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CHAPTER 340
DEPARTMENT OF ENVIRONMENTAL QUALITY

FILING CAPTION: Hazardous Waste 2022 Rulemaking

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RULES:
340-012-0068, 340-100-0002, 340-100-0010, 340-100-0042, 340-100-0043, 340-101-0004, 340-102-0230, 340-105-0120

AMEND: 340-012-0068

RULE TITLE: Hazardous Waste Management and Disposal Classification of Violations

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Deleting "or hazardous waste pharmaceuticals" from (2)(a)

RULE TEXT:
(1) Class I:
(a) Failing to make or document a complete and accurate hazardous waste determination of a residue as required;
(b) Failing to meet Land Disposal Restriction (LDR) requirements when disposing of hazardous waste;
(c) Operating a hazardous waste treatment, storage or disposal facility (TSD) without first obtaining a permit or without having interim status;
(d) Treating, storing or accumulating hazardous waste in a hazardous waste management unit, as defined in 40 C.F.R. 260.10, that does not meet the unit design or unit integrity assessment criteria for the hazardous waste management unit;
(e) Accepting, transporting or offering for transport hazardous waste without a uniform hazardous waste manifest; (f) Transporting, or offering for transport, hazardous waste or hazardous waste to a facility not authorized or permitted to manage hazardous waste or hazardous waste pharmaceuticals;
(f) Transporting, or offering for transport, hazardous waste or hazardous waste pharmaceuticals to a facility not authorized or permitted to manage hazardous waste or hazardous waste pharmaceuticals;
(g) Failing to comply with management requirements for ignitable, reactive, or incompatible hazardous waste;
(h) Illegally treating or disposing of a hazardous waste;
(i) Failing to submit Land Disposal Restriction notifications;
(j) Failing to have and maintain a closure plan or post closure plan for a TSD facility, reverse distributor accumulating potentially creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals or for each regulated hazardous waste management unit, as defined in 40 C.F.R. 260.10, by the owner or operator of facility or unit;

(k) Failing to carry out closure or post closure plan requirements, by an owner or operator of a TSD facility, such that the certification for completing closure or post closure work is not submitted, or is incomplete, inaccurate, or non-compliant with the approved plans;

(l) Failing to establish or maintain financial assurance or hazard liability requirements in 40 C.F.R. 264.147 or 40 C.F.R. 265.147, by an owner or operator of a TSD facility;

(m) Failing to follow emergency procedures in a Contingency Plan or other emergency response requirements during an incident in which a hazardous waste or hazardous waste constituent is released to the environment or the incident presents a risk of harm to employees, emergency responders or the public;

(n) Failing to comply with the export requirements in 40 C.F.R. 262.52 for hazardous wastes, 40 C.F.R. 266.508(b) for non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals, or 40 C.F.R. 266.509(d) for potentially creditable hazardous waste pharmaceuticals;

(o) Failing to properly install a groundwater monitoring system in compliance with permit requirements, by an owner or operator of a TSD facility;

(p) Failing to properly control volatile organic hazardous waste emissions, by a large-quantity hazardous waste generator or TSD facility, when such failure could result in harm to employees, the public or the environment;

(q) Failing to inspect, operate, monitor, keep records or maintain in compliance with a permit: hazardous waste landfill units, incineration equipment, Subpart X treatment equipment, hazardous waste treatment units, pollution abatement equipment for hazardous waste treatment or disposal, or hazardous waste monitoring equipment;

(r) Failing to immediately clean up spills or releases or threatened spills or releases of hazardous waste, or hazardous waste pharmaceuticals, by any person having ownership or control over hazardous waste;

(s) Failing to submit an exception report for generators shipping hazardous waste, for healthcare facilities shipping non-creditable hazardous waste pharmaceuticals, or for reverse distributors shipping evaluated hazardous waste pharmaceuticals;

(t) Reuse in vehicles of defective airbag modules or defective airbag inflators subject to a recall;

(u) Failing to accurately determine generator status;

(v) Failing to notify or withdraw for healthcare facilities or reverse distributors;

(w) Failing to comply with the prohibition against sewering hazardous waste pharmaceuticals;

(x) Transporting, or offering for transport, hazardous waste other than potentially creditable hazardous waste to a facility other than a reverse distributor;

(y) Failing to submit an unauthorized waste report;

(z) Accepting hazardous waste pharmaceuticals at a facility not authorized or permitted to manage the specific type of hazardous waste pharmaceuticals received; or

(aa) Failing to provide confirmation to the healthcare facility or reverse distributor that shipment of potentially creditable hazardous waste pharmaceuticals has arrived at its destination and is under the control of the reverse distributor.

(2) Class II:

(a) Failing to place an accumulation start date on a container used for accumulation or storage of hazardous waste;

(b) Failing to label tanks or containers used for accumulation or storage of hazardous waste with “hazardous waste,” hazards of the contents, waste codes, or “hazardous waste pharmaceutical”;

(c) Failing to post required emergency response information next to the telephone, by a small quantity generator;

(d) Accumulating hazardous waste, non-creditable hazardous waste pharmaceuticals, potentially creditable hazardous waste pharmaceuticals, or evaluated hazardous waste pharmaceuticals more than thirty (30) days beyond the specified accumulation time frame;

(e) Failing to submit a manifest discrepancy report;

(f) Shipping hazardous waste on manifests that do not comply with DEQ rules;

(g) Failing to prevent the unknown or unauthorized entry of a person or livestock into the waste management area of a TSD facility or into a portion of a reverse distributor’s facility where potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals are kept;

(h) Failing to conduct required inspections at hazardous waste generator or reverse distributor accumulation sites or at hazardous waste permitted storage areas;

(i) Failing to prepare a contingency plan;

(j) Failing to comply with the requirements of a groundwater monitoring program, unless otherwise classified;

(k) Failing to maintain adequate aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination;

(l) Generating, treating, storing or disposing of hazardous waste, non-creditable hazardous waste pharmaceuticals, or evaluated hazardous waste pharmaceuticals, without complying with the Personnel Training requirements;

(m) Failing to keep containers of hazardous waste, non-creditable hazardous waste pharmaceuticals, or evaluated hazardous waste pharmaceuticals closed, except when adding or removing wastes;

(n) Failing to comply with the requirements for management of containers, including satellite accumulation, other than the requirements for ignitable, reactive or incompatible waste, by a hazardous waste generator, storage facility, health care facility, or reverse distributor;

(o) Failing to comply with the preparedness, prevention, contingency plan or emergency procedure requirements, unless otherwise classified;

(p) Failing to manage universal waste and waste pesticide residue in compliance with the universal waste management requirements or waste pesticide requirements;

(q) Failing to obtain a hazardous waste EPA identification number when required;

(r) Failing to comply with 40 C.F.R. 264 or 265 Subparts J, W or DD standards, other than unit design or unit integrity assessment;

(s) Failing to comply with 40 C.F.R. 264 or 265 Subparts AA, BB or CC standards for hazardous waste generator and TSD facilities, unless otherwise classified;

(t) Failing to timely submit an annual report by a hazardous waste generator, TSD facility, reverse distributor, or hazardous waste recycling facility;

(u) Failing to comply with recalled airbag recordkeeping, management, or disposal requirements, unless otherwise classified;

(v) Failing to timely notify DEQ of LQG closure;

(w) Failing to comply with episodic generation conditions, not otherwise classified; or

(x) Failing to notify, keep records, or other requirements for consolidation of VSQG waste at LQG owned by the same person, by the LQG.

(3) Class III:

(a) Accumulating hazardous waste, non-creditable hazardous waste pharmaceuticals, potentially creditable hazardous waste pharmaceuticals, or evaluated hazardous waste pharmaceuticals, up to thirty (30) days beyond the specified accumulation time frame;

(b) Failing to maintain on site, a copy of the one-time notification regarding hazardous waste that meets treatment standards by a hazardous waste generator; or

(c) Failing to submit a contingency plan to all police, fire, hospital and local emergency responders.

STATUTORY/OTHER AUTHORITY: ORS 459.995, 466.070 - 466.080, 466.625, 468.020

STATUTES/OTHER IMPLEMENTED: ORS 466.635 - 466.680, 466.990 - 466.994, 468.090 - 468.140

AMEND: 340-100-0002

RULE TITLE: Adoption of United States Environmental Protection Agency Hazardous Waste and Used Oil Management Regulations

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Updating the federal regulations adopted by reference.

RULE TEXT:

(1) Except as otherwise modified or specified by OAR 340, divisions 100 to 106, 109, 111, 113, 120, 124 and 142, the Commission adopts by reference, and requires every person subject to ORS 466.005 to 466.080 and 466.090 to 466.215, to comply with the rules and regulations governing the management of hazardous waste, including its generation, transportation, treatment, storage, recycling and disposal, as the United States Environmental Protection Agency prescribes in 40 C.F.R. Parts 260 to 268, 270, 273 and Subpart A and Subpart B of Part 124, as enacted through July 30, 2020, except as modified below in sections (2), (3) and (4).

(2) The Commission expressly adopts only 40 C.F.R. § 270.14(a) and § 270.28 as amended in adoption of 63 Federal Register 56710 (c174), October 22, 1998.

(3) The Commission excludes from the rules adopted in Section (1) of this rule, and does not adopt by reference 40 C.F.R. § 266.504(d), 40 C.F.R. § 260.2, 40 C.F.R. § 260.10 “contained,” and the amendments to 40 C.F.R. Parts 124, 260 to 268, 270 and 273 as enacted at:

(a) 63 Federal Register 56710-56735 (c174), October 22, 1998 (amendments to 40 C.F.R. § 264-265 and § 270(1)(c));
(b) 69 Federal Register 21737-21754 (c204), April 22, 2004;
(c) 69 Federal Register 62217-62224 (c204.1), October 25, 2004;
(d) 73 Federal Register 57-72 (c216), January 2, 2008;
(e) 73 Federal Register 64668-64788 (c219), October 30, 2008;
(f) 73 Federal Register 77954-78017 (c221), December 19, 2008;
(g) 79 Federal Register 350-364 (c230), January 3, 2014;
(h) 80 Federal Register 1694-1814 (c233D and E), January 13, 2015; and
(i) 83 Federal Register 24664-24671 (c233D and E), May 30, 2018.

