 110	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	370014.09	1.41	516131.41	71.7	60 - 125	
45 Sc	337555.69	0.42	751121.75	44.9	60 - 125	ISFail
45 Sc	65628.65	0.57	105116.80	62.4	60 - 125	
45 Sc	1773162.50	1.19	2578760.50	68.8	60 - 125	
72 Ge	86066.89	1.20	182569.23	47.1	60 - 125	ISFail
72 Ge	39183.36	1.07	62725.95	62.5	60 - 125	
72 Ge	350994.78	1.38	550487.25	63.8	60 - 125	
115 In	1735935.30	1.19	3088381.00	56.2	60 - 125	ISFail
159 Tb	1736581.00	1.71	2902786.50	59.8	60 - 125	ISFail
209 Bi	747479.25	0.79	1175901.50	63.6	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

3 :Element Failures — 0 :Max. Number of Failures Allowed
4 :ISTD Failures — 0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes: **Fail**
ISTD: **Fail**

ICB QC Report

Data File:	D:\DATA\I982006\L\I98L30.B\98L30147.D\98L30147.D#
Date Acquired:	Dec 28 2006 09:46 am
Acq. Method:	EMAX6020.M
Operator:	JEE
Sample Name:	CCB13
Misc Info:	
Vial Number:	1102
Current Method:	C:\ICPCHEM\1\METHODS\EMAX6020.M
Calibration File:	C:\ICPCHEM\1\CALIB\EMAX6020.C
Last Cal. Update:	Dec 27 2006 12:42 pm
Sample Type:	CCB
Dilution Factor:	1.00

QC Elements

Element	Conc.	CPS	Conc RSD(%)	High Limit	Flag
7 Li	0.1760	26382.6 ppb	49.21	1.00	
9 Be	0.0124	35.6 ppb	76.55	1.00	
11 B	0.2929	2789.3 ppb	10.78	1.00	
23 Na	56.3900	153831.7 ppb	2.19	1.00	
24 Mg	5.9560	57194.1 ppb	1.61	1.00	
27 Al	3.9200	39385.7 ppb	4.15	1.00	
39 K	11.7200	12745.6 ppb	16.43	1.00	
40 Ca	6.5370	26827.4 ppb	5.12	1.00	
47 Ti	0.1148	214.5 ppb	28.09	1.00	
51 V	0.0770	811.6 ppb	32.02	1.00	
52 Cr	0.0099	240.2 ppb	84.86	1.00	
55 Mn	0.0329	1572.4 ppb	8.89	1.00	
56 Fe	3.5840	14465.3 ppb	0.68	1.00	
59 Co	0.0161	340.0 ppb	11.34	1.00	
60 Ni	0.0205	44.4 ppb	30.74	1.00	
63 Cu	0.0354	337.8 ppb	15.97	1.00	
66 Zn	-0.0188	1119.0 ppb	286.47	1.00	
75 As	0.0307	25.1 ppb	64.05	1.00	
78 Se	0.0349	5.8 ppb	25.02	1.00	
88 Sr	0.0404	1766.9 ppb	14.73	1.00	
89 Y	--------	2223944.0 ppb	--------	1.00	
95 Mo	0.1133	333.4 ppb	1.72	1.00	
107 Ag	0.0193	186.7 ppb	32.29	1.00	
111 Cd	-0.0513	947.3 ppb	74.34	1.00	
118 Sn	0.0898	1306.8 ppb	16.98	1.00	
121 Sb	0.2982	1553.5 ppb	9.55	1.00	
137 Ba	0.0319	102.2 ppb	41.79	1.00	
205 Tl	0.0803	574.5 ppb	12.15	1.00	
208 Pb	-0.0571	990.1 ppb	3.87	1.00	
235 U	0.0015	16.7 ppb	55.07	1.00	
238 U	0.0323	247.8 ppb	20.38	1.00	

ISTD Elements

Element	CPS Mean	CPS RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
6 Li	366689.6	1.37	516131.41	71.0	60 - 125	
45 Sc	312995.2	0.55	751121.75	41.7	60 - 125	ISFail
45 Sc	62445.2	0.73	105116.80	59.4	60 - 125	ISFail
45 Sc	1686990.1	1.08	2578760.50	65.4	60 - 125	
72 Ge	77816.1	1.35	182569.23	42.6	60 - 125	ISFail
72 Ge	36449.6	0.92	62725.95	58.1	60 - 125	ISFail
72 Ge	320395.8	0.39	550487.25	58.2	60 - 125	ISFail
115 In	1654803.9	0.42	3088381.00	53.6	60 - 125	ISFail
159 Tb	1677802.4	0.99	2902786.50	57.8	60 - 125	ISFail
209 Bi	733325.4	0.37	1175901.50	62.4	60 - 125	

ISTD Ref File : D:\DATA\I982006\L\I98L30.B\98L30004.D\98L30004.D#

0 :Element Failures — 0 :Max. Number of Failures Allowed
7 :ISTD Failures — 0 :Max. Nnumber of ISTD Failures Allowed

Data Results:

Analytes: Pass
ISTD: Fail

T125

SEQUENCE FILE : I98L30

4-18	19-33	34-43	44-53	54-63
LFID	LSID	TIME	DATE	DF
98L30003	BLNK	12:03	12/27/06	1.00
98L30004	S0	12:12	12/27/06	1.00
98L30005	S3 10	12:21	12/27/06	1.00
98L30006	S4 50	12:29	12/27/06	1.00
98L30007	S5 100	12:38	12/27/06	1.00
98L30008	ICV	12:46	12/27/06	1.00
98L30009	ICB	12:55	12/27/06	1.00
98L30010	MRL1	13:03	12/27/06	1.00
98L30011	ICSA	13:12	12/27/06	1.00
98L30012	ICSAB	13:21	12/27/06	1.00
98L30013	BLANK	13:29	12/27/06	1.00
98L30014	BLANK	13:38	12/27/06	1.00
98L30015	CCV1	13:47	12/27/06	1.00
98L30016	CCB1	13:55	12/27/06	1.00
98L30017	IML027WB	14:04	12/27/06	1.00
98L30018	IML027WL	14:13	12/27/06	1.00
98L30019	IML027WC	14:21	12/27/06	1.00
98L30020	L053-01A	14:30	12/27/06	1.00
98L30021	L053-01	14:38	12/27/06	1.00
98L30022	L053-01J	14:47	12/27/06	5.00
98L30023	L077-07	14:56	12/27/06	1.00
98L30024	L812-01	15:04	12/27/06	1.00
98L30025	L811-01	15:13	12/27/06	1.00
98L30026	L811-02	15:22	12/27/06	1.00
98L30027	CCV2	15:30	12/27/06	1.00
98L30028	CCB2	15:39	12/27/06	1.00
98L30029	IML025WB	15:47	12/27/06	1.00
98L30030	IML025WL	15:56	12/27/06	1.00
98L30031	IML025WC	16:38	12/27/06	1.00
98L30032	L810-01A	16:47	12/27/06	1.00
98L30033	L810-01	16:56	12/27/06	1.00
98L30034	L810-01J	17:04	12/27/06	5.00
98L30035	L810-02	17:13	12/27/06	1.00
98L30036	L810-03	17:22	12/27/06	1.00
98L30037	L810-04	17:30	12/27/06	1.00
98L30038	L810-05	17:39	12/27/06	1.00
98L30039	CCV3	17:48	12/27/06	1.00
98L30040	CCB3	17:56	12/27/06	1.00
98L30041	L810-06	18:05	12/27/06	1.00
98L30042	L810-07	18:14	12/27/06	1.00
98L30043	L810-08	18:22	12/27/06	1.00
98L30044	L810-09	18:32	12/27/06	1.00
98L30045	L810-10	18:41	12/27/06	1.00
98L30046	L810-11	18:49	12/27/06	1.00
98L30047	L810-12	18:58	12/27/06	1.00
98L30048	BLANK	19:07	12/27/06	1.00
98L30049	IML026SB	19:39	12/27/06	1.00
98L30050	IML026SL	19:48	12/27/06	1.00
98L30051	CCV4	19:56	12/27/06	1.00
98L30052	CCB4	20:05	12/27/06	1.00
98L30053	IML026SC	20:14	12/27/06	1.00
98L30054	L077-01A	20:22	12/27/06	1.00
98L30055	L077-01	20:31	12/27/06	1.00
98L30056	L077-01J	20:39	12/27/06	5.00
98L30057	L077-02	20:48	12/27/06	1.00

98L30058	L077-03	20:57	12/27/06	1.00
98L30059	L077-04	21:05	12/27/06	1.00
98L30060	L077-05	21:14	12/27/06	1.00
98L30061	L077-06	21:23	12/27/06	1.00
98L30062	L039-03	21:31	12/27/06	5.00
98L30063	CCV5	21:40	12/27/06	1.00
98L30064	CCB5	21:49	12/27/06	1.00
98L30065	ICSA2	21:57	12/27/06	1.00
98L30066	ICSAB2	22:06	12/27/06	1.00
98L30067	BLANK	22:14	12/27/06	1.00
98L30068	BLANK	22:23	12/27/06	1.00
98L30069	CCV6	22:32	12/27/06	1.00
98L30070	CCB6	22:40	12/27/06	1.00
98L30071	IML030WB	22:49	12/27/06	1.00
98L30072	IML030WL	22:58	12/27/06	1.00
98L30073	IML030WC	23:06	12/27/06	1.00
98L30074	L162-01A	23:15	12/27/06	1.00
98L30075	L162-01	23:24	12/27/06	1.00
98L30076	L162-01J	23:32	12/27/06	5.00
98L30077	L819-01	23:41	12/27/06	1.00
98L30078	L819-02	23:50	12/27/06	1.00
98L30079	L819-03	23:58	12/27/06	1.00
98L30080	CCV7	00:07	12/28/06	1.00
98L30081	CCB7	00:15	12/28/06	1.00
98L30082	L819-04	00:24	12/28/06	1.00
98L30083	L819-05	00:33	12/28/06	1.00
98L30084	L819-06	00:41	12/28/06	1.00
98L30085	L819-07	00:50	12/28/06	1.00
98L30086	L819-08	00:59	12/28/06	1.00
98L30087	L819-09	01:07	12/28/06	1.00
98L30088	L819-10	01:16	12/28/06	1.00
98L30089	L819-11	01:25	12/28/06	1.00
98L30090	L819-12	01:33	12/28/06	1.00
98L30091	CCV8	01:42	12/28/06	1.00
98L30092	CCB8	01:51	12/28/06	1.00
98L30093	L821-01	01:59	12/28/06	1.00
98L30094	L821-02	02:08	12/28/06	1.00
98L30095	L821-03	02:17	12/28/06	1.00
98L30096	L821-04	02:25	12/28/06	1.00
98L30097	L823-01	02:34	12/28/06	1.00
98L30098	L823-02	02:43	12/28/06	1.00
98L30099	L823-03	02:51	12/28/06	1.00
98L30100	CCV9	03:00	12/28/06	1.00
98L30101	CCB9	03:08	12/28/06	1.00
98L30102	IML033SB	03:17	12/28/06	1.00
98L30103	IML033SL	03:26	12/28/06	1.00
98L30104	IML033SC	03:35	12/28/06	1.00
98L30105	L280-01A	03:43	12/28/06	1.00
98L30106	L280-01M	03:52	12/28/06	1.00
98L30107	L280-01S	04:01	12/28/06	1.00
98L30108	L280-01	04:09	12/28/06	1.00
98L30109	L280-01J	04:18	12/28/06	5.00
98L30110	L280-02	04:26	12/28/06	1.00
98L30111	L280-03	04:35	12/28/06	1.00
98L30112	CCV10	04:44	12/28/06	1.00
98L30113	CCB10	04:52	12/28/06	1.00
98L30114	L280-04	05:01	12/28/06	1.00
98L30115	L280-05	05:10	12/28/06	1.00

98L30116	L280-06	05:18	12/28/06	1.00
98L30117	L280-07	05:27	12/28/06	1.00
98L30118	L280-08	05:36	12/28/06	1.00
98L30119	L280-09	05:44	12/28/06	1.00
98L30120	L280-10	05:53	12/28/06	1.00
98L30121	L280-11	06:01	12/28/06	1.00
98L30122	L280-12	06:10	12/28/06	1.00
98L30123	L280-13	06:19	12/28/06	1.00
98L30124	CCV11	06:27	12/28/06	1.00
98L30125	CCB11	06:36	12/28/06	1.00
98L30126	L280-14	06:45	12/28/06	1.00
98L30127	L280-15	06:53	12/28/06	1.00
98L30128	L280-16	07:02	12/28/06	1.00
98L30129	L280-17	07:10	12/28/06	1.00
98L30130	L280-18	07:19	12/28/06	1.00
98L30131	L280-19	07:28	12/28/06	1.00
98L30132	L280-20	07:37	12/28/06	1.00
98L30133	L280-21A	07:45	12/28/06	1.00
98L30134	L280-21	07:54	12/28/06	1.00
98L30135	L280-21J	08:02	12/28/06	5.00
98L30136	CCV12	08:11	12/28/06	1.00
98L30137	CCB12	08:20	12/28/06	1.00
98L30138	IML034SB	08:28	12/28/06	1.00
98L30139	IML034SL	08:37	12/28/06	1.00
98L30140	IML034SC	08:46	12/28/06	1.00
98L30141	L280-22	08:55	12/28/06	1.00
98L30142	ICSA3	09:03	12/28/06	1.00
98L30143	ICSAB3	09:12	12/28/06	1.00
98L30144	BLANK	09:20	12/28/06	1.00
98L30145	BLANK	09:29	12/28/06	1.00
98L30146	CCV13	09:38	12/28/06	1.00
98L30147	CCB13	09:46	12/28/06	1.00

SDG : 06L280 UNIT : % ICPMS CHECK : I98L30 DATE : 12/27/06 INST : EMAXTI98

ANALYTE	Li	Be	B	Na	Mg	Al	K	Ca	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As	Se	Sr	Mo	Ag	Cd	Sn	Sb	Ba	Tl	Pb	U
BLNK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S3 10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S4 50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S5 100	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICV	94	95	99	106	107	106	104	104	101	100	101	101	102	101	101	101	97	98	98	104	101	102	99	100	102	100	96	97	96
ICB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
MRL1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICSA	----	----	----	96	98	98	94	98	112	----	----	----	98	----	----	----	----	----	----	----	113	----	----	----	----	----	----	----	----
ICSAB	93	87	100	96	96	98	94	97	110	100	102	108	97	92	97	102	116	99	75*	63*	112	105	101	98	100	107	104	105	108
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV1	98	100	99	105	106	105	103	104	100	99	100	101	104	97	101	102	104	102	103	104	98	100	100	99	98	100	103	104	102
CCB1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML027WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML027WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML027WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L812-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L811-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L811-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV2	98	101	105	107	108	107	103	104	98	100	100	100	105	96	102	103	104	103	106	103	99	102	102	100	100	103	104	105	104
CCB2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML025WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML025WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML025WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV3	97	95	101	108	108	106	102	103	99	99	101	101	103	96	102	103	103	100	103	104	98	101	100	99	99	102	102	103	99
CCB3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML026SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML026SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV4	97	96	98	110	110	108	102	103	99	100	101	100	103	95	103	103	101	101	103	102	99	101	100	99	99	102	104	105	103
CCB4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML026SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

L077-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L039-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV5	94	92	91	112*	112*	109	102	104	99	100	102	100	101	95	104	104	102	98	104	101	100	101	100	98	98	99	103	105	103
CCB5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICSA2	----	----	----	104	104	103	93	98	111	----	----	----	96	----	----	----	----	----	----	----	116	----	----	----	----	----	----	----	----
ICSAB2	92	84	101	101	103	103	93	97	109	102	103	106	95	90	98	103	112	97	73*	61*	113	106	101	97	99	106	104	106	108
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV6	97	96	97	111*	110	109	103	104	98	100	101	99	103	93	103	103	100	100	103	101	99	100	99	98	98	101	102	104	103
CCB6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML030WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML030WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML030WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV7	98	96	104	114*	112*	110	102	104	98	99	100	97	102	92	101	101	99	98	104	97	99	101	100	99	98	102	102	104	104
CCB7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV8	98	96	105	114*	109	108	101	105	97	98	99	93	102	91	100	100	96	99	103	93	98	99	97	97	97	101	102	104	104
CCB8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV9	99	98	109	115*	112*	111*	100	103	98	97	98	93	103	90	99	99	95	97	104	91	98	99	97	97	96	101	102	104	105
CCB9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML033SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML033SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML033SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01M	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01S	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV10	98	96	99	117*	114*	112*	101	104	98	99	99	93	103	92	100	100	94	96	103	91	99	100	98	97	96	99	103	105	104
CCB10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

L280-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-13	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV11	97	94	94	117*	113*	112*	100	104	98	99	101	93	101	91	101	102	94	97	102	91	102	101	98	97	96	100	103	105	104
CCB11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-14	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-15	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-16	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV12	97	93	92	117*	114*	112*	100	103	98	100	101	94	100	92	102	103	95	97	103	91	101	100	97	96	95	98	104	105	105
CCB12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML034SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML034SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML034SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICSA3	----	----	----	107	105	105	95	99	110	----	----	----	94	----	----	----	----	----	----	----	118	----	----	----	----	----	----	----	----
ICSAB3	93	86	103	104	103	104	94	97	110	100	102	103	94	86	97	101	107	96	71*	55*	116	106	99	97	98	107	103	106	109
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV13	99	97	99	115*	111*	111*	100	103	98	100	100	92	103	90	101	101	92	99	104	90	100	100	97	97	96	100	103	105	104
CCB13	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

SDG : 06L280 UNIT : UG/L SUMMARY of CALIBRATION BLANKS : I98L30 (SOIL) DATE : 12/27/06 INST : EMAXTI98

ANALYTE	Li	Be	B	Na	Mg	Al	K	Ca	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As	Se	Sr	Mo	Ag	Cd	Sn	Sb	Ba	Tl	Pb	U
BLNK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S3 10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S4 50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
S5 100	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICV	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICB	.089	.006	.179	5.31	.701	1.22	1.54	4.20	.010	-.042	-.005	.025	.135	.005	.029	.044	.591	.014	.013	.019	.025	.000	-.004	.040	.113	.003	.077	-.054	.007
MRL1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICSA	.232	.010	1.73	----	----	----	----	----	----	.385	.694	3.20	----	.689	.926	1.92	5.91	.241	.105	2.00	----	.060	1.12	.119	.158	.897	.063	.452	.011
ICSAB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB1	.090	-.000	.118	12.9	.597	.090	4.43	-.371	.032	.050	-.006	-.001	-.261	.001	.000	-.030	-.076	.006	.032	-.003	.047	.003	.093	.043	.159	.000	.057	-.090	.007
IML027WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML027WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML027WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L053-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L812-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L811-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L811-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB2	.110	-.002	1.76	25.1	.040	.285	6.09	-.097	.018	.076	-.021	.013	-.140	.001	-.003	-.010	-.048	.038	.000	.002	.027	.000	.143	.032	.147	.003	.051	-.108	.009
IML025WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML025WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML025WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB3	.083	.004	1.67	40.4	1.18	.375	5.07	.273	-.003	.016	-.021	.000	-.044	.003	.005	-.038	-.063	.009	.002	.002	.026	.004	-.009	.083	.186	-.000	.069	-.098	.010
L810-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L810-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML026SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML026SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB4	.069	.007	1.29	28.6	1.08	.681	1.40	1.39	.009	.030	-.017	.001	.142	.004	.002	-.036	-.058	.014	.011	.012	.024	.002	-.022	.047	.175	.005	.100	-.108	.013
IML026SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