(4) Except as otherwise modified or specified by OAR 340, division 111, the Commission adopts by reference, and requires every person subject to ORS 466.005 to 466.080 and 466.090 to 466.215, to comply with the rules and regulations governing the standards for managing used oil, the United States Environmental Protection Agency prescribes in 40 C.F.R. Part 279, enacted through July 30, 2003.

[COMMENT: The Department uses the federal preamble accompanying the federal regulations and federal guidance as a basis for regulatory decision-making.]

STATUTORY/OTHER AUTHORITY: ORS 465.009, 465.505, 466.020

STATUTES/OTHER IMPLEMENTED: ORS 465.003, 465.009, 465.505, 466.005, 466.075, 466.105

AMEND: 340-100-0010

RULE TITLE: Definitions

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Adding definition: (g) “Contained” means stored in a container, tank or containment building in compliance with the generator standards of 40 C.F.R. 262, or at a permitted TSDF.

RULE TEXT:

(1) The definitions in this rule modify, or are in addition to, the definitions contained in 40 C.F.R. § 260.10 and as specified below.

(2) When used in divisions 100 to 110 and 120 of this chapter, the following terms have the meanings given below:

(a) "Administrator" means:

(A) The "Department", except as specified in paragraph (2)(a)(B) or (C) of this rule;

(B) The "Commission," when used in 40 C.F.R. §§ 261.10 and 261.11; or

(C) The Administrator of the U.S. Environmental Protection Agency, when used in 40 C.F.R. § 262.50.

(b) "Aquatic LC50” (median aquatic lethal concentration) means that concentration of a substance which is expected in a specific time to kill 50 percent of an indigenous aquatic test population (e.g., fish, insects or other aquatic organisms). Aquatic LC50 is expressed in milligrams of the substance per liter of water.

(c) "Beneficiation of Ores and Minerals" means upgrading ores and minerals by purely physical processes (e.g., crushing, screening, settling, flotation, dewatering and drying) with the addition of other chemical products only to the extent that they are a non-hazardous aid to the physical process (such as flocculants and deflocculants added to a froth-flotation process).

(d) “CEG” or “conditionally exempt generator” or “conditionally exempt small quantity generator” is equivalent to very small quantity generator as defined under 40 C.F.R. 260.10.

(e) "Collection." See "Storage."

(f) "Commission" means the Environmental Quality Commission.

(g) “Contained” means stored in a container, tank or containment building in compliance with the generator standards of 40 C.F.R. 262, or at a permitted TSDF.

(h) "Demilitarization" means all processes and activities at the Umatilla Chemical Depot (OR 6213820917) and Umatilla Chemical Agent Disposal Facility (ORQ 000009431) from February 12, 1997, through Department approval of the closure of all permitted treatment, storage and disposal units and facility-wide corrective action.

(i) "Demilitarization Residue" means any solid waste generated by demilitarization processes and activities as defined in 340-100-0010(2)(f), except for:

(A) Waste streams generated from processes or activities prior to the introduction of nerve or blister agent into the treatment unit; and

(B) Waste steams generated from maintenance or operation of non-agent contaminated process utility systems.

(j) "Department" means the Department of Environmental Quality except it means the Commission when the context relates to a matter solely within the authority of the Commission such as: The adoption of rules and issuance of orders thereon pursuant to ORS 466.020, 466.075, and 466.510; the making of findings to support declassification of hazardous wastes pursuant to ORS 466.015(3); the issuance of exemptions pursuant to ORS 466.095(2); the issuance of disposal site permits pursuant to ORS 466.140(2); and the holding of hearings pursuant to ORS 466.130, 466.140(2), 466.170, 466.185, and 466.190.

(k) "Director" means:

(A) The "Department", except as specified in paragraph (2)(i)(B) of this rule; or

(B) The "permitting body", as defined in section (2) of this rule, when used in 40 C.F.R. §§ 124.5, 124.6, 124.8, 124.10, 124.12, 124.14, 124.15 and 124.17.

(l) "Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous waste or hazardous substance into or on any land or water so that the hazardous waste or hazardous substance or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters of the state as defined in ORS 468B.005.

(m) "Dry Cleaning Facility" means any facility as defined by 40 C.F.R. § 260.10 and adopted under OAR 340-100-0002, located in this state that is or was engaged in dry cleaning apparel and household fabrics for the general public, and dry stores, other than:

(A) A facility located on a United States military base;

(B) A uniform service or linen supply facility;

(C) A prison or other penal institution; or

(D) A facility engaged in dry cleaning operations only as a dry store and selling less than $50,000 per year of dry cleaning services.

(n) "Dry Cleaning Operator" means a person who has, or had, a business license to operate a dry cleaning facility or a business operation that a dry cleaning facility is a part of or any person that owns the dry cleaning business, leases the operation of the dry cleaning business from the owner, or makes any other kind of agreement or arrangement whereby they operated the dry cleaning business.

(o) "Dry Cleaning Wastewater" means water from the solvent/water separation process of the dry cleaning machine.

(p) "EPA" or "Environmental Protection Agency" means the Department of Environmental Quality.

(q) "EPA Form 8700-12" means EPA Form 8700-12 as modified by the Department.

(r) "Existing Hazardous Waste Management (HWM) Facility" or "Existing Facility" means a facility which was in operation or for which construction commenced on or before November 19, 1980, or is in existence on the effective date of statutory or regulatory changes under Oregon law that render the facility subject to the requirement to have a permit. A facility has commenced construction if:

(A) The owner or operator has obtained the federal, state, and local approvals or permits necessary to begin physical construction; and either

(B)(i) A continuous on-site, physical construction program has begun; or

(ii) The owner or operator has entered into contractual obligations - which cannot be canceled or modified without substantial loss - for physical construction of the facility to be completed within a reasonable time.

(s) "Extraction of Ores and Minerals" means the process of mining and removing ores and minerals from the earth.

(t) "Generator" means the person who, by virtue of ownership, management or control, is responsible for causing or allowing to be caused the creation of a hazardous waste.

(u) "Hazardous Substance" means any substance intended for use which may also be identified as hazardous under division 101.

(v) "Hazardous Waste" means a hazardous waste as defined in 40 C.F.R. 261.3, OAR 340-101-0033 and 340-102-0011.

(w) "Identification Number" means the number assigned by DEQ to each generator, transporter, and treatment, storage and disposal facility.

(x) “Ignitable” or “exhibits the characteristic of ignitability” means it is a liquid, other than a solution containing less than 24 percent ethyl alcohol by volume, at least 50 percent water by weight, and no other ignitable constituents, that has a flash point less than 60 (140) as determined under 40 C.F.R. 261.21(a)(1). Or if a representative sample of the waste has any of the properties referenced in 40 C.F.R. §§ 261.21(a)(2) through 262.21(a)(4).

(y) "License." See "Permit."

(z) "Management Facility" means a hazardous waste treatment, storage or disposal facility.

(aa) "Off-site" means any site which is not on-site.

(bb) "Oxidizer" means any substance such as a chlorate, permanganate, peroxide, or nitrate, that yields oxygen readily or otherwise acts to stimulate the combustion of organic matter (see 49 C.F.R. 173.127).

(cc) "Permitting Body" means:

(A) The Department of Environmental Quality, when the activity or action pertains to hazardous waste storage or treatment facility permits; or

(B) The Environmental Quality Commission, when the activity or action pertains to hazardous waste disposal facility permits.

(dd) "Permit" or "License" means the control document that contains the requirements of ORS Chapter 466 and OAR 340, divisions 104 to 106 and 120. Permit includes permit-by-rule and emergency permit. Permit does not include any permit which has not yet been the subject of final Department action, such as a draft permit or a proposed permit.

(ee) "RCRA" or "Resource Conservation and Recovery Act", when used to refer to a federal law, means Oregon law.

(ff) "RCRA Permit" means Oregon hazardous waste management facility permit.

(gg) "Regional Administrator" means:

(A) The "Department", except as specified in paragraph (2)(dd)(B) or (C) of this rule;

(B) The "permitting body", as defined in section (2) of this rule when used in 40 C.F.R. §§ 124.5, 124.6, 124.8, 124.10, 124.12, 124.14, 124.15 and 124.17;

(C) The "Commission", when used in 40 C.F.R. §§260.30 through 260.41.

(hh) "Residue" means solid waste as defined in 40 C.F.R. § 261.2.

(ii) "Site" means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

(jj) "Spill" means unauthorized disposal.

(kk) "Storage" or "Collection" means the containment of hazardous waste either on a temporary basis or for a period of years, in a manner that does not constitute disposal of the hazardous waste.

(ll) "Waste Management Unit" means a contiguous area of land on or in which waste is placed. A waste management unit is the largest area in which there is a significant likelihood of mixing of waste constituents in the same area. Usually, but not always, this is because each waste management unit is subject to a uniform set of management practices (e.g., one liner and leachate collection and removal system). The provisions in the OAR 340, Division 104 regulations (principally the technical standards in Subparts K–N of 40 C.F.R. Part 264) establish requirements that a person subject to these rules must implement on a unit-by-unit basis.

(3) When used in divisions 100 to 106, 109, 113 and 142 of this chapter, the following terms have the meanings given below:

(a) "Aeration" means a specific treatment for decontaminating an empty volatile substance container by removing the closure and placing the container in an inverted position for at least 24 hours.

(b) "Beneficial Use" means returning without processing unused pesticide product (e.g., pesticide equipment rinsing, excess spray mixture) or empty pesticide containers to the economic mainstream as a substitute for raw materials in an industrial process or as a commercial product (e.g., melting a container for scrap metal).

(c) "Department" means the Department of Environmental Quality.

(d) "Empty Container" means a container from which:

(A) All the contents have been removed that can be removed using the practices commonly employed to remove materials from that type of container; and

(B)(i) No more than one inch of residue remains on the bottom of the container; or

(ii) No more than three percent of the total capacity of the container remains in the container if the container is less than or equal to 110 gallons in size; or

(iii) No more than 0.3% of the total capacity of the container remains in the container or inner liner if the container is greater than 110 gallons in size; or

(iv) If the material is a compressed gas, the pressure in the container is atmospheric.

(e) "Household Use" means use by the home or dwelling owner in or around households (including single and multiple residences, hotels and motels).

(f) "Jet Rinsing" means a specific treatment for an empty container using the following procedure:

(A) A nozzle is inserted into the container, or the empty container is inverted over a nozzle such that all interior surfaces of the container can be rinsed; and

(B) The container is thoroughly rinsed using an appropriate solvent.

(g) "Multiple Rinsing" means a specific treatment for an empty container repeating the following procedure a minimum of three times:

(A) An appropriate solvent is placed in the container in an amount equal to at least 10% of the container volume; and

(B) The container is agitated to rinse all interior surfaces; and

(C) The container is opened and drained, allowing at least 30 seconds after drips start.

(h) "Pesticide" means any substance or combination of substances intended to defoliate plants or to prevent, destroy, repel, or mitigate insects, fungi, weeds, rodents, or predatory animals. Pesticide includes but is not limited to defoliants, desiccants, fungicides, herbicides, insecticides, and nematocides as defined by ORS 634.006.

(i) "Pesticide Equipment" means any equipment, machinery or device used in pesticide manufacture, repackaging, formulation, bulking and mixing, use, cleaning up spills, or preparation for use or application of pesticides, including but not limited to aircraft, ground spraying equipment, hoppers, tanks, booms and hoses.

(j) "Pesticide Residue" is a waste that is generated from pesticide operations and pesticide management, such as from pesticide use (except household use), manufacturing, repackaging, formulation, bulking and mixing, and spills.

(A) Pesticide residue includes, but is not limited to, unused commercial pesticides, tank or container bottoms or sludges, pesticide spray mixture, container rinsings\ and pesticide equipment washings, and substances generated from pesticide treatment, recycling, disposal, and rinsing spray and pesticide equipment.

(B) Pesticide residue does not include pesticide-containing materials that are used according to label instructions, and substances such as, but not limited to, treated soil, treated wood, foodstuff, water, vegetation, and treated seeds where pesticides were applied according to label instructions. Pesticide residue does not include wastes that are listed in 40 C.F.R. Part 261 Subpart D or that exhibit one or more of the characteristics identified in 40 C.F.R. Part 261 Subpart C.

(k) "Public-Use Airport" means an airport open to the flying public which may or may not be attended or have service available.

(l) "Reuse" means the return of a commodity to the economic mainstream for use in the same kind of application as before without change in its identity (e.g., a container used to repackage a pesticide formulation).

STATUTORY/OTHER AUTHORITY: ORS 465.009, 466.020

STATUTES/OTHER IMPLEMENTED: ORS 465.003, 465.009, 466.005, 466.075, 466.105

ADOPT: 340-100-0042

RULE TITLE: Variance Reporting

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: New rule for Variance Reporting.

RULE TEXT:

(1) The provisions of this rule replace the provisions of 40 C.F.R. § 260.42(a) and § 260.42(a)(5).

(2) The provisions of § 260.42(a)(5) are removed and reserved.

(3) Facilities managing materials under a variance must send a notification prior to operating under the regulatory provisions and by March 1 of each year.

STATUTORY/OTHER AUTHORITY: ORS 183, 459, ORS 465.009, 466.020, 468

STATUTES/OTHER IMPLEMENTED: ORS 465.009, 466.020, ORS 465.003, 466.005, 466.075, 466.105, 468.020

ADOPT: 340-100-0043

RULE TITLE: Legitimacy Criteria

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: New rule for Legitimacy Criteria.

RULE TEXT:

The provisions of this rule replace the provisions of 40 C.F.R. § 260.43(a)(3) “Where there is an analogous raw material, the hazardous secondary material must be “contained,” at a minimum, in a manner consistent with the management of the raw material or in an equally protective manner. Where there is no analogous raw material,” is deleted.

STATUTORY/OTHER AUTHORITY: ORS 183, 459, ORS 465.009, 466.020, 468

STATUTES/OTHER IMPLEMENTED: ORS 465.009, 466.020, ORS 465.003, 466.005, 466.075, 466.105, 468.020

AMEND: 340-101-0004

RULE TITLE: Exclusions

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Adding "(8) The provisions contained in 40 C.F.R 261.4(a)(23), (a)(24), (a)(25), and (a)(27) are deleted."

RULE TEXT:

(1) Residue described in 40 C.F.R. § 261.4(b)(9) is exempted from divisions 100-106 and 109.

(2) Dry cleaning wastewater subject to the requirements in OAR 340 division 124 is not excluded under 40 C.F.R. §§ 261.4(a)(1)(i) and (ii).

(3) The phrase “or labeled with equivalent wording describing the contents of the container and recognizing the exclusion” is added to the end of the first sentence in 40 C.F.R. § 261.4(a)(26)(i) and 40 C.F.R. § 261.4(b)(18)(i).

(4) The phrase “To a municipal solid waste landfill regulated under 40 C.F.R. part 258, including 40 C.F.R. § 258.40, or” is deleted from 40 C.F.R. § 261.4(b)(18)(vi)(A).

(5) The phrase “To a municipal waste combustor or other combustion facility regulated under section 129 of the Clean Air Act or” in 40 C.F.R. 261.4(b)(18)(vi)(B) is deleted.

(6) Selmet, Inc, or its corporate successor (Selmet). The following wastes are excluded under OAR 340-100-0020 and 340-100-0022:

(a) Wastewater treatment sludge, EPA Hazardous Waste No. F006, generated at Selmet’s facility in, Albany, Oregon, and contained in an on-site surface impoundment, as described in the delisting petition Selmet, Inc. provided on May 22, 2018. This is a one-time exclusion. [Note: The petition is attached as Appendix 1 to this rule.]

(b) Wastewater treatment sludge, EPA Hazardous Waste No. F006, generated at Selmet’s facility in Albany, Oregon, as described in the delisting petition Selmet, Inc. provided on May 22, 2018. The exemption is limited to a maximum annual rate of 3120 cubic yards per year. Selmet must have the sludge disposed of in a Subtitle D landfill the department licenses, permits, or otherwise authorizes to accept the delisted wastewater treatment sludge. [Note: The petition is attached as Appendix 1 to this rule.]

(c) The exemption described in subsection 6(b) of this rule remains in effect only as long as Selmet meets the following conditions:

(A) Delisting Levels: The constituent concentrations measured in a leachate extract may not exceed the following concentrations (mg/l): cadmium-0.2; chromium-4.9; nickel-32.7; cyanide-7.5 and fluoride-94.8.

(B) Annual Verification Testing: To verify that the waste does not exceed the specified delisting concentrations, Selmet, Inc. must collect and analyze one waste sample annually using methods with appropriate detection concentrations and elements of quality control. Selmet may use a total analysis of the waste to estimate the Toxicity Characteristic Leaching Procedure concentration as provided for in section 1.2 of Method 1311 as described in EPA SW 846. The Toxicity Characteristic Leaching Procedure is attached to this rule as Appendix 3.]

(d) Changes in Operation Conditions:

(A) If Selmet significantly changes the manufacturing process or the chemicals used in the manufacturing process, or both, Selmet must notify DEQ not more than 30 days after making the change.

(B) Selmet must handle the wastes generated after the process change as hazardous until DEQ notifies Selmet in writing that DEQ has determined the wastes continue to meet the delisting concentrations in subparagraph (6)(c)(A), that Selmet has demonstrated that no new hazardous constituents listed in appendix VIII of 40 C.F.R. part 261 have been introduced, and that the department approves Selmet’s not handling the wastes as hazardous.

(e) Data Submittals: Selmet must submit the data obtained through verification testing, or as required by other conditions of this rule, to DEQ. Selmet must submit the annual verification data and certification of proper disposal on the anniversary of the effective date of this exclusion. Selmet must compile, summarize, and maintain on site, for a minimum of five years, records of operating conditions and analytical data. Selmet must make these records available to DEQ for inspection. Selmet must submit with all data a signed copy of the certification statement described in 40 C.F.R.

§ 260.22(i)(12).

(f) Reopener Language:

(A) If, at any time after the delisted waste is disposed of, Selmet possesses, or is otherwise made aware of, any data, including but not limited to leachate data, about the delisted waste, indicating that any constituent is at a concentration in the leachate higher than the specified delisting concentration in subparagraph 6(c)(A), then Selmet must report such data, in writing, to DEQ, within 10 days of first possessing or being made aware of that data.

(B) Based on the information described in subsections (6)(d) and (6)(e), and any other information received from any source, DEQ will make a preliminary determination as to whether the reported information requires department action to protect human health or the environment. Further action may include suspending or revoking the exclusion, or other appropriate response necessary to protect human health and the environment.

(C) If DEQ determines that the reported information does require DEQ action, DEQ will notify Selmet in writing, of the actions DEQ believes are necessary to protect human health and the environment. The notice will include a statement of the proposed action and a statement providing Selmet with an opportunity to present information as to why the proposed DEQ action is not necessary or to suggest an alternative action. Selmet must provide to DEQ in writing its information in response to the notice within 30 days from the date DEQ mails its notice requesting the information.

(D) DEQ will issue a final written determination. DEQ will issue the written determination no sooner than 30 days after DEQ mailed its notice to Selmet. Before issuing its determination, DEQ will consider any additional information Selmet submitted to DEQ within 30 days after DEQ issued its notice. The written determination will describe DEQ's actions that are necessary to protect human health and the environment. Any required action described in DEQ's determination is effective immediately, unless DEQ provides otherwise.

(7) Pacific Cast Technologies, Inc., or its corporate successor (PCT). The following wastes are excluded under OAR 340-100-0020 and 340-100-0022:

(a) Wastewater treatment sludge, EPA Hazardous Waste No. F006, generated at PCT's, Albany, Oregon facility as described in the delisting petition PCT provided on April 11, 2019. The exemption is limited to a maximum annual rate of 9,000 cubic yards per year. PCT must have the sludge disposed of in a Subtitle D landfill that DEQ licenses, permits, or otherwise authorizes to accept the delisted wastewater treatment sludge. [Note: The petition is attached to this rule as Appendix 2.]

(b) The exemption described in OAR 340-101-0004(7)(a) remains in effect only as long as PCT meets the following conditions:

(A) Delisting Levels: The constituent concentrations measured in a leachate extract may not exceed the following concentrations (mg/l): cadmium-0.0911; chromium-2.27; nickel-13.5; and cyanide-3.08.