L077-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L077-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L039-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB5	-.044	-.001	.627	22.2	1.09	.901	.308	1.67	-.000	.025	-.019	.002	.240	.003	.002	-.026	-.067	.002	.002	.008	.029	.005	-.060	.039	.162	-.000	.079	-.106	.014
ICSA2	.091	.011	1.88	----	----	----	----	----	----	.400	.665	3.08	----	.650	.936	1.99	5.64	.235	.040	1.95	----	.061	1.02	.130	.139	.806	.066	.384	.009
ICSAB2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB6	.027	.008	.292	33.1	2.17	1.29	3.89	1.99	.008	.048	-.017	.007	.728	.006	.002	-.001	-.077	.033	.000	.013	.048	.008	-.085	.043	.144	.002	.076	-.109	.014
IML030WB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML030WL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML030WC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L162-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB7	.158	.012	3.26	48.6	1.64	1.44	7.93	2.18	.013	.074	-.012	.006	.859	.007	.007	-.016	-.046	.031	.014	.016	.049	.165	-.054	.152	.215	.007	.089	-.085	.021
L819-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L819-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB8	1.94	1.10	9.26	65.0	1306	603	9.38	5.24	20.9	.062	-.007	6.75	1.21	1.23	.009	-.028	18.1	.021	.009	47.4	7.88	.900	1.18	1.39	.967	6.27	1.01	29.1	1.52
L821-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L821-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L823-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB9	.205	.017	3.47	68.5	2.54	1.74	6.72	3.87	-.014	.065	-.002	.009	1.05	.009	.007	-.026	-.085	.042	.043	.021	.041	.017	-.023	.079	.172	.014	.082	-.083	.018
IML033SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML033SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML033SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01M	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01S	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-01J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-02	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-03	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB10	.047	.013	1.25	44.9	2.41	1.84	5.01	5.09	.015	.049	-.003	.007	1.21	.011	.006	-.015	-.010	.017	.018	.030	.044	.012	-.100	.067	.294	.014	.077	-.074	.016
L280-04	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-05	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

L280-06	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-07	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-08	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-13	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB11	.058	.011	.396	40.4	2.90	2.37	6.15	5.78	.038	.025	-.006	.015	2.11	.011	.009	.001	.049	.010	.033	.036	.067	.017	-.121	.113	.306	.018	.052	-.026	.020
L280-14	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-15	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-16	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-18	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-19	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21A	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-21J	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV12	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB12	.078	.015	.430	35.0	3.51	2.93	4.40	5.87	.051	.046	.010	.023	2.57	.015	.019	-.001	.027	.038	.009	.040	.064	.018	-.077	.080	.310	.013	.074	-.051	.027
IML034SB	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML034SL	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
IML034SC	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
L280-22	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
ICSA3	.285	.011	1.53	----	----	----	----	----	----	.407	.703	2.97	----	.641	.926	2.02	5.79	.240	.050	1.77	----	.063	1.12	.149	.102	.809	.127	.431	.012
ICSAB3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
BLANK	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCV13	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
CCB13	.176	.012	.293	56.4	5.96	3.92	11.7	6.54	.115	.077	.010	.033	3.58	.016	.020	.035	-.019	.031	.035	.040	.113	.019	-.051	.090	.298	.032	.080	-.057	.032

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

APPENDIX B

Risk Exposure Calculation Tables

ERA.1
TIER-1 EXPOSURE ESTIMATES FOR MAMMALIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-1 Preliminary COPC [a/]	Soil RG [b/] (*mg/kg soil dw*)	Tier-1 Average Daily Dose (*mg COPC / kg $_{BW}$ --day*) [b/]			
		Pacific Pocket Mouse	Deer Mouse	Southern Grasshopper Mouse	Gray Fox
Inorganics					
Antimony	5.8	1.52E+00	1.09E+00	2.41E+00	4.96E-01
Arsenic	680	1.78E+02	1.28E+02	2.83E+02	5.81E+01
Barium	2205.8	5.78E+02	4.14E+02	9.18E+02	1.89E+02
Chromium (Total)	298	7.81E+01	5.59E+01	1.24E+02	2.55E+01
Copper	5360	1.41E+03	1.01E+03	2.23E+03	4.58E+02
Lead	72.8	1.91E+01	1.37E+01	3.03E+01	6.22E+00
Manganese	2945	7.72E+02	5.53E+02	1.23E+03	2.52E+02
Mercury	1.33	3.49E-01	2.50E-01	5.53E-01	1.14E-01
Thallium	1.38	3.62E-01	2.59E-01	5.74E-01	1.18E-01
Vanadium	2827	7.41E+02	5.31E+02	1.18E+03	2.42E+02
Zinc	254	6.66E+01	4.77E+01	1.06E+02	2.17E+01
Polychlorinated Biphenyls (PCBs)					
PCB-1254	1.48	3.88E-01	2.78E-01	6.16E-01	1.27E-01
PCB-1260	1.4	3.67E-01	2.63E-01	5.83E-01	1.20E-01
Polychlorinated Dibenzo-p-dioxin					
2,3,7,8-TCDD TEQ (Mammal)	0.000044	1.15E-05	8.26E-06	1.83E-05	3.76E-06

[a/] Tier-1 preliminary chemical of potential ecological concern.

[b/] The Tier 1 average daily dose is estimated according to:

Tier-1 ADD = (C_{soil} × T1-IR_F) + (C_{soil} × IR_S × T1-IR_F);

where:

C_{soil} = Soil EPC (mg COPC / kg soil dry weight);

T1-IR_F = Tier-1 food-ingestion rate (kg food dry weight / kg body weight -- day);

IR_S = Incidental-ingestion rate for soil (% of food-ingestion rate);

ERA.2
DERIVATION OF NOAEL-BASED TOXICITY REFERENCE VALUES FOR MAMMALS
Site 1A
MCB Camp Pendleton, California

Tier-1 Preliminary COPC [a/]	NOAEL-BASED TRVs										
	Test Species	Test Effect Dose (mg/kg_{BW}--day)	Test Endpoint	Study Duration	Exposure Route	Effect	Source	Study Duration UF [b/]	Endpoint UF [c/]	Total UF [d/]	NOAEL-Based TRV [e/] (mg/kg_{BW}--day)
Inorganics											
Antimony	Mouse	1.25	LOAEL	Lifetime	Drinking water	Longevity	Sample et al., 1996 (citing Schroeder et al., 1968)	1	5	5	0.25
Arsenic	Rat	0.32	NOAEL	Lifetime	Drinking water	Growth rates, survivial, blood pressure, tumors, hematology	EFA West, 1998 (citing Schroeder et al., 1968)	1	1	1	0.32
Barium	Rat	45	NOAEL	15 months	Drinking water	Increased kidney weight	USEPA, 2002a (citing NTP, 1994)	1	1	1	45
Chromium (Total)	Rat	1468	NOAEL	840 days	Diet	Reproductive effects (trivalent chromium as a surrogate)	USEPA, 2002a (citing Ivankovic and Preussman, 1975)	1	1	1	1468
Copper	Mouse	26.67	NOAEL	10 weeks	Drinking water	Food ingestion, body weight, thymus cell count, mortality	EFA West, 1998 (citing Pocino et al., 1991)	1	10	10	2.667
Lead	Rat	1	NOAEL	6-9 months	Drinking water	Renal effects	DTSC, 2002 (based primarily on Fowler et al., 1980)	1	1	1	1
Manganese	Mouse	136.56	EL	90 days	Diet	Effects in male reproductive organs	EFA West, 1998 (citing Gray and Laskey, 1980)	1	10	10	13.656
Mercury	Mink	0.27	EL	93 days	Diet	Anorexia, ataxia, and mortality	EFA West, 1998 (citing Wobeser et al., 1976) based on methylmercury; lowest available dose	1	10	10	0.027
Thallium	Rat	0.48	NOAEL	15 weeks	Diet	Hair loss	EFA West, 1998 (citing Downs et al., 1960)	1	1	1	0.48
Vanadium	Mouse	4.1	NOAEL	2 years	Diet	Cardiovascular, renal, respiratory, and hematological effects	ATSDR, 1992b (citing Schroeder and Balassa, 1967)	1	1	1	4.1
Zinc	Mouse	96.08	EL	14 months	Drinking water	Pancreatic and adrenal histology	EFA West, 1998 (citing Aughey et al., 1977)	1	10	10	9.608
Polychlorinated Biphenyls (PCBs)											
PCB-1254	White-footed Mouse	0.36	NOAEL	90 days	Diet	Liver weight, pentobarbitol-induced sleep time, hepatic enzyme activity	EFA West, 1998 (citing Simmons and McKee, 1992)	1	1	1	0.36
PCB-1260	White-footed Mouse	0.36	NOAEL	90 days	Diet	Liver weight, pentobarbitol-induced sleep time, hepatic enzyme activity	EFA West, 1998 (citing Simmons and McKee, 1992)	1	1	1	0.36
Polychlorinated Dibenzo-p-dioxins ar											

ERA.2
DERIVATION OF NOAEL-BASED TOXICITY REFERENCE VALUES FOR MAMMALS
Site 1A
MCB Camp Pendleton, California

	NOAEL-BASED TRVs										
Tier-1 Preliminary COPC [a/]	**Test Species**	**Test Effect Dose** ***(mg/kg $_{BW}$--day)***	**Test Endpoint**	**Study Duration**	**Exposure Route**	**Effect**	**Source**	**Study Duration UF** [b/]	**Endpoint UF** [c/]	**Total UF** [d/]	**NOAEL-Based TRV** [e/] ***(mg/kg $_{BW}$--day)***
2,3,7,8-TCDD TEQ (Mammal)	Rat	0.000001	NOAEL	3 generations	Oral in diet	Reproduction	Sample et al., 1996 (citing Murray et al., 1979)	1	1	1	0.000001

[a/] Tier-1 preliminary chemical of potential ecological concern.
[b/] Uncertainty factor (UF) to account for less-than-chronic durations.
[c/] Uncertainty factor (UF) to account for test endpoints other than NOAELs.
[d/] The prouduct of the duration and endpoint uncertainty factors.
[e/] NOAEL-based toxicity reference values (TRVs) were calculated by dividing the test effect dose by the Total UF.

ERA.3
TIER-1 HAZARD QUOTIENTS FOR MAMMALIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-1 Preliminary COPC [a/]	Pacific Pocket Mouse			Deer Mouse			Southern Grasshopper Mouse			Gray Fox		
	Tier-1 ADD (*mg/kg BW --day*)	Tier-1 (no-effect) TRV (*mg/kg BW --day*)	Tier-1 (no-effect) HQ (*dimensionless*)	Tier-1 ADD (*mg/kg BW --day*)	Tier-1 (no-effect) TRV (*mg/kg BW --day*)	Tier-1 (no-effect) HQ (*dimensionless*)	Tier-1 ADD (*mg/kg BW --day*)	Tier-1 (no-effect) TRV (*mg/kg BW --day*)	Tier-1 (no-effect) HQ (*dimensionless*)	Tier-1 ADD (*mg/kg BW --day*)	Tier-1 (no-effect) TRV (*mg/kg BW --day*)	Tier-1 (no-effect) HQ (*dimensionless*)
Inorganics												
Antimony	1.52E+00	2.50E-01	**6E+00**	1.09E+00	2.50E-01	**4E+00**	2.41E+00	2.50E-01	**1E+01**	4.96E-01	2.50E-01	**2E+00**
Arsenic	1.78E+02	3.20E-01	**6E+02**	1.28E+02	3.20E-01	**4E+02**	2.83E+02	3.20E-01	**9E+02**	5.81E+01	3.20E-01	**2E+02**
Barium	5.78E+02	4.50E+01	**1E+01**	4.14E+02	4.50E+01	**9E+00**	9.18E+02	4.50E+01	**2E+01**	1.89E+02	4.50E+01	**4E+00**
Chromium (Total)	7.81E+01	1.47E+03	5E-02	5.59E+01	1.47E+03	4E-02	1.24E+02	1.47E+03	8E-02	2.55E+01	1.47E+03	2E-02
Copper	1.41E+03	2.67E+00	**5E+02**	1.01E+03	2.67E+00	**4E+02**	2.23E+03	2.67E+00	**8E+02**	4.58E+02	2.67E+00	**2E+02**
Lead	1.91E+01	1.00E+00	**2E+01**	1.37E+01	1.00E+00	**1E+01**	3.03E+01	1.00E+00	**3E+01**	6.22E+00	1.00E+00	**6E+00**
Manganese	7.72E+02	1.37E+01	**6E+01**	5.53E+02	1.37E+01	**4E+01**	1.23E+03	1.37E+01	**9E+01**	2.52E+02	1.37E+01	**2E+01**
Mercury	3.49E-01	2.70E-02	**1E+01**	2.50E-01	2.70E-02	**9E+00**	5.53E-01	2.70E-02	**2E+01**	1.14E-01	2.70E-02	**4E+00**
Thallium	3.62E-01	4.80E-01	8E-01	2.59E-01	4.80E-01	5E-01	5.74E-01	4.80E-01	1E+00	1.18E-01	4.80E-01	2E-01
Vanadium	7.41E+02	4.10E+00	**2E+02**	5.31E+02	4.10E+00	**1E+02**	1.18E+03	4.10E+00	**3E+02**	2.42E+02	4.10E+00	**6E+01**
Zinc	6.66E+01	9.61E+00	**7E+00**	4.77E+01	9.61E+00	**5E+00**	1.06E+02	9.61E+00	**1E+01**	2.17E+01	9.61E+00	**2E+00**
Polychlorinated Biphenyls (PCB												
PCB-1254	3.88E-01	3.60E-01	1E+00	2.78E-01	3.60E-01	8E-01	6.16E-01	3.60E-01	**2E+00**	1.27E-01	3.60E-01	4E-01
PCB-1260	3.67E-01	3.60E-01	1E+00	2.63E-01	3.60E-01	7E-01	5.83E-01	3.60E-01	**2E+00**	1.20E-01	3.60E-01	3E-01
Polychlorinated Dibenzo-p-diox												
2,3,7,8-TCDD TEQ (Mammal)	1.15E-05	1.00E-06	**1E+01**	8.26E-06	1.00E-06	**8E+00**	1.83E-05	1.00E-06	**2E+01**	3.76E-06	1.00E-06	**4E+00**

[a/] Tier-1 preliminary chemical of potential ecological concern.

Bold values indicate an HQ >1.

ERA.4
TIER-1 EXPOSURE ESTIMATES FOR AVIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-1 Preliminary COPC [a/]	Soil RG [b/] (*mg/kg soil dw*)	Tier 1 Average Daily Dose (*mg COPC / kg $_{BW}$ --day*) [b/]			
		California Quail	Horned Lark	Least Bell's Vireo	Red-tailed Hawk
Inorganics					
Antimony	5.8	1.72E+00	1.89E+00	2.48E+00	5.15E-01
Arsenic	680	2.02E+02	2.22E+02	2.91E+02	6.03E+01
Barium	2205.8	6.55E+02	7.20E+02	9.43E+02	1.96E+02
Chromium (Total)	298	8.85E+01	9.73E+01	1.27E+02	2.64E+01
Copper	5360	1.59E+03	1.75E+03	2.29E+03	4.76E+02
Lead	72.8	2.16E+01	2.38E+01	3.11E+01	6.46E+00
Manganese	2945	8.74E+02	9.61E+02	1.26E+03	2.61E+02
Mercury	1.33	3.95E-01	4.34E-01	5.68E-01	1.18E-01
Thallium	1.38	4.10E-01	4.50E-01	5.90E-01	1.22E-01
Vanadium	2827	8.39E+02	9.23E+02	1.21E+03	2.51E+02
Zinc	254	7.54E+01	8.29E+01	1.09E+02	2.25E+01
Polychlorinated Biphenyls (PCB					
PCB-1254	1.48	4.39E-01	4.83E-01	6.33E-01	1.31E-01
PCB-1260	1.4	4.16E-01	4.57E-01	5.98E-01	1.24E-01
Polychlorinated Dibenzo-p-dioxi					
2,3,7,8-TCDD TEQ (Bird)	0.00016	4.75E-05	5.22E-05	6.84E-05	1.42E-05

[a/] Tier-1 preliminary chemical of potential ecological concern.