(B) Annual Verification Testing: To verify that the waste does not exceed the specified delisting concentrations, PCT must collect and analyze one waste sample annually using methods with appropriate detection limits and elements of quality control (similar to those in the delisting petition). PCT may use a total analysis of the waste to estimate the Toxicity Characteristic Leaching Procedure concentration as provided for in section 1.2 of Method 1311.

(c) Changes in Operation Conditions:

(A) If PCT significantly changes the manufacturing process or the chemicals used in the manufacturing process, or both, PCT must notify DEQ not more than 30 days after making the change.

(B) PCT must handle the wastes generated after the process change as hazardous until DEQ notifies PCT in writing DEQ has determined that the waste continues to meet the delisting concentrations in OAR 340-101-0004(7)(b)(A), that PCT has demonstrated that no new hazardous constituents listed in appendix VIII of 40 CFR part 261 have been introduced, and that the department approves PCT's not handling the wastes as hazardous.

(d) Data Submittals: PCT must submit the data obtained through verification testing, or as required by other conditions of this rule, to DEQ. PCT must submit the annual verification data and certification of proper disposal on the anniversary of the effective date of this exclusion. PCT must compile, summarize, and maintain on site, for a minimum of five years, records of operating conditions and analytical data. PCT must make these records available to DEQ for inspection. PCT must submit with all data a signed copy of the certification statement described in 40 C.F.R. §

260.22(i)(12).

(e) Reopener Language:

(A) If, at any time after the delisted waste is disposed of, PCT possesses, or is otherwise made aware of, any data, including but not limited to leachate data, about the delisted waste, indicating that any constituent is at a concentration in the leachate higher than the specified delisting concentration in paragraph 7(b)(A), then PCT must report such data, in writing, to DEQ, within 10 days of first possessing or being made aware of that data.

(B) Based on the information described in subsections (7)(b) and (7)(c), and any other information received from any source, DEQ will make a preliminary determination as to whether the reported information requires DEQ action to protect human health or the environment. Further action may include suspending or revoking the exclusion, or other appropriate response necessary to protect human health and the environment.

(C) If DEQ determines that the reported information does require DEQ action, DEQ will notify PCT in writing, of the actions DEQ believes are necessary to protect human health and the environment. The notice will include a statement of the proposed action and a statement providing PCT with an opportunity to present information as to why the proposed DEQ action is not necessary or to suggest an alternative action. PCT must provide to DEQ in writing its information in response to the notice within 30 days from the date the department mails its notice requesting the information.

(D) DEQ will issue a final written determination. DEQ may issue the determination at the later of either 30 days after it mailed notice to PCT, if PCT presented no additional information during that interval, or after reviewing any information Pacific submitted during the 30-day interval. The written determination will describe DEQ actions that are necessary to protect human health and the environment. Any required action described in DEQ's determination is effective immediately, unless the DEQ provides otherwise.

(8) The provisions contained in 40 C.F.R 261.4(a)(23), (a)(24), (a)(25), and (a)(27) are deleted.

[NOTE: View a PDF of Appendices by clicking on "Tables" link below.]

STATUTORY/OTHER AUTHORITY: ORS 192, 465.009, 466.015, 466.020, 466.075, 466.090, 466.180, 468.020, 646

STATUTES/OTHER IMPLEMENTED: ORS 466.015, 466.075, 466.195

State of Oregon Department of Environmental Quality

OAR 340-101-0004 Appendices

State of Oregon Department of Environmental Quality

OAR 340-101-0004

Appendix 1 – Selmet Petition

May 22, 2018

Brian Fuller
Hazardous & Solid Waste Manager
Oregon Department of Environmental Quality
165 East Seventh Avenue, Suite 100
Eugene, Oregon 97401

Re: Delisting Petition for F006 Hazardous Waste
Selmet, Inc.
Albany, OR

Dear Mr. Fuller,

On behalf of Selmet, Inc. (Selmet), SLR International Corporation (SLR) is pleased to present this delisting petition to request exclusion for the sludge generated from the Chemical Milling (Chem Mill) process as F006 hazardous waste. Two hard copies of the petition are enclosed, one electronic copy will be submitted via email, and a full electronic copy with all appendices will be submitted via FedEx.

None of the constituents (cadmium, nickel, complexed cyanide, and hexavalent chromium) for which F006 waste is listed as hazardous are used in the Chem Mill process. The two wastes sampled to represent the Chem Mill process sludge were the evaporation pond sediment and zero-liquid discharge (ZLD) liquid recycling system filter press cake. Concentrations of constituents of potential concern (COPCs) in the wastes were below hazardous levels.

The enclosed document was prepared following the Environmental Protection Agency's (EPA's) Resource Conservation and Recovery Act (RCRA) delisting petition process and includes support information in attached tables and appendices. Some pages have been included separately as confidential business information.

If you have any questions regarding this letter, please contact us at 503-723-4423.

Sincerely,

SLR International Corporation, 1800 Blankenship Road, Suite 440, West Linn, OR 97068
t 503 723 4423 w **slrconsulting.com**

SLR International Corporation

Tyler Weber, E.I.	Steven R. Hammer, P.E.
Project Engineer	Principal Engineer

cc Dan Lobato, DEQ
Seth Sadofsky, DEQ
Judy Turner, Selmet
Greg Sladcik, Selmet
Steve Locke, SLR

Enc Delisting Petition for F006 Hazardous Waste
Delisting Petition for F006 Hazardous Waste – Confidential Business Information

SELMET, INC., F006 WASTE DELISTING PROJECT

Delisting Petition for F006 Hazardous Waste

Prepared for: Selmet, Inc.
SLR Project No.: 108.00256.00029

May 2018

Delisting Petition for F006 Hazardous Waste

Prepared for:

Selmet, Inc.

33992 7 Mile Ln SE
Albany, Oregon 97322

This document has been prepared by SLR International Corporation. The material and data in this report were prepared under the supervision and direction of the undersigned.

Tyler Weber, E.I.
Project Engineer

Steven R. Hammer, P.E., P.Eng
Principal Engineer

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Pond Sludge Sample Collection

SLR collected evaporation pond sediment in accordance SW-846 field methods during events on April 12, 2018 and April 18, 2018. The pond was approximately half full of liquids during both sampling events. A random unbiased sampling strategy was used to characterize the sediment because the lateral spatial variability of the evaporation pond sediment was unknown. The lateral variability was expected to be minor. There was some vertical spatial variability expected as a result of chemistry changes to the pond throughout its existence. To capture the vertical spatial variability, samples were collected as complete sediment columns spanning from the water-sediment interface down to the sediment-native soil interface. Composite samples consisted of three aliquots. Each aliquot was collected randomly from a location on a two-dimensional grid. The grid consisted of 62, 20-foot square parcels laid over the pond footprint. The grid was divided into 4 sub-areas (north, north-central, south-central, and south) and a composite was taken from each sub-area to avoid random grouping for the aliquot locations.

Sediment samples were collected using a hand-core sediment sampler which allowed for a full sediment column to be captured. Four composite samples, each consisting of three aliquots, were collected and analyzed for total concentrations of COPCs which included metals, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), fluoride, cyanide, and hexavalent chromium. To avoid volatilization during compositing, discrete (grab) samples were taken from the final aliquot in each composite and analyzed for total volatile organic compounds (VOCs).

Analytical Results

Laboratory analytical testing was performed by ESC and Specialty. The total COPC concentrations in the sludge samples were compared to relevant DRAS maximum allowable total concentrations and also to Oregon Risk-Based Concentrations (RBCs) (collectively referred to as benchmark levels). Where concentrations exceeded 20 times the DRAS concentration, follow-up testing using the toxicity characteristic leachate procedure (TCLP) was performed, and TCLP concentrations were compared to relevant DRAS maximum allowable TCLP concentrations and RCRA toxicity characteristic regulatory levels.

Analytical results reported that total and TCLP concentrations detected above the reportable detection limits (RDLs) were below benchmark levels. The RDLs for four SVOCs and total PCB concentrations in one composite sample was above the DRAS benchmark level, but none of these constituents were detected above the RDL. Total and TCLP concentrations for COPCs were relatively consistent across multiple samples (see Tables 4A and 4B).

Conclusions

The analytical data from the Chem Mill process sludge and evaporation pond sediment sampling events support the claim that these sludges generated from treatment of Chem Mill process liquids are not hazardous and should not be classified as F006 hazardous wastes.

This result is not unexpected. The wastewater treatment processes for which the F006 listing was developed treat wastewaters from electroplating operations that contain metals such as cadmium, hexavalent chromium, nickel, and cyanide (complexed). Selmet does not use these chemicals. Titanium and additional metals found in the alloys are the only metals that are subjected to the processes at Selmet.

PART 1: DELISTING ADMINISTRATIVE INFORMATION

1. Name of Petitioner.
    a. Name of individual or firm submitting petition:

Selmet, Inc.

    b. Mailing address of individual or firm:

P.O. Box 689
33992 SE Seven Mile Lane
Albany, Oregon 97322
Telephone: (541) 926-7731 Fax: (541) 917-7401

2. People to contact for Additional Information Pertaining to this Petition.
    a. Name, Title, Telephone No.

Judy Turner, Environmental Health & Safety Manager, (541) 917-6356

    b. Mailing address of contact(s) if different from petitioner.

Not Applicable

3. Facility Responsible for Generating Petitioned Waste:

Selmet, Inc.
P.O. Box 689
33992 SE Seven Mile Lane
Albany, Oregon 97322
Telephone: (541) 926-7731 Fax: (541) 917-7401

RCRA ID number:

ORD009421579

4. Location of Petitioned Waste.

Same as facility name and address given in item 3.

5. Describe the proposed delisting action.

Selmet, Inc. (Selmet) has used the investment casting process to produce parts for the aerospace, medical, and golf industries. The parts have primarily been made of titanium alloys. A number of processes are used to produce the parts including a Chemical Milling (Chem Mill) process, which generates spent liquids and associated sludge. In 2017, Oregon DEQ informed Selmet that the sludge would be regulated under the Resource Recovery and Conservation Act (RCRA) as a F006 hazardous Waste.

Historically, the Chem Mill liquids were treated and then stored for recycling in a process liquid evaporation pond resulting in a buildup of sediment sludge at the pond bottom. Liquids from the Chem Mill are currently treated in a zero liquid discharge (ZLD) process liquids recycling system.

Selmet proposes to delist the F006 sediment located at the bottom of the evaporation pond and the ongoing Chem Mill process liquid sludge. The Chem Mill process does not utilize the chemicals for which F006 was listed (cadmium, hexavalent chromium, nickel, or complexed cyanides). In addition, the sludges do not exhibit any characteristics of a hazardous waste.

6. Provide a statement of the need and justification for the proposed action.

Laboratory analytical results have shown that the waste does not contain constituents of potential concern at hazardous concentrations and does not pose an unacceptable risk to human health or the environment. Managing the material as hazardous waste is an economic hardship. Selmet currently ships the waste over 200 miles to the Chemical Waste Management facility in Arlington, Oregon at a monthly cost of approximately $18,000, or $0.55/lb. When the material is delisted, Selmet plans to ship the waste approximately 20 miles to the Coffin Butte Landfill in Corvallis, Oregon at a monthly cost of approximately $1,600, or $0.05/lb.

7. Signed Certification Statement.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for getting the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for sending false information, including the possibility of fine and imprisonment.

Signed by Authorized Representative*

Signature: ____________________
Typed Name: **Greg Sladcik**
Title: **Facilities Manager**

*Note: An "authorized representative" is a person responsible for the overall operation of a facility or an operational unit (i.e., part of a facility), for example, a plant manager, superintendent, or person of equivalent responsibility.

PART 2: DELISTING WASTE AND WASTE MANAGEMENT INFORMATION

BASIS FOR THE WASTE LISTING

1. Which of the following scenarios best describes the petitioned waste? (Choose the most appropriate scenario and provide the information requested for the chosen scenario.)

   a. Petitioned waste is not a mixture of two or more listed hazardous wastes.

   Common name of petitioned waste:

   Chem Mill Process Sludge. One waste stream sampled consisted of ZLD filter press cake, and a second waste stream sampled consisted of evaporation pond sediment.

   EPA Hazardous Waste Number:

   F006

   Hazardous waste description:

   Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.

   b. Petitioned waste is a mixture of two or more listed hazardous wastes.

   Not Applicable

   c. Petitioned waste is a mixture of one or more solid non-hazardous wastes and one or more listed hazardous wastes, as described in 40 CFR 261.3(a)(2)(iii-iv).

   Not Applicable

   d. Petitioned waste is generated from the treatment, storage, or disposal of one or more listed hazardous wastes (or solid non-hazardous and listed hazardous waste mixture), as described in 40 CFR 261.3(c)(2)(i)

   Not Applicable

2. Describe the physical form of the petitioned waste (e.g., solid, liquid)

The ZLD filter press cake is a solid; it is a dewatered sludge that has a clayey consistency. The evaporation pond sediment is also a solid; it is sediment with a silty-clay consistency. The evaporation pond will be drained and the sediment dewatered prior to disposal.

3. If the physical form is sludge or liquid, estimate based on waste analysis the percentage of solids (e.g., provide a range).

Analytical results indicate that the percent solids of the ZLD filter press cake range from 41.7% to 73.9% and the percent solids for the evaporation pond sediment range from 19.1% to 62.2%.

HISTORY OF WASTE GENERATION

4. Which of the following describes the generation of petitioned waste: (Indicate those that apply and provide the information requested for each item.)
   a. Waste has been generated in the past.
   Provide the year when waste was first generated:

   Not Applicable

   Provide the year when waste generation ended (if applicable):

   Not Applicable

   b. Waste is presently being generated.
   Provide the year when waste was first generated:

   2014 (ZLD filter press cake)

   c. Waste will be generated in the future:

   The evaporation pond sediment will be generated during a one-time pond closure, expected to be in 2018.
   The filter press cake will be generated for the foreseeable future.

VOLUME OF PETITIONED WASTE

5. Is the petition for a waste of fixed quantity (e.g. a discrete volume of waste contained in a unit)?

Yes (Evaporation pond sediment)	[Answer item 5a]
No (Filter press cake)	[Answer item 5b]

a. Petitioned waste is/will be a fixed quantity.

Estimated volume:

The estimated volume of the evaporation pond sediment is approximately 3,800 cubic yards.

Describe the method of volume estimate:

The volume of evaporation pond sediment was estimated by multiplying the surface area of pond footprint (25,500 square feet (ft)) by the observed sludge thickness (2 ft). The surface area of the pond was estimated using google earth and field measurements. The pond sediment thickness was based on measurements conducted during multiple pond sediment investigations and sampling events. A contingency factor of two has been added to account for the "fluff" factor between excavated and in-place material and uncertainty in the sediment depth in areas not observed during sampling events.

b. Petitioned waste is/will be generated on a routine or continuous basis.

The filter press cake will be generated on a routine basis. The approximate generation rate is shown below:

	Average Quantity	**Maximum Quantity**	**Unit of measurement**
Monthly Volume	**87**	**260**	**Cubic yards**
Annual Volume	**1,040**	**3,120**	**Cubic yards**

Describe the method of volume estimation:

The average annual volume was estimated by assuming one 20-cubic yard roll off will be generated at a maximum rate of once per week, i.e. 52 roll-offs per year. The average annual volume was multiplied by a contingency factor of three to account for increased process throughput. The Chem Mill process is not anticipated to change; however, Selmet plans to continue to expand production in the next decade.

The average and maximum monthly volumes were estimated by dividing the average and maximum annual quantities by 12, respectively. The maximum volume values were used as the input for DRAS when evaluating the analytical data compared to maximum allowable concentrations.

HISTORY OF WASTE MANAGEMENT

6. As appropriate, describe the present, past, and proposed waste management methods for the petitioned waste.

   a. Present waste management methods and off-site facility or facilities used (name, address, and waste management method).

      Filter press cake is removed mechanically from a frame filter press into a rolling waste dumpster inside the ZLD recycling building. This dumpster is then emptied into a nearby 20-cubic yard roll-off using a forklift. The 20-cubic yard roll-off is stored in the 90-day accumulation area on an asphalt road and shipped offsite approximately every 10 days. The waste is currently shipped to the Chemical Waste Management (CWM) facility located at 17629 Cedar Springs Lane in Arlington, Oregon, for disposal in a RCRA permitted hazardous waste landfill.

      Evaporation pond sediment has not previously been generated.

   b. Past waste management methods, if different from present, and off-site facility or facilities used (name, address, and waste management method).

      Prior to DEQ's reevaluation of Oregon's titanium casting facility processes, DEQ did not consider the sludge generated from the Selmet Chem Mill process to be an F006 listed hazardous waste. As such, Selmet shipped the filter press cake to the Coffin Butte landfill located at 28972 Coffin Butte Rd in Corvallis, Oregon for disposal as non-hazardous waste.

      Evaporation pond sediment has not previously been generated.

   c. Proposed waste management methods if delisting petition is granted and off-site facility or facilities to be used (name, address, and waste management method).

      If delisting is approved, Selmet will ship the filter press cake and evaporation pond sediment to the Coffin Butte landfill located at 28972 Coffin Butte Rd in Corvallis, Oregon or an equivalent Subtitle D landfill.

PART 3: GENERAL OPERATIONS AT THE GENERATING FACILITY

1. Describe facility business area(s) and operations. Include SIC code(s).

   SIC Code(s):

   3728

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(If the petitioned waste is managed in more than one unit, assign a number to each unit (e.g., Unit #1, Unit #2, etc.) and use the unit numbers to associate a description with a specific unit.)

a. Unit location/address (show if on- or off-site).

Not applicable. Landfill is not owned or operated by Selmet.

b. Description of unit construction (current design and materials).

Not applicable. Landfill is not owned or operated by Selmet.

c. History of unit design (e.g., chronological summary of any changes to original construction).

Not applicable. Landfill is not owned or operated by Selmet.

d. Purpose and description of any unit design and operating changes.

Not applicable. Landfill is not owned or operated by Selmet.

e. Estimated surface area.

Not applicable. Landfill is not owned or operated by Selmet.

f. Estimated unit capacity volume.

Not applicable. Landfill is not owned or operated by Selmet.

g. Listing of waste and material inputs which have occurred throughout the life of the unit, if known.

Not applicable. Landfill is not owned or operated by Selmet.

24. Provide detailed schematic(s) of the waste unit(s) showing (as appropriate) unit dimensions, influent point(s), effluent point(s), and waste thickness.

Not applicable. Landfill is not owned or operated by Selmet.

PROCESS MATERIALS

25. List all materials used in the operations that contribute to the petitioned waste. The list should include:

a. The name of the material(s).

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31. Describe the impact of those differences on the character of the petitioned waste.

Not applicable.

32. Are you requesting an exclusion for a waste generated by a multiple waste treatment facility (MWTF)?

Not applicable.

33. Describe your procedure for prescreening clients and wastes and how this procedure will be carried out should your waste be excluded.

Not applicable.

34. Describe the procedures by which you will make sure that: (1) treatment levels needed by an exclusion are maintained and (2) a hazardous waste is not disposed improperly as non-hazardous.

Not applicable.

PART 4: DELISTING ANALYTICAL PLAN DEVELOPMENT

1. Provide a complete list of the constituents and parameters of concern identified for your petitioned waste based on appropriate waste constituent analyses and the results of an engineering analysis. Identify those constituents quantitated by laboratory analysis and those quantitated using mass balance demonstrations.

SLR considered the following resources when developing a list of constituents and parameters of concern:

- **"RCRA Hazardous Waste Delisting Program - Useful Information for the Petitioner" (USEPA 2009) and referenced materials including:**
  - **Appendix IX of 40 CFR part 264 – Groundwater Monitoring List**
  - **Appendix VIII of 40 CFR part 261 – Hazardous Constituents List**
  - **Chemicals explicitly listed in USEPA 1993 guidance including acetone, ethylbenzene, isophorone, 4-methyl-2-pentanone, styrene, and xylenes**
- **"Hazardous Waste Delisting Risk Assessment Software (DRAS)" and the associated "Users Guide for DRAS Version 3.0" (USEPA 2010).**

SLR interviewed Selmet staff and developed a comprehensive summary of site operations dating back to development of the site in 1967. SLR then worked alongside DEQ to create a list of relevant chemicals that would be quantitated using laboratory analytical testing. The list was created following comprehensive review of the information provided in interviews and facility Material Safety Data Sheets (MSDSs). Constituents were not included in the list if historical interviews suggested the

constituent was not historically used at the site, if the constituent was not found in facility MSDSs, or if the constituent was unrelated to the F006 hazardous waste listing (USEPA 2009. pg. 15).