[b/] The Tier 1 average daily dose is estimated according to:

$$\text{Tier-1 ADD} = (C_{soil} \times \text{T1-IR}_F) + (C_{soil} \times IR_S \times \text{T1-IR}_F);$$

where:

C_{soil} = soil EPC (mg COPC / kg soil dry weight);

T1-IR_F = Tier-1 food-ingestion rate (kg food dry weight / kg body weight -- day);

IR_S = Incidental-ingestion rate for soil (% of food-ingestion rate);

ERA.5
DERIVATION OF NOAEL-BASED TOXICITY REFERENCE VALUES FOR BIRDS
Site 1A
MCB Camp Pendleton, California

	NOAEL-BASED TRVs										
Tier-1 Preliminary COPC [a/]	**Test Species**	**Test Effect Dose ($mg/kg_{BW}day$) [b/]**	**Test Endpoint [c/]**	**Study Duration**	**Exposure Route**	**Effect**	**Source**	**Study Duration UF [b/]**	**Endpoint UF [c/]**	**Total UF [d/]**	**NOAEL-Based TRV (mg/kg_{BW}--day) [e/]**
Inorganics											
Antimony	Red-winged blackbird	100	LD50	Acute	Oral	Mortality (LD50 > 100 mg/kg) (antimony potassium tartrate as chemical surrogate)	Schafer et al., 1983	15	15	225	0.444444444
Arsenic	Mallard	5.5	NOAEL	4 weeks + hatching cycles	Diet	Reproductive effects	EFA West, 1998 (citing Stanley et al., 1994)	1	1	1	5.5
Barium	Chicken	208.26	NOAEL	4 weeks	Diet	Mortality	Sample et al., 1996 (citing Johnson et al., 1960)	5	1	5	41.652
Chromium (Total)	Black duck	1	NOAEL	10 months	Diet	Reproductive effects [based on Cr(III)]	Sample et al., 1996 (citing Haseltine et al., 1985)	1	1	1	1
Copper	Chicken	22.99	NOAEL	8 weeks	Diet	Weight gain	EFA West, 1998 (citing Norvell et al., 1975)	10	1	10	2.299
Lead	Japanese quail	0.14	EL	12 weeks	Diet	Reproductive effects	EFA West, 1998 (citing Edens et al., 1976)	1	10	10	0.014
Manganese	Japanese quail	776	EL	75-80 days	Diet	Behavior	EFA West, 1998 (citing Laskey and Edens, 1985)	1	10	10	77.6
Mercury	Mallard	0.078	LOAEL	3 generations	Diet	Reproduction	EFA West, 1998 (citing Heinz 1974, 1975, 1976a, 1976b, 1979) based on Methylmercury	1	2	2	0.039
Thallium	Pheasant	23.7	LD50	Acute	Diet	Mortality	Hudson et al., 1984	15	15	225	0.105333333
Vanadium	Mallard	11.4	NOAEL	12 weeks	Diet	Mortality, body weight, blood chemistry	Sample et al., 1996 (citing White and Dieter, 1978)	1	1	1	11.4
Zinc	Mallard	172	EL	60 days	Diet	Decreased body and organ weights, body:organ weight ratios, leg paralysis, diarrhea	EFA West, 1998 (citing Gasaway and Buss, 1972)	1	10	10	17.2
Polychlorinated Biphenyls (PCBs)											
PCB-1254	Chicken	0.88	EL	39 weeks	Diet	Egg production	EFA West, 1998 (citing Platonow and Reinhart, 1973)	1	10	10	0.088

ERA.5
DERIVATION OF NOAEL-BASED TOXICITY REFERENCE VALUES FOR BIRDS
Site 1A
MCB Camp Pendleton, California

	NOAEL-BASED TRVs										
Tier-1 Preliminary COPC [a/]	**Test Species**	**Test Effect Dose** ($mg/kg_{BW}day$) [b/]	**Test Endpoint** [c/]	**Study Duration**	**Exposure Route**	**Effect**	**Source**	**Study Duration UF** [b/]	**Endpoint UF** [c/]	**Total UF** [d/]	**NOAEL-Based TRV** (mg/kg_{BW}--day) [e/]
PCB-1260	Chicken	0.88	EL	39 weeks	Diet	Egg production	EFA West, 1998 (citing Platonow and Reinhart, 1973)	1	10	10	0.088
Polychlorinated Dibenzo-p-dioxins and											
2,3,7,8-TCDD TEQ (Bird)	Ring-	0.000014	NOAEL	10 weeks, including	Injection	Reproduction	Sample et al., 1996	1	1	1	0.000014

[a/] Tier-1 preliminary chemical of potential ecological concern.
[b/] Uncertainty factor (UF) to account for less-than-chronic durations.
[c/] Uncertainty factor (UF) to account for test endpoints other than NOAELs.
[d/] The prouduct of the duration and endpoint uncertainty factors.
[e/] NOAEL-based toxicity reference values (TRVs) were calculated by dividing the test effect dose by the Total UF.
[g/] Toxicity data are not available; the chemical will be further addressed in the uncertainty section.

ERA.6
TIER-1 HAZARD QUOTIENTS FOR AVIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-1 Preliminary COPC [a/]	California Quail Tier-1 ADD (mg/kg BW --day)	California Quail Tier-1 (no-effect) TRV (mg/kg BW --day)	California Quail Tier-1 (no-effect) HQ (dimensionless)	Horned Lark Tier-1 ADD (mg/kg BW --day)	Horned Lark Tier-1 (no-effect) TRV (mg/kg BW --day)	Horned Lark Tier-1 (no-effect) HQ (dimensionless)	Least Bell's Vireo Tier-1 ADD (mg/kg BW --day)	Least Bell's Vireo Tier-1 (no-effect) TRV (mg/kg BW --day)	Least Bell's Vireo Tier-1 (no-effect) HQ (dimensionless)	Red-tailed Hawk Tier-1 ADD (mg/kg BW --day)	Red-tailed Hawk Tier-1 (no-effect) TRV (mg/kg BW --day)	Red-tailed Hawk Tier-1 (no-effect) HQ (dimensionless)
Inorganics												
Antimony	1.72E+00	4.44E-01	**4E+00**	1.89E+00	4.44E-01	**4E+00**	2.48E+00	4.44E-01	**6E+00**	5.15E-01	4.44E-01	1E+00
Arsenic	2.02E+02	5.50E+00	**4E+01**	2.22E+02	5.50E+00	**4E+01**	2.91E+02	5.50E+00	**5E+01**	6.03E+01	5.50E+00	**1E+01**
Barium	6.55E+02	4.17E+01	**2E+01**	7.20E+02	4.17E+01	**2E+01**	9.43E+02	4.17E+01	**2E+01**	1.96E+02	4.17E+01	**5E+00**
Chromium (Total)	8.85E+01	1.00E+00	**9E+01**	9.73E+01	1.00E+00	**1E+02**	1.27E+02	1.00E+00	**1E+02**	2.64E+01	1.00E+00	**3E+01**
Copper	1.59E+03	2.30E+00	**7E+02**	1.75E+03	2.30E+00	**8E+02**	2.29E+03	2.30E+00	**1E+03**	4.76E+02	2.30E+00	**2E+02**
Lead	2.16E+01	1.40E-02	**2E+03**	2.38E+01	1.40E-02	**2E+03**	3.11E+01	1.40E-02	**2E+03**	6.46E+00	1.40E-02	**5E+02**
Manganese	8.74E+02	7.76E+01	**1E+01**	9.61E+02	7.76E+01	**1E+01**	1.26E+03	7.76E+01	**2E+01**	2.61E+02	7.76E+01	**3E+00**
Mercury	3.95E-01	3.90E-02	**1E+01**	4.34E-01	3.90E-02	**1E+01**	5.68E-01	3.90E-02	**1E+01**	1.18E-01	3.90E-02	**3E+00**
Thallium	4.10E-01	1.05E-01	**4E+00**	4.50E-01	1.05E-01	**4E+00**	5.90E-01	1.05E-01	**6E+00**	1.22E-01	1.05E-01	1E+00
Vanadium	8.39E+02	1.14E+01	**7E+01**	9.23E+02	1.14E+01	**8E+01**	1.21E+03	1.14E+01	**1E+02**	2.51E+02	1.14E+01	**2E+01**
Zinc	7.54E+01	1.72E+01	**4E+00**	8.29E+01	1.72E+01	**5E+00**	1.09E+02	1.72E+01	**6E+00**	2.25E+01	1.72E+01	1E+00
Polychlorinated Biphenyls (												
PCB-1254	4.39E-01	8.80E-02	**5E+00**	4.83E-01	8.80E-02	**5E+00**	6.33E-01	8.80E-02	**7E+00**	1.31E-01	8.80E-02	1E+00
PCB-1260	4.16E-01	8.80E-02	**5E+00**	4.57E-01	8.80E-02	**5E+00**	5.98E-01	8.80E-02	**7E+00**	1.24E-01	8.80E-02	1E+00
Polychlorinated Dibenzo-p-d												
2,3,7,8-TCDD TEQ (Bird)	4.75E-05	1.40E-05	**3E+00**	5.22E-05	1.40E-05	**4E+00**	6.84E-05	1.40E-05	**5E+00**	1.42E-05	1.40E-05	1E+00

[a/] Tier-1 preliminary chemical of potential ecological concern.

Bold values indicate an HQ >1.

ERA.7
PREDICTED CONCENTRATIONS OF TIER-2 COPCS IN PLANTS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Log Kow[b/]	Soil RG: Csoil (*mg COPC / kg soil dw*)	Uptake Parameters: PUF(dw) [d/] (*kg soil dw / kg plant dw*)	B1[e/]	B0 [f/]	Source	Prediction of Exposure-Point Concentration (EPC) in Plants: Cplant(dw) g/ (*mg Tier-2 COPC / kg plant dw*)
Inorganics							
Antimony	NA	5.8	0.2			Figure 2.1, Baes et al., 1984	1.16E+00
Arsenic	NA	680		0.564	-1.992	Table 7, BJC, 1998	5.40E+00
Barium	NA	2205.8	0.15			Figure 2.1, Baes et al., 1984	3.31E+02
Chromium (Total)	NA	298	0.0075			Figure 2.1, Baes et al., 1984	2.24E+00
Copper	NA	5360		0.394	0.669	Table 7, BJC, 1998	5.75E+01
Lead	NA	72.8		0.561	-1.328	Table 7, BJC, 1998	2.94E+00
Manganese	NA	2945	0.25			Figure 2.1, Baes et al., 1984	7.36E+02
Mercury	NA	1.33		0.544	-0.996	Table 7, BJC, 1998	4.31E-01
Thallium	NA	1.38	0.004			Figure 2.1, Baes et al., 1984	5.52E-03
Vanadium	NA	2827	0.0055			Figure 2.1, Baes et al., 1984	1.55E+01
Zinc	NA	254		0.555	1.575	Table 7, BJC, 1998	1.04E+02
Polychlorinated Biphenyls (PCE							
PCB-1254	6.3	1.48	0.008843008			Equation 5, Travis and Arms, 1988	1.31E-02
PCB-1260	6.8	1.4	0.004545692			Equation 5, Travis and Arms, 1988	6.36E-03
Polychlorinated Dibenzo-p-diox							
2,3,7,8-TCDD TEQ (Bird)	6.5	0.00016	0.006776415			Equation 5, Travis and Arms, 1988	1.08E-06
2,3,7,8-TCDD TEQ (Mammal)	6.5	0.000044	0.006776415			Equation 5, Travis and Arms, 1988	2.98E-07

[a/] Tier-2 preliminary chemical of potential ecological concern.

[b/] Kow = Octanol:water partitioning coefficient; Kow values are not applicable ("NA") for inorganics.

[c/] The exposure-point concentration for soil is from the 0-5 ft bgs soil interval.

[d/] PUF = Plant uptake factor, based on dry-weight data.

[e/] B0 = Mathematical constant (slope) from the regression of natural-log transformed biota concentration on the natural-log-transformed soil concentration.

[f/] B1 = Mathematical constant (Y-intercept) from the regresion of natural-log-transformed biota concentration on the natural-log-transformed soil concentration.

[g/] If a PUF is available, plant concentration is estimated according to:

$$C_{plant(dw)} = \text{Soil EPC} \times \text{PUF(dw)}$$

If plant concentration is derived from a regression relationship, plant concentration is estimated according to:

$$C_{plant(dw)} = (\text{Soil EPC})^{B1} \times e^{B0}$$

ERA.8
PREDICTED CONCENTRATIONS OF TIER-2 COPCS IN SOIL INVERTEBRATES (EARTHWORMS)
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Log Kow[b/]	Remedial Goal (RG) C_{soil} (*mg COPC / kg soil dw*)	Uptake Parameters: $BAF_{invertebrate}$ (dw) [c/] (*kg soil dw / kg invertebrate dw*)	$BAF_{invertebrate}$ (ww) [c/] (*kg soil dw / kg invertebrate ww*)	B1 [d/]	B0 [e/]	Source	$(dw:ww)_{invertebrate}$ [f/] (*kg invertebrate dw / kg invertebrate ww*)	Prediction of Exposure-Point Concentration (EPC) in Invertebrates $C_{invertebrate(dw)}$ [g/] (*mg Tier-2 COPC / kg invertebrate dw*)
Inorganics									
Antimony	NA	5.8		0.220			Table C-1, USEPA, 1999a	0.32	3.99E+00
Arsenic	NA	680			0.706	-1.421	Table 12, Sample et al., 1998a	0.32	2.41E+01
Barium	NA	2205.8	0.091				Table C.1, Sample et al., 1998a	0.32	2.01E+02
Chromium (Total)	NA	298		0.010			Table C-1, USEPA, 1999a	0.32	9.31E+00
Copper	NA	5360			0.264	1.675	Table 12, Sample et al., 1998a	0.32	5.15E+01
Lead	NA	72.8			0.807	-0.218	Table 12, Sample et al., 1998a	0.32	2.56E+01
Manganese	NA	2945			0.682	-0.809	Table 12, Sample et al., 1998a	0.32	1.03E+02
Mercury	NA	1.33			0.118	-0.684	Table 12, Sample et al., 1998a	0.32	5.22E-01
Thallium	NA	1.38		0.220			Table C-1, USEPA, 1999a	0.32	9.49E-01
Vanadium	NA	2827	0.042				Table C.1, Sample et al., 1998a	0.32	1.19E+02
Zinc	NA	254			0.328	4.449	Table 12, Sample et al., 1998a	0.32	5.26E+02
Polychlorinated Biphenyls (PCB									
PCB-1254	6.3	1.48	2.629				Equation 8, Connell and Markwell, 1990 i/	0.32	3.89E+00
PCB-1260	6.8	1.4	2.784				Equation 8, Connell and Markwell, 1990 i/	0.32	3.90E+00
Polychlorinated Dibenzo-p-dioxi									
2,3,7,8-TCDD TEQ (Bird)	6.5	0.00016	2.690				Equation 8, Connell and Markwell, 1990 i/	0.32	4.30E-04
2,3,7,8-TCDD TEQ (Mammal)	6.5	0.000044	2.690				Equation 8, Connell and Markwell, 1990 i/	0.32	1.18E-04

[a/] Tier-2 preliminary chemical of potential ecological concern.

[b/] Kow = Octanol:water partitioning coefficient; Kow values are not applicable ("NA") for inorganics.

[c/] $BAF_{invertebrate}$ = Bioaccumulation factor for invertebrates, based on dry- or wet-weight concentrations (as indicated).

[d/] B1 = Mathematical constant (slope) from the regression of natural-log transformed biota concentration on the natural-log-transformed soil concentration.

[e/] B0 = Mathematical constant (Y-intercept) from the regresion of natural-log-transformed biota concentration on the natural-log-transformed soil concentration.

[f/] Dry-weight mass of invertebrate per wet-weight mass of invertebrate, equivalent to 68-percent moisture (Table 5-1, USEPA, 1999a).

[g/] If a BAF(dw) is available, invertebrate concentration is estimated according to:

$C_{invertebrate(dw)} =$ Soil EPC × BAF(dw);

if a BAF(ww) is available, invertebrate concentration is estimated according to:

$C_{invertebrate(dw)} =$ {Soil EPC × BAF(ww)} ÷ $(dw:ww)_{invertebrate}$; and

if invertebrate concentration is derived from a regression relationship, invertebrate concentration is estimated according to:

$C_{invertebrate(dw)} = (\text{Soil EPC})^{B1} \times e^{B0}$.

[i/] Invertebrate BAFs are strongly dependent upon the lipid content of earthworms and the organic-carbon content of soil and are weakly dependent upon Kow (Connell and Markwell, 1990);
for the Tier 2 ERA, lipid content (Y_L) of earthworms was assumed to be 0.84-percent and the proportionality constant (x) was assumed to be 0.66 (Connell and Markwell, 1990); the organic-carbon content of soil (f_{OC}) was assumed to be 1-percer
BAFs were calculated according to Connell and Markwell (1990; Equation 8):

$BAF = [\, Y_L / (x \times f_{OC}) \,] \times Kow^{0.05}$

ERA.9
PREDICTED CONCENTRATIONS OF TIER-2 COPCS IN SMALL-MAMMAL PREY
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Log Kow[b/]	Remedial Goals (RGs): 0-1.5 ft bgs Soil (*mg COPC / kg soil dw*)	Remedial Goals (RGs): $C_{plant(dw)}$ (*mg COPC / kg plant dw*)	Remedial Goals (RGs): $C_{invertebrate(dw)}$ (*mg COPC / kg invertebrate dw*)	Uptake Parameters: F_f or B_b [c/] (*day / kg muscle ww*)	Uptake Parameters: $BAF_{small\ mammal}$ (dw) [d/] (*kg soil dw / kg small mammal dw*)	Uptake Parameters: B1 [e/]	Uptake Parameters: B0 [f/]	Uptake Parameters: Source	$(dw:ww)_{small\ mammal}$ [g/] (*kg small mammal dw / kg small mammal ww*)	Prediction of Exposure-Point Concentration (EPC) in Small-Mammal Prey [h/]: $C_{small\ mammal(dw)}$ (*mg COPC / kg small mammal dw*)
Inorganics											
Antimony	NA	5.8	1.16E+00	3.99E+00	0.001				Figure 2.25, Baes et al., 1984	0.32	2.65E-05
Arsenic	NA	680	5.40E+00	2.41E+01			0.8188	-4.8471	Table 8, Sample et al., 1998b	0.32	1.64E+00
Barium	NA	2205.8	3.31E+02	2.01E+02		0.0566			Table 7, Sample et al., 1998b	0.32	1.25E+02
Chromium (Total)	NA	298	2.24E+00	9.31E+00			0.7338	-1.4599	Table 8, Sample et al., 1998b	0.32	1.52E+01
Copper	NA	5360	5.75E+01	5.15E+01			0.1444	2.042	Table 8, Sample et al., 1998b	0.32	2.66E+01
Lead	NA	72.8	2.94E+00	2.56E+01			0.4422	0.0761	Table 8, Sample et al., 1998b	0.32	7.19E+00
Manganese	NA	2945	7.36E+02	1.03E+02		0.0205			Table C.1, Sample et al., 1998b	0.32	6.04E+01
Mercury	NA	1.33	4.31E-01	5.22E-01		0.0543			Table 7, Sample et al., 1998b	0.32	7.22E-02
Thallium	NA	1.38	5.52E-03	9.49E-01		0.1124			Table 7, Sample et al., 1998b	0.32	1.55E-01
Vanadium	NA	2827	1.55E+01	1.19E+02		0.0123			Table C.1, Sample et al., 1998b	0.32	3.48E+01
Zinc	NA	254	1.04E+02	5.26E+02			0.0738	4.4713	Table 8, Sample et al., 1998b	0.32	1.32E+02
Polychlorinated Biphenyls (PCBs)											
PCB-1254	6.3	1.48	1.31E-02	3.89E+00	0.050118723				Equation 2, Travis and Arms, 1988	0.32	1.01E-03
PCB-1260	6.8	1.4	6.36E-03	3.90E+00	0.158489319				Equation 2, Travis and Arms, 1988	0.32	3.19E-03
Polychlorinated Dibenzo-p-dioxins											
2,3,7,8-TCDD TEQ (Bird)	6.5	0.00016	1.08E-06	4.30E-04	0.079432823				Equation 2, Travis and Arms, 1988	0.32	1.77E-07
2,3,7,8-TCDD TEQ (Mammal)	6.5	0.000044	2.98E-07	1.18E-04	0.079432823				Equation 2, Travis and Arms, 1988	0.32	4.86E-08

[a/] Tier-2 preliminary chemical of potential ecological concern.

[b/] Kow = Octanol:water partitioning coefficient; NA = not applicable for inorganics.

[c/] F_f (food factor) = Fraction of daily ingested activity concentration (from feeding) which is transferred to and remains in a Kg of [cow] muscle at equilibrium (Baes *et al.*, 1984);
B_b (biotransfer factor for beef) = the measured concentration of organic in beef (mg organic / kg meat ww) divided by the daily intake of organic (mg organic / day) (Travis and Arms, 1988);
for the Tier-2 ERA, it is assumed that [cow] muscle (ww) and beef (ww) are equivalent to small-mammal body weight (ww) when small mammals are consumed as prey.

[d/] $BAF_{small\ mamma}$ (dw) = Median bioaccumulation factor for the "general" trophic-group of small mammals, on a dry weight basis.

[e/] B0 = Mathematical constant (Y-intercept) from the regression of natural-log transformed biota concentration on the natural-log-transformed soil concentration for the "general" trophic group of small mammals.