Lists of constituents and parameters of concern to undergo analytical testing for the Chem Mill process sludge and evaporation pond sediment samples were included in the Sampling and Analysis Plans (SAPs) submitted to DEQ for each waste. As described above, constituents that were not reasonably expected to be present in the wastes and/or unrelated to the F006 hazardous waste listing were not included in the analytical plan. The SAPs were approved by DEQ in an email dated March 15, 2018.

Concentrations of the constituents of concern were individually compared to the maximum allowable concentrations reported by the DRAS to determine if the waste was a candidate for delisting. According to the USEPA 2008 RCRA Delisting Technical Support Document, the waste may qualify to exit the hazardous waste management program if concentrations are below these values (USEPA 2008, pgs. 4-9). A DRAS analysis run was performed for the evaporation pond sediment and filter press cake using the highest reported concentrations of each COPC (see appendix J). Total and TCLP results were also compared to the D-list of the RCRA characteristic hazardous waste concentrations according to Title 40 CFR, Section 302.4 and to the relevant Oregon Risk-Based Concentration (RBC) tables for the following exposure pathways for an occupational and construction worker receptor scenario (DEQ, 2017):

- Soil ingestion, Dermal Contact, and Inhalation (RBC_{SS}) and
- Volatilization to Outdoor Air (RBC_{SO}).

The DRAS required inputs characteristic of the Chem Mill process sludge, evaporation pond sediment, and receiving waste management units to generate maximum allowable concentrations. The inputs required included:

- Waste Management Type
- Waste Volume
- Cancer Risk Level
- Hazard Quotient
- Waste Management Unit Active Life
- Active Life

Table 4.1, below, shows the inputs entered into DRAS for the Chem Mill process sludge:

TABLE 4.1 – DRAS INPUTS FOR WASTE EVALUATION

Waste	Waste Management Type	Waste Volume (yd^3)	Cancer Risk Level	Hazard Quotient	Waste Management Unit Type	Active Life (years)
Evaporation Pond Sediment	**Landfill**	**3,800**	**1E-6**	**1.0**	**One Year Batch**	**N/A**
Chem Mill Process Sludge	**Landfill**	**3,120**	**1E-6**	**1.0**	**Multiple Year Batch**	**20**

Prior to laboratory analytical testing, Selmet compared MRLs for each constituent test method to the maximum allowable total and TCLP concentrations reported by DRAS and the D-List for RCRA characteristic hazardous waste to verify that appropriate test methods were assigned to each constituent.

Samples collected were first analyzed for total concentrations of the constituents of concern. A contingency sample for follow-up TCLP laboratory analytical testing was also collected. A constituent with a total concentration above the laboratory method reporting limit (MRL) and a total concentration greater than 20 times the DRAS maximum allowable TCLP concentration or the D-List Hazardous Characteristic concentration underwent subsequent TCLP laboratory quantitative analysis. TCLP testing was not performed if the total concentration of a constituent was less than 20 times the concentration of the benchmarks because the test method dilutes the sample by 20 times to simulate landfill leachate conditions (USEPA 1992, section 2.2).

The SAPs list the chemicals considered when developing a list of constituents and parameters of concern. Table 3A and 3B list the constituents and parameters of potential concern identified to be quantitated using laboratory analytical testing following an engineering analysis for the Chem Mill process sludge and evaporation pond sediment, respectively. Tables 4A and 4B include analytical data along with maximum allowable total concentrations, DRAS maximum allowable TCLP concentrations, RCRA D-List characteristic hazardous waste concentrations, and Oregon RBC concentrations for the relevant constituents. An electronic copy of the DRAS analysis for the evaporation pond sediment and filter press cake is included in Appendix J.

2. Provide mass balance demonstrations for those constituents of concern in your list for which analyses were not conducted. Provide all calculations and assumptions.

Mass balances were not used for determining a list of constituents of concern.

3. Explain why any other delisting constituent of concern is not on the constituent of concern list for your petitioned waste.

   USEPA regulations and guidance, including the DRAS, were used to develop an initial comprehensive list of constituents of potential concern for consideration. The initial list of constituents for consideration was then evaluated using historical data and generator knowledge of plant process operations. Many of these constituents were removed from the list of constituents to undergo laboratory analytical testing because they were absent from raw materials used in current or historical operations at the facility and were therefore not reasonably expected to be present in the waste (USEPA 2009, pg. 15). The final list of constituents to undergo analytical testing was approved by DEQ in emails dated March 15, 2018.

   Analyses of the processes related to the waste generation and analytical data indicated that the waste does not exhibit the characteristics of ignitable (D001), corrosive (D002), reactive (D003), or toxic hazardous waste (D004 through D043).

4. Explain why your petitioned waste does not exhibit any hazardous waste characteristic for which analysis was not conducted.

   The constituents excluded from analytical laboratory analysis are not reasonably expected to be present in the wastes at hazardous levels following a thorough engineering and MSDS review.

PART 5: DELISTING SAMPLE AND ANALYSIS INFORMATION

1. Has a draft sampling and analysis plan been submitted to EPA/DEQ for review before petition preparation?

   Yes [Answer items 1a and 1b]

   a. Submittal date of sampling and analysis plan:

      March 14, 2018

   b. Log number assigned by EPA to your draft submittal:

      Not Applicable, submitted to the Oregon DEQ. The SAPs were approved by DEQ in an email dated March 15, 2018.

WASTE SAMPLING INFORMATION

2. Were all sampling-related activities performed by in-house staff?

   No [Answer items 2a and 2b]

a. Name and address of the organization(s) or company(s) responsible for designing the sampling strategy and collecting the samples.

**SLR International Corporation
1800 Blankenship Road, Suite 440
West Linn, Oregon 97068**

b. For each individual person (in-house and otherwise) who designed the sampling plan, the quality control plan, and/or participated in sample collection, please provide a resume of qualifications and the following information:

Name: **Steven Hammer, P.E., P.Eng (SLR International Corporation)**
Title: **Principal Engineer (Prepared SAP, Managed Project)**

Name: **Tyler Weber, E.I. (SLR International Corporation)**
Title: **Project Engineer (Prepared SAP, Participated in Sample Collection)**

Title: **Justin Moman, P.E. (SLR International Corporation)**
Title: **Associate Engineer (Participated in Sample Collection)**

SAMPLING STRATEGY

3. Provide the following information (items 3a through 3f) on the sampling strategy you followed to make sure that the samples were representative.

a. Identify which process point discharges, containment areas (e.g., lagoons), or other areas (e.g., soil) were sampled and why these areas were selected for sample collection.

Selmet collected samples from the filter press cake roll-off representative of the filter press cake disposed in a landfill. Selmet also sampled the evaporation pond sediment to identify the waste composition of sludge historically generated prior to the operation of the ZLD liquid recycling system.

b. Describe the techniques and guidelines used to select waste sampling points (e.g., random sampling procedure or fixed transect and offset sampling procedure).

In accordance with the RCRA Waste Sampling Draft Technical Guidance (USEPA 2002, pg. 57), random unbiased composite sampling techniques were used to sample waste representing the Chem Mill process sludge and evaporation pond sediment.

c. Describe the sampling and subsampling (i.e., transferring of sample aliquots into containers specific to certain analyses) procedures used during the sample collection process, including the particular days and times selected for sample collection, the number of grab samples collected for each composite sample, and why these procedures were used.

Chem Mill Process Sludge

For the samples representing the Chem Mill sludge, a random unbiased sampling strategy was used. Random unbiased sampling is best suited for sampling a waste that has is not reasonably expected to have spatial variability. Selmet collected four composite samples from the 20-cubic yard filter press cake waste roll-offs, each separated by duration of approximately 10 days. Samples were taken over these four consecutive periods of generation to capture temporal waste variability, in accordance with the 2009 USEPA delisting guidance (USEPA, 2009, pg. 16). The samples were collected mid-day on March 22, 2018, April 2, 2018, April 12, 2018, and April 20, 2018. Sampling was performed while the roll-off was located in the waste accumulation storage area prior to offsite shipment.

Each composite sample consisted of 5 aliquots from the same waste bin. Locations of the aliquots within the bin were randomly selected from the grid formation, consisting of approximately 1-ft "squares" overlain on the waste top surface. The dimension of the roll-offs was 15 ft by 8 ft by 4 ft. Each "square" in the grid was assigned a number, and a random number generator was be used to determine which "square" the aliquot samples were taken from (USEPA 2002, pg. 57). A tape measure was used to identify the location of each aliquot. A small portable scissor lift was maneuvered over the open top of the roll-off to provide a safe platform for standing while the samples were collected. This procedure was performed to represent the contents of the entire roll-off. Appendix B includes the diagrams and random number tables for each composite sample. The random number table used was provided by the 1993 USEPA delisting guidance document (USEPA, 1993, pg. 147).

Samples were collected from the platform of the portable lift using a decontaminated stainless-steel hand-auger. Decontaminated stainless steel extension rods were used to advance the auger bucket from the waste surface, down to the bottom of the bin. Equipment was not decontaminated between aliquot locations because these were combined to create a composite sample. Complete columns of filter press cake were collected for each aliquot sample to capture vertical spatial variability in the waste. Depending on the height of the waste at a specific aliquot location, this consisted of 2-3 core depths. Aliquots were collected and placed in a decontaminated high-density polyethylene (HDPE) 5-gallon bucket and mixed together using a decontaminated stainless steel spoon until the mixture was homogenous.

The hand bucket used to collect the samples had an outside diameter of 2 inches. The auger bucket was 8.25 inches (9.5 inches including teeth) in length. The volume of the auger bucket was approximately 15 oz. For each event, the following containers were filled for laboratory analysis:

- **(1) 2-oz jar**

- (1) 4-oz jar
- (2) 8-oz jars

An additional two (2), 8-oz jars were collected during the Period 1 event as contingency containers to ensure adequate volume was provided to labs for testing. None of the containers for the filter press cake sampling contained preservatives.