[f/] B1 = Mathematical constant (slope) from the regresion of natural-log-transformed biota concentration on the natural-log-transformed soil concentration from the "general" trophic-group of small mammals.

[g/] Dry-weight mass of small mammal per wet-weight mass of small mammal, equivalent to 68-percent moisture (Table 4-1, USEPA, 1993).

[h/] If an F_f or B_b is available, it is assumed that the small-mammal prey is the deer mouse (as a representative omnivore), and the concentration in small-mammal prey is estimated according to:

$$C_{small\ mammal(dw)} = [\{C_{plant(dw)} \times F_f \times df_p \times (T2\text{-}IR_F \times BW)\} + \{C_{invertebrate(dw)} \times F_f \times df_I \times (T2\text{-}IR_F \times BW)\}] \div (dw:ww)_{small\ mammal};$$

where:

$C_{small\ mammal(dw)}$ = concentration in small-mammal prey (mg final COPC / kg small mammal dw);
$C_{plant(dw)}$ = concentration in plants (mg COPC / kg plant dw);
F_f (or B_b) = food factor (day / kg small mammal ww);
dfp = dietary fraction of plant material for the Deer Mouse (50%);
T2-IRF = Tier-2 food ingestion rate for the Deer Mouse (0.165 kg food dry weight / kg body weight -- day);
BW = body weight of the Deer Mouse (0.02 kg);
$C_{invertebrate(dw)}$ = concentration in invertebrate prey (mg COPC / kg invertebrate dw);
dfI = dietary fraction of invertebrates for the Deer Mouse (50%); and
(dw:ww)small mammal = dry-weight to wet-weight conversion factor (0.32 kg small mammal dw / kg small mammal ww).

if a BAF(dw) is available, small-mammal concentration is estimated according to:

$$C_{small\ mammal(dw)} = \text{Soil EPC} \times \text{BAF(dw)}; \text{ and}$$

if small-mammal concentration is derived from a regression relationship, small-mammal concentration is estimated according to:

$$C_{small\ mammal(dw)} = (\text{Soil EPC})^{B1} \times e^{B0}.$$

ERA.10
TIER-2 EXPOSURE ESTIMATES FOR MAMMALIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 COPC [a/]	Soil RG [b/]		Food-item EPCs			Tier-2 Average Daily Dose [c/] (*mg COPC / kg* $_{BW}$ *--day*)			
	0-1.5 ft bgs (*mg/kg soil dw*)	**0-5 ft bgs** (*mg/kg soil dw*)	**Plant** (*mg/kg soil dw*)	**Invertebrate** (*mg/kg soil dw*)	**Small-mammal Prey** (*mg/kg soil dw*)	**Pacific Pocket Mouse**	**Deer Mouse**	**Southern Grasshopper Mouse**	**Gray Fox**
Inorganics									
Antimony	5.8	5.8	1.16E+00	3.99E+00	2.65E-05	2.55E-01	4.44E-01	2.70E-01	8.68E-05
Arsenic	680	680	5.40E+00	2.41E+01	1.64E+00	3.80E+00	4.68E+00	2.51E+00	8.31E-03
Barium	2205.8	2205.8	3.31E+02	2.01E+02	1.25E+02	7.50E+01	5.11E+01	1.72E+01	7.53E-02
Chromium (Total)	298	298	2.24E+00	9.31E+00	1.52E+01	1.64E+00	1.94E+00	1.02E+00	8.78E-03
Copper	5360	5360	5.75E+01	5.15E+01	2.66E+01	3.29E+01	2.67E+01	1.09E+01	7.07E-02
Lead	72.8	72.8	2.94E+00	2.56E+01	7.19E+00	8.79E-01	2.59E+00	1.77E+00	3.43E-03
Manganese	2945	2945	7.36E+02	1.03E+02	6.04E+01	1.59E+02	7.90E+01	1.32E+01	6.83E-02
Mercury	1.33	1.33	4.31E-01	5.22E-01	7.22E-02	9.16E-02	8.30E-02	3.71E-02	4.87E-05
Thallium	1.38	1.38	5.52E-03	9.49E-01	1.55E-01	6.62E-03	8.33E-02	6.34E-02	7.07E-05
Vanadium	2827	2827	1.55E+01	1.19E+02	3.48E+01	1.44E+01	2.04E+01	1.16E+01	4.44E-02
Zinc	254	254	1.04E+02	5.26E+02	1.32E+02	2.19E+01	5.28E+01	3.48E+01	5.16E-02
Polychlorinated Biphenyls (PCBs									
PCB-1254	1.48	1.48	1.31E-02	3.89E+00	1.01E-03	8.54E-03	3.27E-01	2.54E-01	1.72E-05
PCB-1260	1.4	1.4	6.36E-03	3.90E+00	3.19E-03	6.87E-03	3.27E-01	2.55E-01	1.70E-05

ERA.10
TIER-2 EXPOSURE ESTIMATES FOR MAMMALIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 COPC [a/]	Soil RG [b/]		Food-item EPCs			Tier-2 Average Daily Dose [c/] (*mg COPC / kg* $_{BW}$ *--day*)			
	0-1.5 ft bgs (*mg/kg soil dw*)	**0-5 ft bgs** (*mg/kg soil dw*)	**Plant** (*mg/kg soil dw*)	**Invertebrate** (*mg/kg soil dw*)	**Small-mammal Prey** (*mg/kg soil dw*)	**Pacific Pocket Mouse**	**Deer Mouse**	**Southern Grasshopper Mouse**	**Gray Fox**
Polychlorinated Dibenzo-p-dioxin									
2,3,7,8-TCDD TEQ (Mammal)	0.000044	0.000044	2.98E-07	1.18E-04	4.86E-08	2.36E-07	9.93E-06	7.74E-06	5.17E-10

[a/] Tier-2 chemical of potential ecological concern.

[b/] For the Tier-2 assessment, the soil exposure-point concentration (EPC) is the 95%UCL-M or the maximum detected concentration, whichever is less, in the indicated soil interval.

[c/] The Tier 2 average daily dose is estimated according to:

$$\text{Tier-2 ADD} = \{ \text{T2-IR}_F \times [(C_{plant(dw)} \times df_{plant}) + (C_{invertebrate(dw)} \times df_I) + (C_{small\ mammal(dw)} \times df_M) + (C_{soil} \times IR_S)] \times AUF \};$$

where:

T2-IR_F = Tier-2 food-ingestion rate (kg food dry weight / kg body weight -- day);

$C_{plant(ww)}$ = plant EPC (mg COPC / kg plant dw);

df_P = dietary fraction of plant-matter (%);

$C_{invertebrate(dw)}$ = invertebrate EPC (mg COPC / kg invertebrate dw);

df_I = dietary fraction of invertebrates (%);

$C_{small\ mammal(dw)}$ = small-mammal prey EPC (mg COPC / kg small mammal dw);

df_M = dietary fraction of small mammals (%);

Csoil = soil EPC (mg COPC / kg soil dry weight, using the 0-1.5 ft bgs interval for the Pacific Pocket Mouse, Deer Mouse and Southern Grasshopper Mouse, and the 0-5 ft bgs interval for the Gray F

IR_S = Incidental-ingestion rate for soil (%)

AUF = area use factor (maximum value = 1); ratio of site exposure area (3 acres) to average foraging range of the receptor:

Pacific Pocket Mouse: foraging area = 0.85 acre, AUF = 1;

Deer Mouse: foraging area = 0.6 acre, AUF = 1;

Southern Grasshopper Mouse: foraging area = 6.9 acre, AUF = 0.435;

Gray Fox: foraging area = 385 acre, AUF = 0.008;

ERA.11
DERIVATION OF EFFECT-BASED TOXICITY REFERENCE VALUES FOR MAMMALS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	EFFECT-BASED TRVs										
	Test Species	Test Effect Dose (*mg/kg $_{BW}$ --day*)	Test Endpoint [c/]	Study Duration	Exposure Route	Effect	Source	Study Duration UF [b/]	Endpoint UF [c/]	Total UF [d/]	Effect-Based TRV (*mg/kg $_{BW}$ --day*) [e/]
Inorganics											
Antimony	Mouse	1.25	LOAEL	Lifetime	Drinking water	Longevity	Sample et al., 1996 (citing Schroeder et al., 1968)	1	1	1	1.25
Arsenic	Rat	4.7	EL	27 month	Diet	Hematological, hepatic, and body weight effects; based on lead arsenate [As(V)]	EFA West, 1998 (citing Brown et al., 1976)	1	1	1	4.7
Barium	Rat	75	LOAEL	15 months	Drinking water	Increased kidney weight	USEPA, 2002a (citing NTP, 1994)	1	1	1	75
Chromium (Total)	Rat	1468	NOAEL	840 days	Diet	Reproductive effects (trivalent chromium as a surrogate)	USEPA, 2002a (citing Ivankovic and Preussman, 1975)	1	0.2	0.2	7340
Copper	Mouse	631.58	LOAEL	2 weeks	Drinking water	Decreased water consumption and body weight, increased mortality	EFA West, 1998 (citing Hebert et al., 1993)	1	1	1	631.58
Lead	Mouse	240.64	EL	8 days	Diet	Decreased body weight, liver weight, and kidney weight	EFA West, 1998 (citing Wise, 1981)	1	1	1	240.64
Manganese	Mouse	159.09	EL	73 days	Diet	Effects in male reproductive organs	EFA West, 1998 (citing Gray and Laskey, 1980)	1	1	1	159.09
Mercury	Mink	0.27	LOAEL	93 days	Diet	Anorexia, ataxia, and mortality	EFA West, 1998 (citing Wobeser et al., 1976)	1	1	1	0.27
Thallium	Rat	1.43	LOAEL	15 weeks	Diet	Hair loss	EFA West, 1998 (citing Downs et al., 1960)	1	1	1	1.43
Vanadium	Mouse	4.1	NOAEL	2 years	Diet	Cardiovascular, renal, respiratory, and hematological effects	ATSDR, 1992b (citing Schroeder and Balassa, 1967)	1	0.2	0.2	20.5
Zinc	Rat	411.43	LOAEL	36 days	Diet	Fetal development	EFA West, 1998 (citing Aughey et al., 1977)	1	1	1	411.43

ERA.11
DERIVATION OF EFFECT-BASED TOXICITY REFERENCE VALUES FOR MAMMALS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	EFFECT-BASED TRVs										
	Test Species	Test Effect Dose (*mg/kg $_{BW}$ --day*)	Test Endpoint [c/]	Study Duration	Exposure Route	Effect	Source	Study Duration UF [b/]	Endpoint UF [c/]	Total UF [d/]	Effect-Based TRV (*mg/kg $_{BW}$ --day*) [e/]
Polychlorinated Biphenyls (PCB											
PCB-1254	White-footed Mouse	1.28	EL	9-15 months	Diet	Reduced reproductive capacity	EFA West, 1998 (citing Linzey, 1987)	1	1	1	1.28
PCB-1260	White-footed Mouse	1.28	EL	9-15 months	Diet	Reduced reproductive capacity	EFA West, 1998 (citing Linzey, 1987)	1	1	1	1.28
Polychlorinated Dibenzo-p-dioxi											
2,3,7,8-TCDD TEQ (Bird)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
2,3,7,8-TCDD TEQ (Mammal)	Rat	0.00001	LOAEL	3 generations	Oral in diet	Reproduction	Sample et al., 1996 (citing Murray et al., 1979)	1	1	1	0.00001

[a/] Tier-2 preliminary chemical of potential ecological concern.
[b/] Uncertainty factor (UF) to account for less-than-chronic durations.
[c/] Uncertainty factor (UF) to account for test endpoints other than LOAELs.
[d/] The prouduct of the duration and endpoint uncertainty factors.
[e/] Effect-based toxicity reference values (TRVs) were calculated by dividing the test effect dose by the Total UF.

ERA.12
TIER-2 (SITE-SPECIFIC) HAZARD QUOTIENTS FOR MAMMALIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

	Pacific Pocket Mouse					Deer Mouse				
		Tier-1 (no-effect)		Tier-2 (effect)			Tier-1 (no-effect)		Tier-2 (effect)	
Tier-2 Preliminary COPC	**Tier-2 ADD** (*mg/kgBW--day*)	**TRV** (*mg/kgBW--day*)	**No-effect HQ** (*dimensionless*)	**TRV** (*mg/kgBW--day*)	**Effect HQ** (*dimensionless*)	**Tier-2 ADD** (*mg/kgBW--day*)	**TRV** (*mg/kgBW--day*)	**No-effect HQ** (*dimensionless*)	**TRV** (*mg/kgBW--day*)	**Effect HQ** (*dimensionless*)
Inorganics										
Antimony	2.55E-01	2.50E-01	1E+00	1.25E+00	2E-01	4.44E-01	2.50E-01	**2E+00**	1.25E+00	4E-01
Arsenic	3.80E+00	3.20E-01	**1E+01**	4.70E+00	8E-01	4.68E+00	3.20E-01	**1E+01**	4.70E+00	1E+00
Barium	7.50E+01	4.50E+01	**2E+00**	7.50E+01	1E+00	5.11E+01	4.50E+01	1E+00	7.50E+01	7E-01
Chromium (Total)	1.64E+00	1.47E+03	1E-03	7.34E+03	2E-04	1.94E+00	1.47E+03	1E-03	7.34E+03	3E-04
Copper	3.29E+01	2.67E+00	**1E+01**	6.32E+02	5E-02	2.67E+01	2.67E+00	**1E+01**	6.32E+02	4E-02
Lead	8.79E-01	1.00E+00	9E-01	2.41E+02	4E-03	2.59E+00	1.00E+00	**3E+00**	2.41E+02	1E-02
Manganese	1.59E+02	1.37E+01	**1E+01**	1.59E+02	1E+00	7.90E+01	1.37E+01	**6E+00**	1.59E+02	5E-01
Mercury	9.16E-02	2.70E-02	**3E+00**	2.70E-01	3E-01	8.30E-02	2.70E-02	**3E+00**	2.70E-01	3E-01
Thallium	6.62E-03	4.80E-01	1E-02	1.43E+00	5E-03	8.33E-02	4.80E-01	2E-01	1.43E+00	6E-02
Vanadium	1.44E+01	4.10E+00	**4E+00**	2.05E+01	7E-01	2.04E+01	4.10E+00	**5E+00**	2.05E+01	1E+00
Zinc	2.19E+01	9.61E+00	**2E+00**	4.11E+02	5E-02	5.28E+01	9.61E+00	**5E+00**	4.11E+02	1E-01
Polychlorinated Biphenyls (PCE										
PCB-1254	8.54E-03	3.60E-01	2E-02	1.28E+00	7E-03	3.27E-01	3.60E-01	9E-01	1.28E+00	3E-01
PCB-1260	6.87E-03	3.60E-01	2E-02	1.28E+00	5E-03	3.27E-01	3.60E-01	9E-01	1.28E+00	3E-01
Polychlorinated Dibenzo-p-diox										
2,3,7,8-TCDD TEQ (Mammal)	2.36E-07	1.00E-06	2E-01	1.00E-05	2E-02	9.93E-06	1.00E-06	**1E+01**	1.00E-05	1E+00

ERA.12

TIER-2 (SITE-SPECIFIC) HAZARD QUOTIENTS FOR MAMMALIAN RECEPTORS

Site 1A

MCB Camp Pendleton, California

Tier-2 Preliminary COPC	Southern Grasshopper Mouse					Gray Fox				
		Tier-1 (no-effect)		Tier-2 (effect)			Tier-1 (no-effect)		Tier-2 (effect)	
	Tier-2 ADD (*mg/kgBW--day*)	TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)	Tier-2 ADD (*mg/kgBW--day*)	TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)
Inorganics										
Antimony	2.70E-01	2.50E-01	1E+00	1.25E+00	2E-01	8.68E-05	2.50E-01	3E-04	1.25E+00	7E-05
Arsenic	2.51E+00	3.20E-01	**8E+00**	4.70E+00	5E-01	8.31E-03	3.20E-01	3E-02	4.70E+00	2E-03
Barium	1.72E+01	4.50E+01	4E-01	7.50E+01	2E-01	7.53E-02	4.50E+01	2E-03	7.50E+01	1E-03
Chromium (Total)	1.02E+00	1.47E+03	7E-04	7.34E+03	1E-04	8.78E-03	1.47E+03	6E-06	7.34E+03	1E-06
Copper	1.09E+01	2.67E+00	**4E+00**	6.32E+02	2E-02	7.07E-02	2.67E+00	3E-02	6.32E+02	1E-04
Lead	1.77E+00	1.00E+00	**2E+00**	2.41E+02	7E-03	3.43E-03	1.00E+00	3E-03	2.41E+02	1E-05
Manganese	1.32E+01	1.37E+01	1E+00	1.59E+02	8E-02	6.83E-02	1.37E+01	5E-03	1.59E+02	4E-04
Mercury	3.71E-02	2.70E-02	1E+00	2.70E-01	1E-01	4.87E-05	2.70E-02	2E-03	2.70E-01	2E-04
Thallium	6.34E-02	4.80E-01	1E-01	1.43E+00	4E-02	7.07E-05	4.80E-01	1E-04	1.43E+00	5E-05
Vanadium	1.16E+01	4.10E+00	**3E+00**	2.05E+01	6E-01	4.44E-02	4.10E+00	1E-02	2.05E+01	2E-03
Zinc	3.48E+01	9.61E+00	**4E+00**	4.11E+02	8E-02	5.16E-02	9.61E+00	5E-03	4.11E+02	1E-04
Polychlorinated Biphenyls (PCE										
PCB-1254	2.54E-01	3.60E-01	7E-01	1.28E+00	2E-01	1.72E-05	3.60E-01	5E-05	1.28E+00	1E-05
PCB-1260	2.55E-01	3.60E-01	7E-01	1.28E+00	2E-01	1.70E-05	3.60E-01	5E-05	1.28E+00	1E-05
Polychlorinated Dibenzo-p-diox										
2,3,7,8-TCDD TEQ (Mammal)	7.74E-06	1.00E-06	**8E+00**	1.00E-05	8E-01	5.17E-10	1.00E-06	5E-04	1.00E-05	5E-05

[a/] Tier-2 chemical of potential ecological concern.

Bold values indicate an HQ >1.