Evaporation Pond Sediment

For the samples representing the evaporation pond sediment, a random unbiased sampling strategy was also used. This is because the lateral spatial variability was expected to be minor throughout the sediment; records also indicate Selmet historically used pond aerators to keep the pond well-mixed. Some vertical spatial variability was expected in the sediment as a result of chemistry changes to the pond throughout its lifetime. Therefore, discrete samples and composite aliquots were collected as complete sediment columns spanning from the water-sediment interface down to the sediment-native soil interface. The depth of the sediment cores was approximately 1 to 2 ft.

Four composite samples were collected from the evaporation pond sediment. To capture spatial variability that may exist, composite samples collected from the pond consisted of three aliquots. Aliquots were collected from randomly selected areas from a two-dimensional grid consisting of 62, 20-ft square parcels. A discrete sample was collected from the third aliquot location of every composite sample for VOC analysis.

Appendix B includes the diagrams and random number tables for each sample. The random number table used was provided by the 1993 USEPA delisting guidance document (USEPA, 1993, pg. 147).

Each square in the two-dimensional grid was assigned a number (1 through 62). The grid squares were then divided into four groups, and three squares from each group were chosen randomly as squares from which sample aliquots for a composite sample will be collected. Groups included:

- Composite A (squares 1 to 16)
- Composite B (squares 17 to 31)
- Composite C (squares 32 to 45)
- Composite D (squares 46 to 62)

Sediment samples near the shoreline were collected on foot. Sediment samples located deeper in the pond were sampled using a small water craft. The water craft was positioned by aligning a rope across the width of the pond, intersecting the aliquot location. The rope was marked off to guide the sampler to the correct width of the pond to collect the sample from. Samples were collected from as close to the center of the grid location as possible. All aliquot samples were taken from submerged locations.

Sediment samples were collected using a decontaminated 48-inch stainless steel hand-core sediment sampler with disposal eggshell catchers and plastic liners. For samples collected where the pond depth was greater than 3 ft, a decontaminated extension rod was used to advance the sediment sampler down to interface of the sediment and native soil.

The liner had an outside diameter of 2 inches and a length of 48 inches. The volume of the liner was approximately 83 oz. A check valve on the top of the device allowed for displacement of the water column as the device was driven into the sediment and kept solids from being washed out of the device as it was vertically removed from the pond liquids.

Equipment was not decontaminated between aliquot locations because these were combined to create a composite sample. Complete columns of the sediment were collected for each aliquot sample to capture vertical spatial variability in the waste. Aliquots were collected and placed in a decontaminated HDPE 5-gallon bucket and mixed together until the mixture was homogenous using a decontaminated stainless steel spoon.

The sampling device did not encounter considerable resistance as it was driven into the sediment until the native soils were encountered. When increased resistance was observed, the device was carefully removed from the sediment to retain material captured in the device. Depending on the depth of the sediment at the aliquot location, 1 to 2 ft of sediment was retained in the liner. The threaded end of the device was then removed to access the liner and the solids were emptied into a 5-gallon HDPE bucket.

For aliquots identified as locations for VOC discrete samples, a sample was immediately collected from the material using a 5035 terracore sampling kit in accordance with SW-846 (USEAP, 1996) and one (1) 8-oz jar for TCLP follow-up. The sample containers consisted of the following:

- (3) 40-mL vials with sodium bisulfate preservative as part of the 5035 TerraCore kit
- (1) 40-mL vial with methanol preservative as part of the 5035 TerraCore kit
- (1) 2-oz jar as part of the 5035 TerraCore kit
- (1) T-handle for collecting material as part of the 5035 TerraCore kit
- (1) 8-oz jar

After the material had been emptied from the sediment sampler into a clean, 5-gallon HDPE bucket, the T-bar handle was inserted into the waste and the material collected was transferred a single volume into a VOA vial. This procedure was repeated for the remaining three VOA vials. The 2-oz jar was then filled with material directly from the core. An 8-oz glass jar was also filled with material directly from the core for follow-up TCLP analysis.

The remaining material was kept in the bucket and additional aliquots were added and combined to form a composite sample. The exception was the discrete sample collected from pond grid 26, which was collected during a separate event than the associated pond composite sample (Pond Composite B). For each composite sample, the following containers were filled for laboratory analysis:

- **(1) 2 oz jar**
- **(4) 4-oz jars**
- **(3) 8-oz jars**

For Chem Mill process sludge and evaporation pond sediment sampling events, clean laboratory-supplied sample containers were filled after the composite sample had been mixed. All containers were properly labeled with the sample identification, date and time of collection, and analysis required. The samples were securely wrapped to prevent breakage. Samples were then immediately placed in coolers on ice. Detailed documentation of the sampling event was recorded and a chain of custody (COC) was completed. COCs included sample IDs, date and time of collection, sampler initials, and parameters for analyses. The sampler signed the chain of custody to relinquish custody with the date and time of transfer. The chain of custody was placed in a heavy-duty locking plastic bag and placed in the cooler. The coolers were sealed with packing tape and the FedEx label was adhered to the tops of the coolers. Some samples were hand delivered to Specialty in Clackamas, Oregon. The remaining samples were delivered to the FedEx facility in West Linn, Oregon and then shipped to ESC in Mt Juliet Tennessee for next day delivery.

d. Describe the sampling devices used for sample collection and the basis for selecting the devices.

For Chem Mill process sludge, sample aliquots were collected with a 2-inch stainless steel hand bucket auger. This equipment was determined to be best suited for roll-off bin sampling based on guidance from the RCRA Waste Sampling Draft Technical Guidance (USEPA 2002. pgs. 99, 112, and 225). The hand bucket auger effectively collected the moist clayey sample at the specified depth and held the sample until it was removed from the roll-off and transferred to the mixing equipment.

For the evaporation pond sediment sampling, samples were collected using a 48-inch stainless steel hand-core sediment sampler (penetrating probe sampler) with disposal eggshell catchers and plastic liners. The hand-core sediment sampler is a push coring

device consisting of a threaded steel tube, a threaded top cap, and a detachable steel tip. The steel tube was approximately 2 inches in diameter. A stainless steel extension rod was used in some locations where the water was too deep to collect a full sediment core sample using the sampler alone. The equipment was determined to be best suited for waste settling pond sampling based on the RCRA Waste Sampling Draft Technical Guidance (USEPA 2002, pgs 113, 118, 215, and 288).

e. Identify and discuss any deviations from your original sampling plan and strategy and the impact of these deviations on waste characterization.

There were no deviations from either SAP with regard to the constituents identified to undergo laboratory analytical testing for quantitative analysis.

A list describing field modifications to sampling methodologies related to filter press cake sampling is shown below:

1. **The SAP specified toxicity leachate characteristic procedure (TCLP) analysis would be performed on composite samples collected during subsequent sampling events after a constituent of concern (COC) had been identified (SLR 2018a, pg. 7). The plan was changed and TCLP analysis for COCs was performed on the same samples as those with a total COC concentration greater than 20 times the TLCP benchmark concentrations using contingency containers collected from the same composite.**
2. **Aliquots combined for composite samples were mixed in a decontaminated 5-gallon HDPE bucket instead of a stainless steel bowl (SLR 2018a, pg. 11). This was because the stainless steel bowl originally specified for mixing did not provide enough volume for effectively mixing the aliquots into a homogeneous composite.**
3. **It was determined that wiping down all solids from the bucket auger in-between aliquot collection from the same sampling event was unnecessary.**

A list describing field modifications to sampling methodologies related to evaporation pond sediment sampling is shown below:

1. **The SAP specified that all pond composite and pond grid samples would be collected during a single event (SLR 2018b, pg. 4). Pond Composite B was collected during a preliminary sampling event to confirm the effectiveness of the hand core sediment sampler.**
2. **Samples were tested on a standard turnaround instead of 5-day rush (SLR 2018b, pg. 4). Follow-up TCLP analytical testing could be specified and performed within hold times using standard turnarounds on total analysis.**
3. **Discrete and composite aliquot samples were collected from as close to the center as possible. As a result of the liquid level in the pond during the time of sampling, all discrete and composite aliquot samples were collected from submerged locations.**
4. **Submerged samples were collected using a decontaminated 48" stainless steel hand push-core sediment sampler with a stainless steel extension rod, disposable**

eggshell catchers, and disposable liners. The SAP had specified a settleable solids profiler would be used, but field testing revealed this equipment was unsuitable for collecting a full sediment sample (SLR 2018b, pg. 11). SLR notified DEQ of the change via email on April 4, 2018.

5. **Triple rinse decontamination of the sediment sampler between samples was determined to be unnecessary because composite and discrete samples were collected to represent the chemical composition of the entire pond. Solids were removed from the equipment between aliquot and discrete sample collection.**
6. **Separate decontaminated buckets were used during sampling events to composite aliquots, rather than rinsing a single bucket between mixing (SLR 2018b, pg. 11). This allowed for samples to be collected and composited more efficiently.**

f. Explain why you believe the samples collected are non-biased and sufficiently represent the petitioned waste. In this explanation, fully address the potential for waste uniformity or spatial and temporal variability and how the strategy ensured collection of representative samples.

Chem Mill process sludge is generated on a continuous basis 24-hours per day, 7 days per week. There are no operational changes that occur in the treatment process. The sludge is stored in a tank and fed to a filter press where water is removed from the sludge. The resultant filter cake is collected in a 20-cubic yard roll-off. One roll-off is filled approximately every ten days. The manner in which the filter cake is generated indicates that the filter cake is generally homogeneous. Historical analytical data provided in the SAP submitted to DEQ supports this claim. A random unbiased sampling strategy is expected to have captured any unexpected spatial variability.

Evaporation pond sediment has been deposited on the pond since the pond was constructed in approximately 1975. The evaporation pond sediment is not expected to have significant temporal variability because records indicate it has been consistently well-mixed, and the sediment is a cumulative result of decades of solids settling from plant liquids held in the pond. In addition, the facility no longer routinely sends process liquids to the pond. Vertical spatial variability was represented in the samples by collecting a full sediment core from the sediment-liquid interface to the sediment-native soil interface. A random unbiased sampling strategy is expected to have captured any unexpected spatial variability.

SAMPLE SPECIFICINFORMATION

4. How many samples of the petitioned waste were collected? Is the number of samples taken different from the number of samples agreed upon during the pre-petition scoping meeting? Explain the deviation.