ERA.13
TIER-2 EXPOSURE ESTIMATES FOR AVIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Soil RG [b/] 0-1.5 ft bgs (*mg/kg soil dw*)	Food-item EPCs Plant (*mg/kg soil dw*)	Invertebrate (*mg/kg soil dw*)	Small-mammal Prey (*mg/kg soil dw*)	Tier-2 Average Daily Dose c/ (mg COPC / kgBW--day) California Quail	Horned Lark	Least Bell's Vireo	Red-tailed Hawk
Inorganics								
Antimony	5.8	1.16E+00	3.99E+00	2.65E-05	2.04E-02	4.28E-01	1.33E+00	1.90E-04
Arsenic	680	5.40E+00	2.41E+01	1.64E+00	2.88E-01	4.51E+00	1.23E+01	2.50E-02
Barium	2205.8	3.31E+02	2.01E+02	1.25E+02	5.31E+00	4.93E+01	8.14E+01	2.77E-01
Chromium (Total)	298	2.24E+00	9.31E+00	1.52E+01	1.23E-01	1.87E+00	4.98E+00	3.47E-02
Copper	5360	5.75E+01	5.15E+01	2.66E+01	2.37E+00	2.57E+01	5.23E+01	2.20E-01
Lead	72.8	2.94E+00	2.56E+01	7.19E+00	7.97E-02	2.50E+00	8.75E+00	1.42E-02
Manganese	2945	7.36E+02	1.03E+02	6.04E+01	1.10E+01	7.61E+01	5.76E+01	1.96E-01
Mercury	1.33	4.31E-01	5.22E-01	7.22E-02	6.67E-03	8.00E-02	1.80E-01	1.62E-04
Thallium	1.38	5.52E-03	9.49E-01	1.55E-01	1.16E-03	8.03E-02	3.15E-01	3.00E-04
Vanadium	2827	1.55E+01	1.19E+02	3.48E+01	1.11E+00	1.97E+01	5.70E+01	1.50E-01
Zinc	254	1.04E+02	5.26E+02	1.32E+02	1.88E+00	5.09E+01	1.72E+02	2.24E-01
Polychlorinated Biphenyls (P								
PCB-1254	1.48	1.31E-02	3.89E+00	1.01E-03	3.41E-03	3.15E-01	1.26E+00	5.02E-05
PCB-1260	1.4	6.36E-03	3.90E+00	3.19E-03	3.30E-03	3.15E-01	1.27E+00	5.12E-05

ERA.13
TIER-2 EXPOSURE ESTIMATES FOR AVIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Soil RG [b/] 0-1.5 ft bgs (*mg/kg soil dw*)	Food-item EPCs: Plant (*mg/kg soil dw*)	Invertebrate (*mg/kg soil dw*)	Small-mammal Prey (*mg/kg soil dw*)	Tier-2 Average Daily Dose c/ (mg COPC / kgBW--day): California Quail	Horned Lark	Least Bell's Vireo	Red-tailed Hawk
Polychlorinated Dibenzo-p-di								
2,3,7,8-TCDD TEQ (Bird)	0.00016	1.08E-06	4.30E-04	1.77E-07	3.71E-07	3.48E-05	1.40E-04	5.54E-09

[a/] Tier-2 preliminary chemical of potential ecological concern.

[b/] For the Tier-2 assessment, the soil exposure-point concentration (EPC) is the 95%UCL-M or the maximum detected concentration, whichever is less, in the indicated soil interval.

[c/] The Tier 2 average daily dose is estimated according to:

$$\text{Tier-2 ADD} = \{ \text{T2-IR}_F \times [(C_{plant(dw)} \times df_{plant}) + (C_{invertebrate(dw)} \times df_I) + (C_{small\ mammal(dw)} \times df_M) + (C_{soil} \times IR_S)] \times AUF \};$$

where:

T2-IR_F = Tier-2 food-ingestion rate (kg food dry weight / kg body weight -- day);

Cplant(ww) = plant EPC (mg COPC / kg plant dw);

df_P = dietary fraction of plant-matter (%);

Cinvertebrate(dw) = invertebrate EPC (mg COPC / kg invertebrate dw);

df_I = dietary fraction of invertebrates (%);

$C_{small\ mammal(dw)}$ = small-mammal prey EPC (mg COPC / kg small mammal dw);

df_M = dietary fraction of small mammals (%);

C_{soil} = soil EPC (mg COPC / kg soil dry weight, using the 0-1.5 ft bgs interval for all receptors);

IR_S = Incidental-ingestion rate for soil (%)

AUF = area use factor (maximum value = 1); ratio of site exposure area (3 acres) to average foraging range of the receptor:

California Quail: foraging area = 26 acre, AUF = 0.115;

Horned Lark: foraging area = 4 acre, AUF = 0.75;

Least Bell's Vireo: foraging area = 2 acre, AUF = 1;

Red-tailed Hawk: foraging area = 128 acre, AUF = 0.023;

ERA.14
DERIVATION OF EFFECT-BASED TOXICITY REFERENCE VALUES FOR BIRDS
Site 1A
MCB Camp Pendleton, California

	NOAEL-BASED TRVs										
Tier-2 Preliminary COPC a/	**Test Species**	**Test Effect Dose (*mg/kg $_{BW}$ day*) b/**	**Test Endpoint c/**	**Study Duration**	**Exposure Route**	**Effect**	**Source**	**Study Duration UF b/**	**Endpoint UF c/**	**Total UF d/**	**Effect-Based TRV (*mg/kg $_{BW}$--day*) e/**
Inorganics											
Antimony	Red-winged blackbird	100	LD50	Acute	Oral	Mortality (LD50 > 100 mg/kg) (antimony potassium tartrate as chemical surrogate)	Schafer et al., 1983	15	5	75	1.333333333
Arsenic	Mallard	22.01	LOAEL	4 weeks + hatching cycles	Diet	Reproductive effects	EFA West, 1998 (citing Stanley et al., 1994)	1	1	1	22.01
Barium	Chicken	416.53	LOAEL	4 weeks	Diet	Mortality	Sample et al., 1996 (citing Johnson et al., 1960)	5	1	5	83.306
Chromium (Total)	Black duck	5	LOAEL	10 months	Diet	Reproductive effects [based on Cr(III)]	Sample et al., 1996 (citing Haseltine et al., 1985)	1	1	1	5
Copper	Chicken	52.26	NOAEL	4 weeks	Diet	Gizzard erosion, feed:gain ratio, gizzard and proventriculus weight	EFA West, 1998 (citing Jensen and Maurice, 1978)	1	1	1	52.26
Lead	Chicken	8.75	EL	10 weeks dosed + 8 weeks observation	Diet	Egg production	EFA West, 1998 (citing Edens and Garlich, 1983)	1	1	1	8.75
Manganese	Japanese quail	776	EL	75-80 days	Diet	Behavior	EFA West, 1998 (citing Laskey and Edens, 1985)	1	1	1	776
Mercury	Mallard	0.18	LOAEL	1.5 years	Diet	Reproduction	EFA West, 1998 (citing Heinz and Locke, 1976)	1	1	1	0.18
Thallium	Pheasant	23.7	LD50	Acute	Diet	Mortality	Hudson et al., 1984	15	5	75	0.316
Vanadium	Mallard	11.4	NOAEL	12 weeks	Diet	Mortality, body weight, blood chemistry	Sample et al., 1996 (citing White and Dieter, 1978)	1	0.2	0.2	57
Zinc	Mallard	172	EL	60 days	Diet	Decreased body and organ weights, body:organ weight ratios, leg paralysis, diarrhea	EFA West, 1998 (citing Gasaway and Buss, 1972)	5	0.2	1	172
Polychlorinated Biphenyls (											
PCB-1254	Chicken	1.27	LOAEL	6 weeks dose + 6 weeks elimination	Diet	Reduced egg hatchability	EFA West, 1998 (citing Britton and Huston, 1973)	1	1	1	1.27

ERA.14
DERIVATION OF EFFECT-BASED TOXICITY REFERENCE VALUES FOR BIRDS
Site 1A
MCB Camp Pendleton, California

	NOAEL-BASED TRVs										
Tier-2 Preliminary COPC a/	**Test Species**	**Test Effect Dose (*mg/kg $_{BW}$ day*) b/**	**Test Endpoint c/**	**Study Duration**	**Exposure Route**	**Effect**	**Source**	**Study Duration UF b/**	**Endpoint UF c/**	**Total UF d/**	**Effect-Based TRV (*mg/kg $_{BW}$--day*) e/**
PCB-1260	Chicken	1.27	LOAEL	6 weeks dose + 6 weeks elimination	Diet	Reduced egg hatchability	EFA West, 1998 (citing Britton and Huston, 1973)	1	1	1	1.27
Polychlorinated Dibenzo-p-d											
2,3,7,8-TCDD TEQ (Bird)	Ring-necked pheasant	0.00014	LOAEL	10 weeks, including critical life stage	Injection (see Sample et al.,, 1996)	Reproduction	Sample et al., 1996 (citing Nosek et al., 1992)	1	1	1	0.00014

a/ Tier-2 preliminary chemical of potential ecological concern.
b/ Uncertainty factor (UF) to account for less-than-chronic durations.
c/ Uncertainty factor (UF) to account for test endpoints other than LOAELs.
d/ The prouduct of the duration and endpoint uncertainty factors.
e/ Effect-based toxicity reference values (TRVs) were calculated by dividing the test effect dose by the Total UF.

ERA.15
TIER-2 HAZARD QUOTIENTS FOR AVIAN RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC	California Quail					Horned Lark				
	Tier-2 ADD (*mg/kgBW--day*)	Tier-1 (no-effect) TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	Tier-2 (effect) TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)	Tier-2 ADD (*mg/kgBW--day*)	Tier-1 (no-effect) TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	Tier-2 (effect) TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)
Inorganics										
Antimony	2.04E-02	4.44E-01	5E-02	1.33E+00	2E-02	4.28E-01	4.44E-01	1E+00	1.33E+00	3E-01
Arsenic	2.88E-01	5.50E+00	5E-02	2.20E+01	1E-02	4.51E+00	5.50E+00	8E-01	2.20E+01	2E-01
Barium	5.31E+00	4.17E+01	1E-01	8.33E+01	6E-02	4.93E+01	4.17E+01	1E+00	8.33E+01	6E-01
Chromium (Total)	1.23E-01	1.00E+00	1E-01	5.00E+00	2E-02	1.87E+00	1.00E+00	**2E+00**	5.00E+00	4E-01
Copper	2.37E+00	2.30E+00	1E+00	5.23E+01	5E-02	2.57E+01	2.30E+00	**1E+01**	5.23E+01	5E-01
Lead	7.97E-02	1.40E-02	**6E+00**	8.75E+00	9E-03	2.50E+00	1.40E-02	**2E+02**	8.75E+00	3E-01
Manganese	1.10E+01	7.76E+01	1E-01	7.76E+02	1E-02	7.61E+01	7.76E+01	1E+00	7.76E+02	1E-01
Mercury	6.67E-03	3.90E-02	2E-01	1.80E-01	4E-02	8.00E-02	3.90E-02	**2E+00**	1.80E-01	4E-01
Thallium	1.16E-03	1.05E-01	1E-02	3.16E-01	4E-03	8.03E-02	1.05E-01	8E-01	3.16E-01	3E-01
Vanadium	1.11E+00	1.14E+01	1E-01	5.70E+01	2E-02	1.97E+01	1.14E+01	**2E+00**	5.70E+01	3E-01
Zinc	1.88E+00	1.72E+01	1E-01	1.72E+02	1E-02	5.09E+01	1.72E+01	**3E+00**	1.72E+02	3E-01
Polychlorinated Biphenyls (										
PCB-1254	3.41E-03	8.80E-02	4E-02	1.27E+00	3E-03	3.15E-01	8.80E-02	**4E+00**	1.27E+00	2E-01
PCB-1260	3.30E-03	8.80E-02	4E-02	1.27E+00	3E-03	3.15E-01	8.80E-02	**4E+00**	1.27E+00	2E-01
Polychlorinated Dibenzo-p-										
2,3,7,8-TCDD TEQ (Bird)	3.71E-07	1.40E-05	3E-02	1.40E-04	3E-03	3.48E-05	1.40E-05	**2E+00**	1.40E-04	2E-01

ERA.15

TIER-2 HAZARD QUOTIENTS FOR AVIAN RECEPTORS

Site 1A

MCB Camp Pendleton, California

Tier-2 Preliminary COPC	Least Bell's Vireo					Red-tailed Hawk				
	Tier-2 ADD (*mg/kgBW--day*)	Tier-1 (no-effect) TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	Tier-2 (effect) TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)	Tier-2 ADD (*mg/kgBW--day*)	Tier-1 (no-effect) TRV (*mg/kgBW--day*)	No-effect HQ (*dimensionless*)	Tier-2 (effect) TRV (*mg/kgBW--day*)	Effect HQ (*dimensionless*)
Inorganics										
Antimony	1.33E+00	4.44E-01	**3E+00**	1.33E+00	1E+00	1.90E-04	4.44E-01	4E-04	1.33E+00	1E-04
Arsenic	1.23E+01	5.50E+00	**2E+00**	2.20E+01	6E-01	2.50E-02	5.50E+00	5E-03	2.20E+01	1E-03
Barium	8.14E+01	4.17E+01	**2E+00**	8.33E+01	1E+00	2.77E-01	4.17E+01	7E-03	8.33E+01	3E-03
Chromium (Total)	4.98E+00	1.00E+00	**5E+00**	5.00E+00	1E+00	3.47E-02	1.00E+00	3E-02	5.00E+00	7E-03
Copper	5.23E+01	2.30E+00	**2E+01**	5.23E+01	1E+00	2.20E-01	2.30E+00	1E-01	5.23E+01	4E-03
Lead	8.75E+00	1.40E-02	**6E+02**	8.75E+00	1E+00	1.42E-02	1.40E-02	1E+00	8.75E+00	2E-03
Manganese	5.76E+01	7.76E+01	7E-01	7.76E+02	7E-02	1.96E-01	7.76E+01	3E-03	7.76E+02	3E-04
Mercury	1.80E-01	3.90E-02	**5E+00**	1.80E-01	1E+00	1.62E-04	3.90E-02	4E-03	1.80E-01	9E-04
Thallium	3.15E-01	1.05E-01	**3E+00**	3.16E-01	1E+00	3.00E-04	1.05E-01	3E-03	3.16E-01	9E-04
Vanadium	5.70E+01	1.14E+01	**5E+00**	5.70E+01	1E+00	1.50E-01	1.14E+01	1E-02	5.70E+01	3E-03
Zinc	1.72E+02	1.72E+01	**1E+01**	1.72E+02	1E+00	2.24E-01	1.72E+01	1E-02	1.72E+02	1E-03
Polychlorinated Biphenyls (										
PCB-1254	1.26E+00	8.80E-02	**1E+01**	1.27E+00	1E+00	5.02E-05	8.80E-02	6E-04	1.27E+00	4E-05
PCB-1260	1.27E+00	8.80E-02	**1E+01**	1.27E+00	1E+00	5.12E-05	8.80E-02	6E-04	1.27E+00	4E-05
Polychlorinated Dibenzo-p-										
2,3,7,8-TCDD TEQ (Bird)	1.40E-04	1.40E-05	**1E+01**	1.40E-04	1E+00	5.54E-09	1.40E-05	4E-04	1.40E-04	4E-05

[a/] Tier-2 chemical of potential ecological concern.

Bold values indicate an HQ >1.

ERA.16
SUMMARY OF TIER-2 EFFECT-BASED HAZARD QUOTIENTS FOR ECOLOGICAL RECEPTORS
Site 1A
MCB Camp Pendleton, California

Tier-2 Preliminary COPC [a/]	Concentration Resulting in an HQ=1 for the Most Sensitive Receptor (mg/kg)	Background Concentration [b/] (*mg/kg*)	Effect-based HQs for Mammals				Effect-based HQs for Birds			
			Pacific Pocket Mouse	Deer Mouse	Southern Grasshopper Mouse	Gray Fox	California Quail	Horned Lark	Least Bell's Vireo	Red-tailed Hawk
Inorganics										
Antimony	5.8	8.8	2.0E-01	3.6E-01	2.2E-01	6.9E-05	1.5E-02	3.2E-01	**1.0E+00**	1.4E-04
Arsenic	680	4.6	8.1E-01	**1.0E+00**	5.3E-01	1.8E-03	1.3E-02	2.0E-01	5.6E-01	1.1E-03
Barium	2205.8	262	**1.0E+00**	6.8E-01	2.3E-01	1.0E-03	6.4E-02	5.9E-01	9.8E-01	3.3E-03
Chromium (Total)	298	33	2.2E-04	2.6E-04	1.4E-04	1.2E-06	2.5E-02	3.7E-01	**1.0E+00**	6.9E-03
Copper	5360	26.8	5.2E-02	4.2E-02	1.7E-02	1.1E-04	4.5E-02	4.9E-01	**1.0E+00**	4.2E-03
Lead	72.8	29.1	3.7E-03	1.1E-02	7.4E-03	1.4E-05	9.1E-03	2.9E-01	**1.0E+00**	1.6E-03
Manganese	2945	688	**1.0E+00**	5.0E-01	8.3E-02	4.3E-04	1.4E-02	9.8E-02	7.4E-02	2.5E-04
Mercury	1.33	0.08	3.4E-01	3.1E-01	1.4E-01	1.8E-04	3.7E-02	4.4E-01	**1.0E+00**	9.0E-04
Thallium	1.38	1.4	4.6E-03	5.8E-02	4.4E-02	4.9E-05	3.7E-03	2.5E-01	**1.0E+00**	9.5E-04
Vanadium	2827	69.4	7.0E-01	1.0E+00	5.7E-01	2.2E-03	2.0E-02	3.5E-01	**1.0E+00**	2.6E-03
Zinc	254	111	5.3E-02	1.3E-01	8.5E-02	1.3E-04	1.1E-02	3.0E-01	**1.0E+00**	1.3E-03
Polychlorinated Biphenyls (PCBs)										
PCB-1254	1.48	Not Applicable	6.7E-03	2.6E-01	2.0E-01	1.3E-05	2.7E-03	2.5E-01	**1.0E+00**	4.0E-05
PCB-1260	1.4	Not Applicable	5.4E-03	2.6E-01	2.0E-01	1.3E-05	2.6E-03	2.5E-01	**1.0E+00**	4.0E-05
Polychlorinated Dibenzo-p-dioxins and										
2,3,7,8-TCDD TEQ (Bird)	0.00016	Not Applicable	--	--	--	--	2.7E-03	2.5E-01	1.0E+00	4.0E-05
2,3,7,8-TCDD TEQ (Mammal)	0.000044	Not Applicable	2.4E-02	**9.9E-01**	7.7E-01	5.2E-05	--	--	--	--

APPENDIX C

Agency Correspondence

Responses to Comments,
Draft Explanation of Significant Difference for Operable Unit 3 Record of Decision
IR Site 1A,
Marine Corps Base Camp Pendleton, California
Dated October 12, 2007 (DCN: RBAE-4080-0017-0011)
DCN: RBAE-4080-0017-0018

Tayseer Mahmoud, DTSC Remedial Project Manager and DTSC Legal Counsel (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
<u>The significant differences between the remedy presented in the OU 3 ROD and the actions proposed for the site include:</u> 1) The original remedy of approximately 31,700 cubic yards of contaminated soil will be increased to 114,800 cubic yards which includes an estimated 21,800 cubic yards of remaining contaminated material planned for removal as part of this ESD. 2) The disposal location for remaining contaminated material will be as off-base facility instead of the on-base Box Canyon Landfill disposal documented in the OU 3 ROD. 3) Revised Remediation Goals (RGs) for the remaining materials will be based on the most recent developed remediation goals for Operable Unit 5. 4) The cost for implementation of the remedy was $1.3 million and will be increased to $5.7 million. 5) Discovery of potential groundwater contamination at Site 1A and potential necessity for further monitoring and or remediation of groundwater.	
<u>Specific Comments</u> 1) The proposed changes to the remedy, items 1 through 4 above qualify for ESD; however, item 5 concerning contaminated groundwater may not qualify for the requested ESD if groundwater contamination remains at the site after the planned removal of the contaminated material. A groundwater remedy and land use controls to protect monitoring wells would require a ROD amendment.	1) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action.

Tayseer Mahmoud, DTSC Remedial Project Manager and DTSC Legal Counsel (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
2) Section 3.2.6 Trench Sampling Field Results: This section documents burn ash and drums discovered in Test Pit 17 and soil samples were analyzed for lead only. Please clarify why soil sampling did not include all chemicals of concern for unknown content of the drums. Also, please provide clarification why samples were not analyzed for dioxin, dibenzofuran (furan), PCBs, or other contaminants typically associated with burn-dump sites.	2) The trench sampling investigation was a "good faith" gesture performed by the Navy to help further characterize the distribution of burn ash waste based primarily on field observations. Limited sampling was performed to confirm what was observed in the field in accordance with the approved *Final Technical Memorandum for Trench Sampling Activities* (General Dynamics, 2007). In addition, lead has historically proven to be a good indicator parameter for burn ash waste. Since additional remedial excavation activities were already planned, further characterization of the potential drum contents were not performed.
3) Please provide an explanation how the estimated volume of remaining contaminated materials at the site is accurate considering that soil sampling was limited to lead.	3) The lateral distribution was based on excavation perimeter and floor confirmation sample results and observations from the initial remedial excavation in 1999 and augmented by the results of the 2006 trench sampling. Confirmation sample analytical results for COCs were compared with revised RGs to identify exceedances. The vertical extent estimate was based primarily on visual field evidence observed during trench sampling activities performed in 2006. The volume estimate was calculated by multiplying the approximate area of COC exceedances by the average thickness of burn ash observed (4 ft). The DoN acknowledges that there was an unacceptable amount of uncertainty in estimating volume with the confirmation data alone, and appreciates agency support for proceeding with the trench sampling to optimize remedial actions at the site. Although there is still some uncertainty in the current volume estimate, the DoN prefers to direct the limited funding

Tayseer Mahmoud, DTSC Remedial Project Manager and DTSC Legal Counsel (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	available toward remedial action at this time, rather than continue characterization activities to further refine the estimated volume.
4) Section 3.3 Revised Remediation Goals: The revised Remediation Goals in Table 3 is limited to metals only and should include dioxin and furan and any other chemicals of concern based on confirmation sampling results for unknown contents of drums discovered in Test Pit 17.	4) Since Site 1A is a burn ash site, and dioxins/furans are commonly associated with waste incineration, an RG for dioxins/furans as a 2,3,7,8-tetrachlorodibenzo-p-dioxin toxicity equivalent (2,3,7,8-TCDD TEQ) has been developed and added to Table 3. Its derivation is included in the attached Tables that depict calculation of ecological RGs. In accordance with the approved Work Plan, the sample collected of the solid mottled white and gray colored ash observed in Test Pit 17, near the drum fragments, was analyzed for lead only. Since additional remedial excavation activities were already planned, further characterization of the potential drum contents were not performed. The removal action sampling and analysis plan dictates the planned analytical protocol.
5) Confirmation Soil Sampling: Please include a section on confirmation sampling that will be conducted at the site to ensure the effectiveness of the removal action.	5) Confirmation soil sampling will be conducted in accordance with the protocol specified in the Site Management Plan (SMP) addendum. This ESD only documents specific changes to the ROD.
6) Restoration and Replacement with Clean Backfill: Please include a section on fill material sampling and chemical constituents that will be analyzed to ensure that the fill material is uncontaminated and appropriate for use as backfill.	6) Soil sampling will be conducted in accordance with the protocol specified in the SMP addendum. Additional details regarding the protocol that will be followed to assure that the excavation is backfilled with clean fill will be included in the Remedial

Tayseer Mahmoud, DTSC Remedial Project Manager and DTSC Legal Counsel (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	Excavation Work Plan and Sampling and Analysis Plan. Site backfill and restoration activities will be conducted by the same remediation contractor and will follow similar protocol as other burn ash sites.

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
The rationale for the revised remediation goals for the inorganic chemicals presented in Table 3 of the "Explanation of Significant Difference for OU3" remains ambiguous as illustrated below:	**General Response** As agreed upon by the FFA Team, the revised RGs for IR Site 1A were derived using the same rationale that were used to calculate the RGs for IR Site 1A-1 in the OU5 FS. Using the identical exposure algorithms and the toxicity reference values (TRVs) used in the OU5 Tier-2 baseline ecological risk assessments, risk-estimation equations can be back-calculated to derive soil concentrations that resulted in a Tier-2 hazard quotient (HQ) value equal to the indicator threshold of 1.0. This process is simply the reverse of the "forward calculations" presented in the OU5 ERAs, in which a soil concentration enters the equations and the risk estimate is the outcome. The value selected as a site- and chemical-specific ecological RG is the concentration that results in an HQ≤1 for all wildlife receptors, derived using an effect-based TRV. Since several COCs for IR Site 1A were not identified as COPCs for IR Site 1A-1 in the ERA Teir-2 evaluation, corresponding RGs

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	were not included in the OU5 FS. Appendix E of the OU5 FS gives a general discussion on how RGs for IR Site 1A-1 COCs were derived. Using the same assumptions and parameters, RGs for IR Site 1A COCs were calculated independently by Parsons. Tables depicting the calculations used to derive the RGs for IR Site 1A, as well as Appendix E of the OU5 FS, are attached for your reference. The attached tables depict forward hazard calculations with the selected RGs as the inputs. As shown in Table ERA.16, the selected RGs results in HQs=1 for the most sensitive evaluated receptor. In most cases, the lower value between the OU5 HHRA and ERA PRGs was selected as the revised RG. In instances where this value was less than the San Luis Rey Basin background concentration value, the background concentration was selected as the revised RG. Responses to subsequent specific comments are provided below for further clarification.
1) Antimony – the background concentration (8.8 mg/kg) is higher than the ecological RG (5.8 mg/kg), therefore, the background concentration was the revised RG. HERD notes that although the footnote in Table 3 cites Appendix E as the source of the ecological preliminary remediation goal (PRG) for antimony, the value derived in Appendix E is 12 mg/kg. This inconsistency should be corrected and the appropriate source of the revised RG should be cited.	1) The referenced PRG of 12 mg/kg in Appendix E was calculated for IR Site 1111, not 1A-1. The ecological RG of 5.8 mg/kg for antimony was derived from the effect-based toxicity reference value (TRV) for avian receptors (Table ERA.14 in the attached tables) and exposure parameters for the Least Bell's Vireo (Table ERA.13). The RG of 5.8 mg/kg corresponds to the concentration that results in an HQ≤1 for all the receptors evaluated (Table ERA.16) (i.e., the concentration resulting in an HQ=1 for the most sensitive receptor).

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
2) Arsenic – the ecological RG of 680 mg/kg was higher than the background concentration of 17 mg/kg but was selected as the revised RG. This is inconsistent with the rationale used in the selection of the revised RG for antimony. The Navy should resolve the inconsistency. Furthermore, Appendix E does not discuss how the ecological RG was derived.	2) In most cases, the lower value between the OU5 HHRA and ERA PRGs was selected as the revised RG. In instances where this value was less than the San Luis Rey Basin background concentration value (as in the case of antimony), the background concentration was selected as the revised RG. As discussed in the general response above, ecological RGs were derived using the same assumptions and parameters that were applied to derived ecological RGs at nearby Site 1A-1. The ecological RG for arsenic is based on the effects-based TRV for mammalian receptors (Table ERA. 10) and exposure parameters for the Deer Mouse (Table ERA.11) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
3) Barium – the ecological PRG of 2,206 mg/kg was selected as the revised RG because it was higher than the background concentration of 133 mg/kg but lower than the human health RG of 5,417 mg/kg. Contrary to the footnote in Table 3, Appendix E does not discuss the derivation of the ecological RG of barium. The	3) As discussed in the general response above, Appendix E of the OU5 FS gives a general discussion on how RGs for IR Site 1A-1 COPC were derived. Using the same assumptions and parameters, RGs for IR Site 1A COCs were calculated separately, as agreed upon by the FFA Team. The tables containing the calculations for

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
Navy should explain how the revised RG of 2,206 mg/kg was derived.	the RGs for IR Site 1A, including calculation inputs, as well as Appendix E from the OU5 FS, are attached for your reference. The ecological RG for barium is based on the effects-based TRV for mammalian receptors (Table ERA.11) and exposure parameters for the Pacific Pocket Mouse (Table ERA.10) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
4) Chromium (Total) – the ecological PRG of 298 mg/kg is higher than the background of 16 mg/kg but lower than the human health RG of 1,429 mg/kg. The ecological PRG was selected as the revised RG but Appendix E does not explain how the revised RG for chromium was derived. Moreover, since the human health PRG for total chromium is 210 mg/kg (EPA, 2004), HERD recommends that the revised RG should be 210 mg/kg.	4) The human health RG was estimated based on site-specific conditions and exposure scenarios. Although the USEPA Region 9 (2004) PRG is less than the site-specific human health RG, it is not based on site-specific conditions. To remain consistent with the rationale agreed upon by the FFA Team, the ecological PRG (298 mg/kg) should be retained. The ecological RG for chromium (total) is based on the effects-based TRV for avian receptors (Table ERA.14) and exposure parameters for the Least Bell's Vireo (Table ERA.13) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
5) Copper – the revised RG of 3,129 mg/kg is the lower value between human health and the ecological PRG. Once again, Table 3 cites Appendix E as the source of the ecological PRG, but Appendix E submitted by the Navy does not contain this information.	5) See the general response section above for a general description of the methods used to derive ecological RGs for Site 1A. The ecological RG for copper is based on the effects-based TRV for avian receptors (Table ERA.14) and exposure parameters for the Least Bell's Vireo (Table ERA.13) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the footnote in Table 3 has been revised to refer to the attached tables as the source for the ecological RGs.
6) Lead – the revised RG for lead is the ecological PRG of 73 mg/kg compared to the background concentration of 12 mg/kg. In this instance, Appendix E discusses the source of the ecological RG, hence, no additional information is being requested by HERD. However, HERD recommends that the human health PRGs of 400 mg/kg (EPA, 2004) and 150 mg/kg (CalEPA-modified) be presented in Table 3.	6) Table 3 has been revised to present the USEPA Region 9 (2004) PRG of 400 mg/kg and the CalEPA-modified PRG of 150 mg/kg in the human health RG column for lead.
7) Manganese – the human health soil PRG of 1,812 mg/kg is higher than the background concentration but lower than the ecological PRG of 2,945 mg/kg. Appendix E does not discuss the derivation of this revised ecological RG.	7) See the general response section above for a description of the methods used to derive ecological RGs for Site 1A. The RG for manganese is based on the effects-based TRV for

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	mammalian receptors (Table ERA.11) and exposure parameters for the Pacific Pocket Mouse (Table ERA.10) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
8) Mercury – Appendix E discusses the derivation of the ecological PRG of 8.5 mg/kg. However, the revised PRG shown on Table 3 is 1.33 mg/kg.	8) The referenced PRG of 8.5 mg/kg in Appendix E was calculated for IR Site 1111, not 1A-1. As discussed above, the RGs for IR Site 1A COCs were calculated separately using the same assumptions and parameters that were used for IR Site 1A-1 in the OU5 FS (Appendix E), as agreed upon by the FFA Team. The tables containing the calculations for RGs for IR Site 1A, including calculation inputs, as well as Appendix E from the OU5 FS, are attached for your reference. The ecological RG for mercury is based on the effects-based TRV for avian receptors (Table ERA. 14) and exposure parameters for the Least Bell's Vireo (Table ERA.13) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
9) Thallium – the background concentration of 1.4 mg/kg was selected as the revised RG. No additional information is required but HERD recommends that the human health PRG be changed to 5.2 mg/kg (EPA, 2004) instead of 6.3 mg/kg. Appendix E does not discuss the development of the ecological PRG.	9) To stay consistent with the rationale agreed upon by the FFA Team, the human health PRG (6.3 mg/kg) should be retained. The ecological RG for thallium is based on the effects-based TRV for avian receptors (Table ERA. 14) and exposure parameters for the Least Bell's Vireo (Table ERA.13) because this was the most sensitive among the receptors evaluated (Table ERA.16). To clarify, the attached tables have been added as an Appendix to the ESD and the footnote in Table 3 has been revised to refer to this appendix as the source for the ecological RGs.
10) Zinc – the revised RG of 254 mg/kg is an ecological PRG and its derivation was discussed in Appendix E. No additional information is required.	10) This comment is noted.
11) In general, the revised RGs seem to be the lower value between the human health and the ecological RGs. However, Appendix E, which was provided as supporting documentation for the derived ecological RGs does not discuss the derivation for arsenic, barium, total chromium, copper, manganese, and thallium. The ecological PRGs for antimony and mercury, as discussed in Appendix E, are inconsistent with the values presented in Table 3. HERD recommends that these deficiencies be addressed prior to approval of the ESD for OU3.	11) As discussed above, the RGs for IR Site 1A COCs were calculated separately using the same assumptions and parameters that were used for IR Site 1A-1 in the OU5 FS (Appendix E), as agreed upon by the FFA Team. Tables containing the calculations for RGs for IR Site 1A, as well as Appendix E from the OU5 FS, are attached for your reference. In most cases, the lower value between the OU5 HHRA and ERA PRGs was selected as the revised RG. In instances where this value was less than the San Luis Rey Basin background concentration

Riz Sarmiento, DTSC Staff Toxicologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
Since the Site is a burn ash site, the confirmation samples should include these analytes in the analysis. The RGs should also include dioxins/furans and polychlorinated biphenyls for evaluating the residential risks potentially posed to human and ecological receptors. HERD recommends that these technical issues and deficiencies be addressed. Recommendations made in the document are site-specific and should not be construed as a policy decision applicable to other sites.	value, the background concentration was selected as the revised RG. Since Site 1A is a burn ash site , and dioxins/furans are commonly associated with waste incineration, an RG for dioxins/furans as a 2,3,7,8-tetrachlorodibenzo-p-dioxin toxicity equivalent (2,3,7,8-TCDD TEQ) has been developed and added to Table 3. Its derivation is included in the attached Tables that depict calculation of ecological RGs. The ecological RG for 2,3,7,8-TCDD TEQ is based on the effects-based TRV for mammalian receptors (Table ERA.11) and exposure parameters for the Deer Mouse (Table ERA.10) because this was the most sensitive among the receptors evaluated (Table ERA.16). There is no site history to indicate that polychlorinated biphenyls (PCBs) may be present in soils at the site. In addition, a total of 18 soil samples were collected from 6 borings during the Remedial Investigation in 1996. PCBs were not reported above the residential PRGs in all 18 samples analyzed. Further evaluation of PCBs is considered unnecessary.

Responses to Comments,
Draft Explanation of Significant Difference for Operable Unit 3 Record of Decision
IR Site 1A,
Marine Corps Base Camp Pendleton, California
Dated October 12, 2007 (DCN: RBAE-4080-0017-0011)
DCN: RBAE-4080-0017-0018

Brian McDaniel, RWQCB Engineering Geologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
General Comments 1) The discussion provided throughout the document regarding the amounts of waste proposed to be excavated and remaining with respect to revised remediation goals is confusing. It is unclear as to the current amount of contaminated material remaining in place. A description of the amounts with respect to project status/timeframes should be reiterated in a table format in order to provide clarity in the document.	1) Following suspension of remedial excavation activities in 1999, it was estimated that a six-foot layer of burn ash, making up approximately 50,000 yds^3, remained at the site. As discussed in Section 3.4, the estimated volume of remaining burn ash waste was recalculated to be approximately 21,800 yds^3. As requested by the U.S. EPA, the volume will be revised to 22,000 yds^3 throughout the document to provide a more conservative estimate.
2) A table indicating contaminates of concern (COCs) and remediation goals (RGs) for the site should be provided.	2) Table 3 lists all of the COCs for Site 1A as well as revised RGs.
3) The ESD indicates that additional ground-water monitoring may be required should remediation goals not be attained. Details regarding the additional monitoring program should be provided or referenced including additional well placement and monitoring frequency.	3) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action.
4) The ESD should provide a discussion regarding Base production wells within the basin, outside Base boundaries, and within a 1 mile radius of the site. Additional relevant information should be referenced.	4) The text will be revised to include the following: "The nearest groundwater production wells to IR Site 1A are over four miles downgradient from the site in the San Luis Rey River Basin. Two production wells (Well 4 and 5) in the San Luis Rey River Valley are located near the intersection of North River Road and College

Brian McDaniel, RWQCB Engineering Geologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	Boulevard in the City of Oceanside." This ESD references existing documents, such as the OU3 ROD, Remedial Investigation Report for Group D Sites, and Remediation Design and Remedial Action Work Plan for OU3, that contain the information requested. Since the ESD only addresses specific changes to the ROD, a discussion at the level of detail requested will not be included.
Specific Comments 1) Section 1.3, Summary of Need for ESD, Page 1, Paragraph 2 The ESD indicates that further investigation is warranted to identify the source of TCE reported in groundwater. It is unclear if this will require additional sampling, additional wells, geophysical work or other investigation means. Further discussion should be provided on the proposed investigation and timeframes.	1) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action.
2) Section 1.3, Summary of Need for ESD, Page 1, Paragraph 2 The ESD indicates that if revised RGs and/or acceptance risk values are attained, no further action with unrestricted land use is an appropriate alternative for IR Site 1A. The ESD should provide a discussion regarding alternatives should RGs not be attained.	2) The following bullets will be added after the 4th bullet in Section 1.3: • Acknowledge that if revised RGs are not attained and localized exceedances are identified following removal of the recalculated volume of remaining burn ash waste, then the remedial action will be continued until revised RGs are attained to the extent practicable.

Brian McDaniel, RWQCB Engineering Geologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
	• Acknowledge that if revised RGs are not attainable or practicable, then site risk will be recalculated and a risk management decision will be made for the site.
3) <u>Section 3.0 Basis for ESD, Page 6, Paragraph 1</u> As stated in the ESD, following remedial activities, it is estimated that approximately 50,000 yds^3 will remain at the site. It also indicates that a portion of the remaining waste appears to be beneath the ground-water table. Provide as estimate of the waste remaining beneath the ground-water table.	3) Following suspension of remedial excavation activities in 1999, it was estimated that a six-foot layer of burn ash, making up approximately 50,000 yds^3, remained at the site. As discussed in Section 3.4, the estimated volume of remaining burn ash waste was recalculated to be approximately 21,800 yds^3. As requested by the U.S. EPA, the volume will be revised to 22,000 yds^3 throughout the document to provide a more conservative estimate. Because of the drastic fluctuation in groundwater elevations at the site it is difficult to calculate the volume of waste remaining beneath the groundwater table. During a limited portion of several previous years, the groundwater table is above ground surface in the interior of the site, so the entire estimated volume of remaining burn ash material (approximately 22,000 yds^3) has been below the water table. That is not the case currently.
4) <u>Section 3.1 Groundwater Monitoring Program, Page 8, Paragraph 1</u> The ESD indicates that additional ground-water monitoring may be performed to determine if TCE reported in ground-water poses an unacceptable risk to human health and/or the environment following additional excavation activities. Details should be provided	4) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the

Brian McDaniel, RWQCB Engineering Geologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
regarding any additional ground-water monitoring that may be performed.	DoN will assess site conditions and determine an appropriate course of action.
5) <u>Section 3.3 Revised Remediation Goals, Page 10, Paragraph 3</u> IR Site 1A-1 is located 800 feet northwest of IR Site 1A. Site 1A-1 should also be identified on Figure 1 or an additional figure.	5) IR Site 1A-1, as well as IR Sites 1I and 2A are now included on Figure 1.
6) <u>Section 3.4 Remaining Burn Ash Waste, Page 11, Paragraph 1</u> The volume of remaining burn ash waste below the site was recalculated to be approximately 21,800 yds^3, assuming a uniform average thickness of 4 feet. Provide the basis of this determination.	6) The lateral distribution was based primarily on excavation perimeter and floor confirmation sample results and observations from the initial remedial excavation in 1999 and augmented by the results of the 2006 trench sampling. Confirmation sample analytical results were compared with revised RGs to identify exceedances. The vertical extent was estimated primarily based on visual field evidence observed during trench sampling activities performed in 2006. The volume estimate was calculated by multiplying the approximate area of COC exceedances by the average thickness of burn ash observed.
7) <u>Section 4.0 Description of Significant Differences, Page 11, Paragraph 2</u> The ESD indicates that the potential source of TCE contamination will be evaluated during the course of excavating the remaining burn ash. Provide details/methods regarding the evaluation process including methods and timeframes.	7) Please refer to the site-specific SMP addendum for a discussion of the field evaluation methods that will be used to identify if organic vapors are present during remedial excavation activities.

Brian McDaniel, RWQCB Engineering Geologist (Received December 11, 2007)	**NAVFAC SW Response (February 5, 2008)**
8) Section 4.0 Description of Significant Differences, Page 11, Paragraph 2 The ESD indicates that following removal of the remaining burn ash, ground-water monitoring may be implemented in the vicinity of previous TCE detections to determine if TCE remains in ground-water at levels that pose an unacceptable risk to human health and/or the environment. Provide details regarding the ground-water monitoring program.	8) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary, which may incur a ROD amendment rather than an ESD. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action.
9) Table, Page 12 The table indicates that an additional 21,800 yds^3 of remaining contaminant materials is planned for disposal. Section 2.5, Remedial Action, Paragraph 2, indicates that a portion of the remaining waste (estimated at 50,000 yds^3) appeared to be in contact with ground-water based on visual observations during excavation activities. Please clarify the tables.	9) Following suspension of remedial excavation activities in 1999, it was estimated that a six-foot layer of burn ash, making up approximately 50,000 yds^3, remained at the site. The volume was refined and recalculated to be approximately 21,800 yds^3 based on a comparison of historical data to revised RGs, and the vertical extent encountered during trench sampling activities in 2006. The table on page 12 is correct. As requested by the U.S. EPA, the volume will be revised to 22,000 yds^3 throughout the document to provide a more conservative estimate.

Responses to Comments,
Draft Explanation of Significant Difference for Operable Unit 3 Record of Decision
IR Site 1A,
Marine Corps Base Camp Pendleton, California
Dated October 12, 2007 (DCN: RBAE-4080-0017-0011)
DCN: RBAE-4080-0017-0018

Martin Hausladen, U.S. EPA Remedial Project Manager (Received November 30, 2007)	**NAVFAC SW Response (February 5, 2008)**
1) Global - Change 21,800 cu yds to about 22,000 cu yds.	1) References to the total volume will be changed globally to 22,000 cu yds throughout the ESD.
2) Pg 1, Sec 1.3, 1st bullet - s/b "historical" not "historic"; TCE was "detected" in piezometer wells, not "reported"; 3rd bullet - Need better documentation of where the RGs came from and why.	2) "Historic" will be changed to "historical" and "reported" will be changed to "detected". The 3rd bullet will be revised to state the following: "Document the revised remediation goals (RGs), based on recently developed values from an adjacent site (IR Site 1A-1) historically associated with IR Site 1A, that must be attained to warrant unrestricted land use;"
3) Pg 2, bullet - if this remains an and/or it should be expanded...if we obtain RGs, great, however, if we don't we need to conduct a risk evaluation blah blah Next paragraph - change CG "proposed" closure to CG "directed" closure and add reason why	3) The following bullets will be added after the 4th bullet: • Acknowledge that if revised RGs are not attained and localized exceedances are identified following removal of the recalculated volume of remaining burn ash waste, then the remedial action will be continued until revised RGs are attained to the extent practicable. • Acknowledge that is revised RGs are not attainable or practicable, then site risk will be recalculated and a risk management decision will be made for the site. This section will be revised to state that the CG directed closure of the CAMU as part of the Box Canyon Landfill closure activities, thus requiring a new disposal site or remedial alternative for the remaining impacted soil at IR Site 1A.

Martin Hausladen, U.S. EPA Remedial Project Manager (Received November 30, 2007)	**NAVFAC SW Response (February 5, 2008)**
4) Pg 4, 1st full paragraph - this section is confusing. Can you put elevations in. As it's written it goes back and forth. For example, the elevation changed 9 feet from what?	4) This paragraph will be revised as follows: "Comparison of groundwater elevation data between the sampling event in October 2002 until the final sampling event in 2003 indicates that, in general, water levels have shown an increasing trend across the site. During that time, water levels displayed a maximum elevation change between approximately 7.0 and 11.5 feet. The greatest groundwater elevation change was an 11.56 foot increase, observed in monitoring Well 1A-01."
5) Pg 6, Sec 3.0 - Add CG "directed" and it "had been" determined at the May meeting, not "was"	5) "Proposed" will be changed to "directed" and "was" will be changed to "has been".
6) Pg 7, 3rd paragraph, last sentence - change to be more clear that the high levels of manganese in soil are believed to be naturally occurring and this contributes to the high levels in groundwater. Switch the order.	6) This sentence will be changed as follows: "The high levels of manganese in soil are believed to be naturally occurring, which contributes to the elevated levels historically reported in groundwater at MCB Camp Pendleton."
7) Pg 6, 1st paragraph - what are low levels? Below MCLs? How do we know TCE is not migrating offsite? Is it more accurate to say we had only a few hits that were never replicated or seen in downgradient wells? At one point the Navy said the TCE was from cross-contamination.	7) TCE was reported above the MCL (5 ug/L) in one piezometer (GMW-6) within the interior of the site during two consecutive events in 2003 at 17.0 and 8.4 ug/L, respectively, but was reported below the MCL (3.0 ug/L) during the last event in June 2003. TCE was also reported above the MCL in one upgradient (1A-01) and one downgradient well (1A-03) during the initial monitoring event in 2000, but this was attributed to cross-contamination from sampling equipment used at another site. TCE has not been reported above the laboratory method reporting limit in all

Martin Hausladen, U.S. EPA Remedial Project Manager (Received November 30, 2007)	**NAVFAC SW Response (February 5, 2008)**
	upgradient and downgradient wells sampled in the subsequent seven events (including 1A-01 and 1A-03).
8) Pg 9, Sec 3.2.3 - State that the reason we only sampled for lead was because it has been proven on other burn ash sites to be an indicator chemical.	8) The sentence will be changed as followed: "All soil samples were analyzed for lead using US EPA Method 6020, since it has historically proven to be a good indicator parameter for burn ash waste."
9) Sec 3.2.6 - Clarify what you think the dark-colored, organic layer was (coal tar, sewage sludge, etc.) Also visually observed is redundant, if it was observed, it was observed visually. Once you excavate soil it becomes a waste. Add caveat that we put it back because we were only trying to quantify volume and we knew we would be conducting the RA within a few months.	9) The dark colored organic layer was believed to be decomposed vegetation or humus. The word "visually" will be removed. The text will be revised to include that the waste was put back in each test pit of origin since the RA was planned.
10) Pg 10, 1st paragraph, halfway through - "Remedial Action Standards" s/b "Remedial Goals" 2nd paragraph - Delete "all" before remaining burn ash; change "warrant" unrestricted use to "allow" Again for RGs, provide rationale for concurrence, not date	10) "Remedial Action Standards" will be changed to "Remedial Goals", "all" before "remaining burn ash" will be deleted, and "warrant' will be changed to "allow". The following paragraph regarding the rationale for the revised RGs will be included: "As agreed upon by the FFA Team, the revised RGs for IR Site 1A were derived using the same rationale that were used to calculate the RGs for IR Site 1A-1 in the OU5 FS. Using the identical exposure algorithms and the toxicity reference values (TRVs) used in the OU5 Tier-2 baseline ecological risk assessments, risk-

Martin Hausladen, U.S. EPA Remedial Project Manager (Received November 30, 2007)	**NAVFAC SW Response (February 5, 2008)**
	estimation equations can be back-calculated to derive soil concentrations that resulted in a Tier-2 hazard quotient (HQ) value equal to the indicator threshold of 1.0. This process is simply the reverse of the "forward calculations" presented in the OU5 ERAs, in which a soil concentration enters the equations and the risk estimate is the outcome. The value selected as a site- and chemical-specific ecological RG is the concentration that results in an HQ≤1 for all wildlife receptors, derived using an effect-based TRV."
11) Pg 11, Sec 4.0, 2nd paragraph - this section will be rewritten based on the lawyer's comments, but shouldn't we add concentrations here? 4th paragraph - put in reference and add more wording Add text that we will backfill the site with clean fill	11) After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD, since monitoring implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action. Details regarding the protocol that will be followed to assure that clean backfill is used will be included in the Removal Action Work Plan.

Leticia Moore, U.S. EPA Assistant Regional Counsel (Received November 29, 2007)	**NAVFAC SW Response (February 5, 2008)**
Clarify what, if any, modifications are being made to the remedy selected in the ROD for groundwater. As currently drafted, the ESD suggested that the ROD is being modified to include further investigation of trichloroethylene or trichloroethene (TCE) in groundwater, in particular, future groundwater monitoring. However, the work planned for Site 1A suggests that only confirmation groundwater sampling is contemplated, during the soils work. Given that the ROD concluded that "[g]roundwater at Site 1A is considered protective of human health" (ROD, P. 2-21), modifications to the ROD to add future groundwater monitoring would require a ROD amendment, not an ESD. • See discussion of further investigation of TCE in groundwater at ESD, p.1. • See discussion of further groundwater monitoring to determine if TCE in groundwater poses an unacceptable risk at ESD, pp. 8, 11 and 12.	After discussion with the U.S. EPA Assistant Regional Counsel, DTSC Senior Staff Counsel, and NAVFAC Associate Counsel, the DoN has removed all references to groundwater monitoring from this ESD. The DoN concurs that the inclusion of groundwater monitoring in the ESD implies that a remedy for groundwater is necessary. However, if it appears that groundwater may be impacted during the course of the burn ash remedial excavation, the DoN will assess site conditions and determine an appropriate course of action.

APPENDIX E
TIER-3 EVALUATION OF REMEDIAL ALTERNATIVES
DERIVATION OF PRELIMINARY REMEDIATION GOALS
FOR ECOLOGICAL RESOURCES

EXECUTIVE SUMMARY

Ecological risk assessments (ERA) of sites in Operable Unit (OU) 5 of Marine Corps Base (MCB) Camp Pendleton (the Base) were previously conducted as part of an ongoing Remedial Investigation (RI) to address potential contamination at the Base (Parsons, 2004). The RI concluded that several chemicals are present at concentrations that are predicted to pose a potentially significant hazard to one or more ecological receptors at Site 1A-1 (antimony, lead, zinc, and dioxins[1]) and at Site 1111 (antimony, mercury, dioxins, and hexachlorobenzene). In accordance with United States Environmental Protection Agency (USEPA) and United States Navy (US Navy) guidance (USEPA, 1997; US Navy, 1999a,b,c,d,e), these chemicals require additional consideration for remedy development in a Tier-3 assessment (Evaluation of Remedial Alternatives).

This report presents the derivation of preliminary remediation goals (PRGs) for ecological resources (ecoPRGs) that are protective of the resources potentially at-risk at Site 1A-1 and at Site 1111, and documents the compliance with risk-management objectives for a voluntary interim remedial measure (a removal action) at Site 1111.

The site-specific ecoPRGs are:

- **Site 1A-1**
  - Antimony: 16 mg/kg
  - Lead: 73 mg/kg
  - Zinc: 254 mg/kg
  - Dioxins: 4.4E-05 mg/kg (44 pg/g)
- **Site 1111**
  - Antimony: 12 mg/kg
  - Mercury: 8.5 mg/kg
  - Dioxins: 4.4E-05 mg/kg (44 pg/g)
  - Hexachlorobenzene: 0.65 mg/kg.

These ecoPRGs provide one line of information for consideration, with respect to the nine CERCLA remedy evaluation criteria identified in the National Contingency Plan [NCP; 40CFR 300.430(e)(9)(iii)] during the Tier-3 Evaluation of Remedial Alternatives process.

[1] Dioxins include the 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and dibenzofurans.

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ACRONYMS

95%UCL	95th-percentile upper-confidence-limit on the mean
bgs	below ground surface
BERA	baseline ecological risk assessment
COPC	chemical of potential concern
CSM	conceptual site model
dw	dry weight
ecoPRG	ecological PRG
EPC	exposure-point concentration
ERA	ecological risk assessment
HQ	hazard quotient
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
NCP	National Contingency Plan
OU	operable unit
PRG	preliminary remediation goal
RI	remedial investigation
SRA	screening risk assessment
TCDD	tetrachlorodibenzo-p-dioxin
TEQ	toxicity equivalent
TRV	toxicity reference value
USEPA	United States Environmental Protection Agency

E1.0 INTRODUCTION

Ecological risk assessments (ERA) of sites in Operable Unit (OU) 5 of Marine Corps Base (MCB) Camp Pendleton (the Base) were previously conducted as part of an ongoing Remedial Investigation (RI) to address potential contamination at the Base (Parsons, 2004). The RI concluded that several chemicals are present at concentrations that are predicted to pose a potentially significant hazard to one or more ecological receptors at Site 1A-1 (antimony, lead, zinc, and dioxins[2]) and at Site 1111 (antimony, mercury, dioxins, and hexachlorobenzene). In accordance with United States Environmental Protection Agency (USEPA) and United States Navy (US Navy) guidance (USEPA, 1997; US Navy, 1999a–e), risk-management decisions were made that these chemicals require additional consideration for remedy development in a Tier-3 assessment (Evaluation of Remedial Alternatives).

This report presents the derivation of preliminary remediation goals (PRGs) that are protective of ecological resources (ecoPRGs) potentially at-risk at Site 1A-1 and at Site 1111, and documents the compliance with risk-management objectives assuming that contaminated soils are removed from Site 1111. The soils to be removed at Site 1111, as described in Section 4.6.2.3, are herein referred to as hot-spot soils.

The primary objectives of the ecological risk assessments previously conducted for these sites at the Base were to characterize ecological risks posed by site-related chemicals of potential concern (COPCs) and support remedial decisions regarding the need for remediation. The objectives of a Tier-3 evaluation are to evaluate alternative remedies for risk reduction and to support the selection of a preferred remedy. In support of the Tier-3 evaluation, this report:

- develops ecological PRGs to ensure protection of ecological resources if removal actions are chosen as the selected remedy for Site 1A-1;
- demonstrates compliance of residual risk at Site 1111 with risk-management goals, following removal of hot-spot soils; and
- develops ecological PRGs to ensure protection of ecological resources, confirmed by follow-up sampling conducted during the removal of hot-spot soils, in support of close-out decisions for “no further ecological investigation” at Site 1111.

E1.1 Tiered Approach to Ecological Risk Assessment in Support of Remedy Development

US Navy policy (US Navy, 1999a–e) for conducting ecological risk assessments outlines a three-tiered approach to characterizing ecological hazards at contaminated sites:

- **Tier 1 – Screening-Level Ecological Risk Assessment (SRA):** The Tier-1 SRA for the OU 5 sites employed existing site data and protective (“conservative”) assumptions to support decision(s) for (a) no further action, (b) further analysis in Tier 2, or (c) accelerated site remediation. Based on the potential for bioaccumulation or the screening ecotoxicity values exceeding the maximum detected concentrations of Tier-1 COPCs in soil, there were COPCs in

[2] “dioxins” include the 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxins and dibenzofurans.

soil at Site 1A-1 and at Site 1111 that warranted further evaluation in a Tier-2 Baseline Ecological Risk Assessment.

- **Tier 2 – Baseline Ecological Risk Assessment (BERA):** For those chemicals that were identified by the Tier-1 SRA as warranting further analysis, the Tier-2 BERA provided a scientifically based, defensible re-assessment of exposures and hazards at locations identified in the Tier-1 SRA. It employed less-conservative assumptions, yet developed more-realistic, site-specific estimates of potential ecological hazards in support of a decision that, from an ecological perspective, further evaluation of select COPCs was warranted for Tier 3.
- **Tier 3 – Evaluation of Remedial Alternatives:** Tier 3 evaluations focus on identifying a site-specific remedy that reduces ecological risk to acceptable levels. The Evaluation of Remedial Alternatives would also include, if warranted, discussions between Base and regulatory-agency staff to ensure that any remedial action be implemented in accordance with the Base's mission and with agency requirements (e.g., a Section 7 consultation with resource-agency staff may be appropriate to ensure protection of special-status species).

E1.2 Report Organization

The major subdivisions of this report include:

- **Section 1 – Introduction;**
- **Section 2 – Summary of Tier-1 and Tier-2 Ecological Risk Assessments:** This section presents a brief summary of the important elements of ERA developed for the RI (Parsons, 2004);
- **Section 3 – Site 1A-1:** This section develops ecological PRGs that demonstrate protection of ecological resources, as one component for risk managers to consider during the evaluation of remedial alternatives;
- **Section 4 – Site 1111:** This section demonstrates compliance with risk-management objectives (assuming removal of hot-spot soils is implemented), and develops ecological PRGs that demonstrate protection of ecological resources, as one component for risk managers to consider during the evaluation of remedial alternatives; and
- **Section 5 – References:** references cited within this report.

E2.0 SUMMARY OF THE ECOLOGICAL RISK ASSESSMENTS AND DEVELOPMENT OF PRGS

The US Navy's tiered approach to ERA was implemented within an overall conceptual framework for ERA developed initially by the USEPA (1992). Three principal steps of ERAs, as more-recently formalized (USEPA, 1997 and 1998), are problem formulation, analysis, and risk characterization. The details of the ERAs for Site 1A-1 and Site 1111 are provided in the RI (Appendix K, Parsons, 2004), but are briefly summarized below. The significant results of the ERAs then form the basis for the Tier-3 Assessment and development of ecological PRGs.

E2.1 Problem Formulation

Problem Formulation for the Tier-1 and Tier-2 ERAs included site characterization, receptor selection, identification and characterization of chemicals present at the location, and specification of Conceptual Site Models (CSMs). Sites 1A-1 and 1111 both are areas of habitat potentially utilized by organisms (ecological receptors) that may, in turn, be exposed to site-related contaminants. Thus, there are complete pathways for the potential exposure of receptors to site-related chemicals, and a quantitative analysis and risk-characterization were performed in accordance with the site-specific CSMs.

E2.2 Analysis

The Analysis phase of the ERAs included characterization of exposures and characterizations of ecological effects, and was based on the site-specific CSMs and assessment endpoints identified for these sites. The Exposure Characterizations quantified the concentrations or doses that receptors might encounter, based on the analytical results from soil samples collected from each site. The Effects Characterizations quantified the relationships between the concentration of a chemical and the potential for occurrence of adverse ecological effects in organisms, but was derived using literature-based toxicity information (not site-specific studies of environmental toxicity).

E2.3 Risk Characterization

Risk Characterization was the final process of ERAs, and involved three components: 1) risk estimation (an expression of the relationship between estimated site-specific exposures and the literature-based toxicity information), 2) uncertainty characterization (identification of key assumptions intrinsic to the process, and their influence), and 3) risk interpretation (integration of risk estimation, uncertainty, and information to support conclusions). Collectively, these steps were used to present the risk estimates in a scientific context for supporting the remedial decisions.

Based on the analyses conducted through Tiers 1 and 2 of the ERAs for the RI (Appendix K, Parsons, 2004), several chemicals are present at concentrations that were predicted to pose a potentially significant hazard to one or more ecological receptors:

- **Site 1A-1:** Inorganics (antimony, lead, and zinc) and dioxins; and
- **Site 1111:** Inorganics (antimony and mercury), dioxins, and hexachlorobenzene.

In accordance with guidance-directed conclusion options from the Tier-1 and Tier-2 ERAs, these COPCs require additional consideration for remedy development in a Tier-3 assessment, including the development of PRGs.

E2.4 Ecological PRGs

PRGs are risk-based media concentrations that represent target concentrations around which remedy development can begin (US Navy, 1999e). In accordance with the US Navy guidance (1999e), the exposure and effects information used in the Tier-2 BERAs can be used to develop a bounding range of concentrations for PRGs. Using the identical exposure algorithms and the no-effect and effect-based toxicity reference values (TRVs) used in the Tier-2 BERAs, risk-estimation equations can be “back-calculated” for the soil concentration that would result in a Tier-2 hazard quotient (HQ) value equal to the indicator threshold of 1.0. This process is simply the reverse of the “forward calculations” presented in the ERAs, in which a soil concentration enters the equations and the risk estimate is the outcome. The (receptor-specific) exposure portion of the risk-estimation equation would be identical regardless of the TRV, but the soil concentration giving rise to an HQ of 1 based on a no-effect TRV would represent a lower-bound estimate, below-which further remediation is not warranted for any exposure-point concentration. The PRG derived using an effect-based TRV would indicate an upper-bound limit above which further remediation might be necessary, if the exposure-point concentration for the area were greater than the PRG value. Exposure, for many receptors and particularly for wildlife, occurs over an exposure area, such that single-point concentrations of a chemical might be greater than a PRG value, but the overall integrated exposure estimate (e.g., a 95% upper confidence limit [UCL] for an exposure area) might be sufficiently protective against ecological hazards. Soil concentrations that fall between these limits might, or might not, indicate an unacceptable potential for ecological hazard, but such conclusions would require further explanation based on site-specific information.

The value selected as a site- and chemical-specific ecological PRG is the lowest of the ecoPRGs for any wildlife receptor, derived using an effect-based TRV. The rationale is that if the maximum residual concentration is at or below the ecoPRG, then the exposure for a population of mobile receptors within that area would never be at concentrations greater than the PRG and the exposure-point concentration (e.g., the 95%UCL) would always be within an acceptable range of concentrations that would not result in effect-based HQ values greater than one.

E3.0 SITE 1A-1

Site 1A-1 is a debris- and waste-disposal area approximately 800 feet northeast of Site 1A (a former waste burn pit addressed under OU 3). Site 1A-1 is located in an area of mixed sagebrush, arroyo willow/black willow, and ruderal (weedy, disturbed) vegetative communities, as indicated in a report for the nearby Site 1A (IT, 1999). The common plant species of the mixed sagebrush series include white and black sagebrush (*Artemisia spp*.), coyotebush, and buckwheat (*Eriogonum spp.*). The site itself, approximately 3 acres in size, is predominantly coastal sage scrub, with riparian woodland occurring along a nearby stream course. A few willow and sycamore trees are present. Disturbed habitat consists primarily of bare ground (primarily roadways), sparsely vegetated with mustard or non-native grasses (IT, 1999). The California coastal gnatcatcher and the least Bell's vireo (IT, 1999) and the southwestern willow flycatcher (MCB Camp Pendleton, 2001) are special-status species known to have been present near Site 1A-1.

E3.1 Site-Related COPCs

Thirty-seven samples were collected from soil less than 6 feet below ground surface (bgs) at Site 1A-1 and analyzed for a suite of inorganic and organic constituents, including dioxins. Based on the Tier-1 and Tier-2 ERAs (Appendix K, Parsons, 2004), the following were identified warranting Tier-3 evaluation:

- **Inorganics:**
  - antimony – is present at an average concentration of 7.5 mg/kg (ranging from 0.81 mg/kg to 57.5 mg/kg) in 0 to 1.5 feet bgs, and is present at an average concentration of 12.8 mg/kg (ranging from 0.81 mg/kg to 108 mg/kg) in 0 to 5 feet bgs. The exposure-point concentrations that triggered the Tier-3 evaluation were 95%UCLs on the mean equal to 13.5 mg/kg for the 0 to 1.5 feet bgs interval and at 19.3 mg/kg for the 0 to 5 feet bgs interval;
  - lead – is present at an average concentration of 609 mg/kg (ranging from 1.3 mg/kg to 7130 mg/kg) in 0 to 1.5 feet bgs, and is present at an average concentration of 918 mg/kg (ranging from 1.3 mg/kg to 9670 mg/kg) in 0 to 5 feet bgs. The 95%UCL exposure-point concentrations were 1240 mg/kg (0 to 1.5 feet bgs) and 1470 mg/kg (0 to 5 feet bgs);
  - zinc – is present at an average concentration of 990 mg/kg (ranging from 19.2 mg/kg to 8650 mg/kg) in 0 to 1.5 feet bgs, and is present at an average concentration of 1460 mg/kg (ranging from 11.5 mg/kg to 8650 mg/kg) in 0 to 5 feet bgs. The 95%UCL exposure-point concentrations were 1850 mg/kg (0 to 1.5 feet bgs) and 2180 mg/kg (0 to 5 feet bgs).
- **Dioxins** – are present in soil at maximum concentrations of 7.62×10^{-3} mg/kg for the avian toxicity equivalent (TEQ) concentration and 2.85×10^{-3} mg/kg for the mammalian TEQ concentration. These exposure-point concentrations were used as maximum concentrations because there was an insufficient number of samples to calculate 95%UCLs.

E3.2 Development of Ecological PRGs

Tier-2 exposure-point concentrations, background concentrations, and receptor-specific PRGs for Site 1A-1 are presented in Table E3-1.

Antimony: Most of the no-effect PRGs are below the background concentration of 8.8 mg/kg, indicating the conservatism of the assessment, most likely in toxicity assessment (i.e., the laboratory-based toxicity information is not representative of real animals in the natural environment). The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of deer mice, and is a value (16 mg/kg) about double the background concentration. The upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for antimony is approximately 16 mg/kg or less.

Lead: Most of the no-effect PRGs for wildlife are below the background concentration of 29.1 mg/kg, indicating the conservatism of the assessment, most likely in toxicity assessment (i.e., the laboratory-based toxicity information is not representative of real animals in the natural environment). The lowest no-effect PRG greater than background is for the invertivorous mammals (represented by the Southern grasshopper mouse), with a no-effect PRG concentration of 36 mg/kg. The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of the invertivorous birds (represented by least Bell's vireo), at a concentration of 73 mg/kg. The upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for lead is approximately 73 mg/kg or less.

Zinc: All of the no-effect PRGs for wildlife with small home ranges are below the background concentration of 111 mg/kg, indicating the conservatism of the assessment, most likely in toxicity assessment (*i.e.*, the laboratory-based toxicity information is not representative of real animals in the natural environment), and perhaps excessively so for this essential nutrient. The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of least Bell's vireo, and is a value (254 mg/kg) about double the background concentration. The upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for zinc is approximately 254 mg/kg or less. The nutritional needs of the wildlife receptors are not specifically known; however, the long-term maximum tolerable level of dietary zinc for domestic birds is 1000 mg/kg (NAS, 1980). For the least Bell's vireo (the most-sensitive receptor), the ecoPRG concentration in soil (254 mg/kg) would give rise to an estimated Tier-1 exposure dose of 109 mg/kg_{BW}–day and an estimated Tier-2 exposure dose of 172 mg/kg_{BW}–day, less than that maximum tolerable level.

Dioxins: The lowest of the no-effect PRGs for wildlife is 4.4×10^{-6} mg/kg (4.4 pg/g) for the hypothetical exposure of the deer mice population to soil-borne dioxins; the lowest of the effect-based ecoPRGs is also for hypothetical exposure of the deer mice population, at a concentration of 4.4×10^{-5} mg/kg (44 pg/g). The ten-fold difference in PRG values is strictly the result of the use of a ten-fold uncertainty factor applied to the same underlying toxicity data for the effect- and no-effect TRVs. The upper-bound limit for an acceptable exposure-point concentration for the dioxins (the ecoPRG) is approximately 4.4×10^{-5} mg/kg (44 pg/g) or less.

Placeholders

Table E3-1 Summary of Receptor-Specific Ecological Preliminary Remediation Goals, Site 1A-1

2 pages

E4.0 SITE 1111 ERA

Site 1111 is a location adjacent to the Former Pest-Control Washrack (IRP Site 3), near the Santa Margarita River. Site 1111 is less than one-half mile from the Santa Margarita River, and lies along a southwesterly flowing drainage that does empty to the river. The potentially affected area is approximately one acre. The site has been extensively sampled to characterize the lateral extent of contamination, and data to date do not indicate transport of contaminated soil to the river in this relatively flat area. This site is topographically level, and there are topographically elevated areas between the site and the Santa Margarita River, such that lateral movement of chemicals from site soil to the river is not likely. The site itself is in an area of coastal sage scrub and disturbed habitat (primarily non-native grassland), and lies adjacent to the riparian woodland along the Santa Margarita River. The riparian habitat along the Santa Margarita River supports a diverse community of bird, mammalian, amphibian, and reptilian wildlife. Approximately 10 to 20 mammal species and 80 resident and migratory bird species may regularly use the river corridor and might reasonably be expected to utilize the site. Eight to ten species of amphibian and reptiles probably occur in the site vicinity, including western toad (*Bufo boreas*) and common king snake (*Lampropeltis getulus*). The adjacent riparian habitats of the Santa Margarita River support threatened, endangered, or special-status wildlife species, including the arroyo toad, Pacific pocket mouse, southwestern pond turtle, least Bell's vireo, coastal California gnatcatcher, and southwestern willow flycatcher (SWDIV, 1993). To date, remedial activities at Site 1111 have been restricted to times outside of the breeding season for special-status birds and have had to avoid potential habitat for the arroyo toad. The undisturbed, unremediated area at and around Site 1111 is habitat for the arroyo toad, and is known to have hosted nesting least Bell's vireos and southwestern willow flycatchers; vegetation has been removed in the disturbed, remediated portion of Site 1111.

E4.1 Site-Related COPCs

As many as 98 samples were collected from soil less than 6 feet bgs at Site 1111 and analyzed for a suite of inorganic and organic constituents, including dioxins. Based on the Tier-1 and Tier-2 ERAs (Appendix K, Parsons, 2004), the following were identified warranting Tier-3 evaluation:

- **Inorganics:**
  - antimony – is present at an average concentration of 57.6 mg/kg (ranging from 0.22 mg/kg to 2260 mg/kg) in 0 to 1.5 feet bgs, and is present at an average concentration of 69.3 mg/kg (ranging from 0.22 mg/kg to 3210 mg/kg) in 0 to 5 feet bgs. The 95%UCL exposure-point concentrations were 170 mg/kg for 0 to 1.5 feet bgs and 3210 mg/kg for 0 to 5 feet bgs;
  - mercury – is present at an average concentration of 0.332 mg/kg (ranging from 0.013 mg/kg to 1.24 mg/kg) in 0 to 1.5 feet bgs soil, and is present at an average concentration of 33.5 mg/kg (ranging from 0.013 mg/kg to 3220 mg/kg) in 0 to 5 feet bgs. The 95%UCL exposure-point concentrations were 0.712 mg/kg for 0 to 1.5 feet bgs and 67.0 mg/kg for 0 to 5 feet bgs.
- **Dioxins** – are present at exposure-point concentrations of 1.82×10^{-4} mg/kg for the avian TEQ concentration and 1.34×10^{-4} mg/kg for the mammalian TEQ concentration in 0 to 1.5 feet bgs (both are maximum concentrations due to an insufficient number of samples for calculation of 95%UCLs), and are present at 95%UCL exposure-point concentrations of 1.10×10^{-2} mg/kg for the avian TEQ concentration and 9.27×10^{-3} for the mammalian TEQ concentration in 0 to 5 feet bgs.

- **Semivolatile Organic Compounds:** hexachlorobenzene is present at an average concentration of 0.36 mg/kg (ranging from .0001 mg/kg to 1.8 mg/kg) in 0 to 1.5 feet bgs, and is present at an average concentration of 0.18 mg/kg (ranging from 0.0001 mg/kg to 1.8 mg/kg) in 0 to 5 feet bgs. The exposure-point concentrations are a maximum concentration of 1.8 mg/kg for 0 to 1.5 feet bgs, and 95%UCL concentration of 0.54 mg/kg for 0 to 5 feet bgs.

E4.2 Removal of Hot-Spot Soils and Compliance with Risk-Management Targets

As indicated in the RI (Parsons, 2004), there is a defined area of soil (approximately 1,100 yards) at Site 1111 that contains significantly higher concentrations of COCs than the surrounding soils. This area is referred to as hot-spot soils. Removal of the hot-spot soils is considered in the remedial alternatives evaluated in this FS.

One option under consideration is the removal of hot-spot soils to mitigate potential threats to human health and the groundwater resource. If this removal were to occur, then the "conditions" evaluated in the Tier-2 BERA would no longer reflect the Site 1111 environment. To evaluate the potential effectiveness of such a removal, with respect to protection of ecological resources, the Site 1111 data were re-evaluated as if the removal had occurred (i.e., a "virtual remediation"). The samples within the area to be excavated were excluded from the Site 1111 data (see, for example, figures in Section 5 of the RI; Parsons, 2004), and exposure-point concentrations were re-calculated and re-run through the Tier-1 and Tier-2 ERA process. Samples from locations 1111B04, 1111B05, 1111MW-3, and 1111SB-02, -05, -06, -07, -08, -09, -9A, -17, -18, -19, and -32 were removed from the data set and summary statistics were regenerated (Table E4-1 [0 to 1.5 feet bgs] and Table E4-2 [0 to 5 feet bgs]). The "post-excavation" exposure-point concentrations were evaluated using the same computational approach as provided in the Tier-2 BERA; the summary results are provided in Table E4-3 (a Tier-1 evaluation of Tier-3 COPCs) and Table E4-4 (a Tier-2 evaluation of Tier-3 COPCs).

As Table E4-1 and Table E4-2 indicate, all detections of dioxins occurred in samples from the excavation area, and there are no residual detected concentrations for the "post-excavation" analysis. Thus, dioxins are no longer chemicals of concern for Site 1111 if the subject soils were to be removed to a depth of at least 5 feet bgs. As Table E4-3 indicates, the residual ("post-excavation") exposure-point concentration of antimony, 8.4 mg/kg, is below the background concentration, 8.8 mg/kg; therefore, antimony is also no longer a chemical of concern for Site 1111 if the subject soils were to be removed to a depth of at least 5 feet bgs.

If the "post-excavation" concentrations of mercury and hexachlorobenzene are evaluated in a Tier-2 assessment, then the concentrations of hexachlorobenzene do not exceed threshold HQ values of 1 for either no-effect-based or effect-based TRVs, nor are there any effect-based HQ values greater than one for mercury (Table E4-4). Thus, in conformity with conclusions reached during the Tier-1 and Tier-2 ERAs, these residual concentrations of hexachlorobenzene and mercury would not pose a substantive hazard to wildlife if the subject soils were to be removed to a depth of at least 5 feet bgs.

E4.3 Development of Ecological PRGs

Residual ("post-excavation") exposure-point concentrations, background concentrations, and receptor-specific PRGs for Site 1111 were developed to aid in post-excavation confirmation sampling and ensuring compliance with risk-management targets (ecological HQs=1). The ecoPRGs for Site 1111 were derived for all the Tier-3 COPCs, even though none are predicted to pose a hazard to ecological receptors if the proposed hot-spot soil removal were to occur. The ecoPRGs are presented in Table E4-5.

Antimony: Several of the no-effect PRGs are below the background concentration of 8.8 mg/kg, indicating the conservatism of the assessment. The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of invertivorous birds, and is a value (12 mg/kg) not much greater than the background concentration. The upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for antimony is approximately 12 mg/kg or less.

Mercury: Two of the no-effect PRGs are below the background concentration of 0.08 mg/kg, indicating the conservatism of the assessment. The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of herbivorous mammals, and thus, the upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for mercury is approximately 8.5 mg/kg or less.

Dioxins: The lowest of the no-effect PRGs for wildlife is 4.4×10^{-6} mg/kg (4.4 pg/g) for the hypothetical exposure of the deer mice population to soil-borne dioxins; the lowest of the effect-based PRGs is also for hypothetical exposure of the deer mice population, at a concentration of 4.4×10^{-5} mg/kg (44 pg/g). The ten-fold difference in PRG values is strictly the result of the use of a ten-fold uncertainty factor applied to the same underlying toxicity data for the effect- and no-effect TRVs. The upper-bound limit for an acceptable exposure-point concentration for the dioxins (the ecoPRG) is approximately 4.4×10^{-5} mg/kg (44 pg/g) or less.

Hexachlorobenzene: The lowest of the effect-based ecoPRGs for wildlife is for the hypothetical exposures of omnivorous small mammals (as represented by the deer mouse), and thus, the upper-bound limit for an acceptable exposure-point concentration (the ecoPRG) for hexachlorobenzene is approximately 0.65 mg/kg or less.

Placeholders

Table E4-1 Summary of Analytical Results for Soil Samples Collected at 0- to 1.5-ft bgs ("Post-Excavation"), Site 1111

Table E4-2 Summary of Analytical Results for Soil Samples Collected at 0- to 5-ft bgs ("Post-Excavation"), Site 1111

Table E4-3 Summary of Tier-1 Hazard Quotients for Ecological Receptors based on Tier-3 COPCs, Site 1111

Table E4-4 Summary of Tier-2 Hazard Quotients for Ecological Receptors based on Tier-3 COPCs, Site 1111 2 pages

Table E4-5 Summary of Receptor-Specific Ecological Preliminary Remediation Goals, Site 1111 2 pages

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