The number of samples taken did not deviate from the sampling and analysis plan developed by SLR with collaboration from DEQ. However, Period 1 and Period 2 composite samples from the filter press cake were submitted to Specialty for duplicate analysis of total COPC concentrations.

For Chem Mill process sludge, four composite samples were collected. Each consisted of five aliquots from the same waste bin, with the locations of aliquots within the bin being selected randomly from the grid formation. Overall, a sample was collected approximately once every ten days from a unique waste bin. COPCs were select metals, cyanide and fluoride.

For the evaporation pond sediment, four composite samples were collected. Each consisted of three aliquots that were randomly selected from a two-dimensional grid. A discrete sample was collected from the third aliquot location of every composite sample. Overall, there were two sampling event with a total of four composite and four discrete samples. COPCs were metals, VOCs, SVOCs and PBCs.

5. For each individual sample collected, please provide the following sample-specific information (items 5a through 5g).

   a. For each sample included in item 4, provide the sample identification number (as it appears in your field logbook and other records), the date that the sample was taken, an indication as to what type of sample it is (waste sample versus quality control sample and whether or not it is a composite sample).

      Chem Mill process sludge sampling events were conducted on March 22, 2018, April 2nd, 2018, April 12nd, 2018, and April 22nd, 2018. Table 4A presents a summary of sample identifications, along with the dates samples were collected and whether they were discrete or composite samples.

      Evaporation pond sediment sampling was conducted during two separate events on April 12, 2018 and April 18, 2018. Table 4B presents a summary of sample identifications, along with the dates samples were collected and whether they were discrete or composite samples.

   b. Describe how each sample was collected, and its point of collection from the petitioned waste. If a sample is a composite of grabs, provide the number of grab samples collected for the composite sample, the sampling location for each grab sample, the volume of each grab sample, and the volume of the composite sample.

      This is described in item c on Page 32, above. It is not repeated here to avoid duplication. See "Sampling Strategy, Part 3, Letter c, beginning on Page 35.

   c. Describe the general sampling location (e.g., which quadrant of a surface impoundment) and the specific sampling points (e.g., specific location in the quadrant). You may refer to numbered sampling points shown in a diagram.

      This is described in item c on Page 32, above. It is not repeated here to avoid duplication. See "Sampling Strategy, Part 3, Letter c, beginning on Page 35.

Appendix B includes additional information on sampling locations for each waste.

d. Describe how each sample was composited (e.g., equipment used and manner of mixing).

The same technique was used to composite the samples for both Chem Mill process sludge and Evaporation pond sediment. Samples were placed in a clean 5-gallon HDPE bucket, and then mixed together with a stainless steel spoon continuously for at least 5 minutes until a composite sample was formed. For the Chem mill process sludge, four samples were placed and mixed in the bucket, whereas for the Evaporation pond sediment, only three aliquot samples were mixed together.

e. Provide a physical description of each sample at time of collection (e.g., color, odor, whether phase separation occurred soon after collection).

The filter press cake was fairly uniform in color and texture throughout each individual sampling event and across the four events. The filter press cake was grayish-green in color and resembled a clayey soil. The filter press cake did not have a distinct odor.

The evaporation pond sediment was fairly consistent in appearance, color, odor and characteristics across the aliquot locations but stratified across the core depths. A typical core consisted of native brown clay at the bottom followed by a 1 to 2 ft thick grayish-white silty sediment layer with a band of green near the center of the column. The cores had a slight organic odor presumably due to anaerobic conditions. The core quickly lost its shape as it was deposited in the bucket for sample collection and compositing. After compositing the aliquots, the material resembled a gray slurry that was homogeneous.

f. For each composite sample, specify the time and date when the grab samples were collected and the time and date when the sample was composited, as applicable.

The time that each aliquot sample was collected was not recorded. The time and date recorded for each sample is included in laboratory analytical reports (see Appendices D through H.

g. Describe the handling and preparation techniques used for each sample (including types of containers used and techniques employed for container preparation) and types and amounts of preservatives used.

For Chem Mill process sludge, after collection, samples were placed immediately into clean, laboratory-supplied jars, sealed, labeled, and placed on ice for delivery to the analytical laboratory under strict chain-of-custody procedures. Clean nitrile sampling gloves were worn during sampling handling procedures. The mixing bucket, spoon, and bucket auger were decontaminated prior to and between each

sample event using a solution of Alconox detergent and distilled water, followed by a triple rinse with distilled water.

Three different sized glass jars were used for the total concentration tests. A 2-oz glass jar was used for the total metals analysis except total Zirconium, which was performed from material in a 4-oz glass jar. An 8-oz glass jar was used for the total fluoride, hexavalent chromium, and cyanide. Follow-up TCLP analysis was performed using a second 8-oz glass jar. These jars did not contain preservatives.

For Evaporation pond sediment, after collection, samples were placed immediately into clean, laboratory-supplied jars, sealed, labeled, and placed on ice for delivery to the analytical laboratory under strict chain-of-custody procedures. Clean nitrile or PVC sampling gloves were worn during sampling handling procedures. The mixing bucket and hand-core sediment sampler were decontaminated prior to each sampling event using a solution of Alconox detergent and distilled water, followed by a triple rinse with distilled water. The eggshell catcher and plastic liners were provided new. A single eggshell catcher and plastic liner were used to collect all aliquots during each sampling event. Between sampling events, the eggshell catchers and liners were replaced with new equipment.

Three different-sized glass containers were used for the total concentration tests on the composite samples. A 2-oz glass jar was used for total metals analysis. Three 4-oz glass jars were used to test for total zirconium, PCBs, and SVOCs. An 8-oz glass jar was used for total fluoride, hexavalent chromium, and cyanide analysis. Follow-up TCLP testing for SVOCs, PBCs, metals, fluoride, hexavalent chromium, and cyanide was performed using material placed in two 8-oz jars.

For the VOC discrete samples, a 5035 terracore kit was used for analysis. The kit included three 40-mL vials with sodium bisulfate preservative, one 40-mL vial with methanol preservative, one 2-oz jar for dry with total solids and one T-handle for solids transfer. An 8-oz glass jar was used for the four TCLP tests. Follow-up TCLP analysis on the discrete samples was performed using material placed in an 8-oz glass jar.

Additional information describing the preservatives and containers used can be found in lab reports, located in Appendices D through H.

OTHER GENERAL INFORMATION

6. Describe the weather conditions during sampling (if conducted outdoors).

Sampling activities occurred between 9:00 AM and 4 PM. Weather was sunny or cloudy with light rain only during the period 1 filter press cake sample. Temperatures were approximately between 50˚F and 70˚F.

7. Describe any facility activities separate from sampling that occurred at the same time and

might have affected sample representativeness.

Activities at the facility were typical of normal operation from the start of sampling periods to the conclusion of sampling. The exception was during Period 3 filter cake press generation, when a portion of the material processed in the Chem Mill was Alloy C. The resulting liquids were sent to the ZLD liquid recycling system and eventually processed by the filter press.

8. Describe sampling device decontamination; and note when disposable devices were used for sample collection.

Three pieces of equipment were used for the filter press cake sampling activities including a stainless steel hand auger with 5-ft extension rods, a stainless steel spoon, and a 5-gallon HDPE bucket. Prior to sampling, each piece of equipment was decontaminated using Alconox and a triple wash of distilled water.

The equipment used during the evaporation pond sediment sampling included a 48-inch stainless steel hand core sediment sampler with a 5-ft extension, disposable plastic eggshell catchers, disposable plastic liners, a stainless steel spoon, and 5-gallon HDPE buckets. Prior to each sampling event, the equipment was decontaminated using Alconox and a triple wash of distilled water. New eggshell catchers and liners were used at the beginning of each sampling event, but they were reused to sample different aliquot locations across the same event.

9. Were the chain-of-custody procedures specified in SW-846 followed?

Yes. Field modifications to the SAPs are described above in Part 5, Section 3e. [Skip to item 11]

10. Provide a description of the quality control procedures and documentation system used to track sample location and maintain sample integrity during transportation to the laboratory. Copies of the chain-of-custody forms may be provided, but are not needed.

Not Applicable.

LOCALIZED AREA OF CONTAMINATION

11. Have you collected samples to characterize a localized area of contamination (a "hot spot") within the petitioned waste?

No [Skip to item 16]

12. Discuss your basis for believing a hot spot may or does exist (e.g., records of a one-time discharge of a concentrated material at a specific location).

Not Applicable.

13. Describe the known or predicted location (on a diagram) and the dimensions (e.g., depth, width and length) of the hot spot.

Not Applicable.

14. Identify the samples specifically collected to characterize the hot spot.

Not Applicable.

15. Explain why the samples sufficiently represent the hot spot.

Not Applicable.

MULTIPLE WASTE TREATMENT FACILITY

16. Have you collected samples to characterize a waste generated by a multiple waste treatment facility (MWTF)?

No [Skip to item 21]

17. List and describe the untreated wastes that were treated and are represented by the treatment residue samples collected during the sampling period.

Not Applicable.

18. Provide the percentage of total wastes treated annually that was represented by the sampling period.

Not Applicable.

19. List and briefly describe the untreated wastes that also are treated at the facility but were not represented by the sampling period.

Not Applicable.

20. Explain why the wastes not represented by the sampling period are not expected to contain any other hazardous constituents of concern, different levels of constituents of concern, or other different characteristics than that represented by the sampling period.

Not Applicable.

WASTE ANALYSIS INFORMATION

21. Were sample analyses done by in-house staff?

No [Answer items 21a and 21b]

a. Name and address of the organization(s) or company(s) responsible for sample analyses.

ESC Lab Sciences (ESC)
12065 Lebanon Road
Mount Juliet, Tennessee
615-773-9772

Specialty Analytical (Specialty)
9011 SE Jansen Road
Clackamas, Oregon, 97015
503-607-1331

b. For each individual person (in-house and otherwise) who conducted analyses or was responsible for data reduction, validation, and laboratory quality control, please provide a resume of qualifications and the following information:

Resumes of qualifications for individuals who conducted analyses or other related activities are included in Appendix C.

22. Provide your signed laboratory data reporting forms from all analyses, including results from quality control analyses.

Laboratory reporting forms are included in Appendices D through H.

23. Provide the following information on each sample and each analysis.
    a. Sample identification numbers as logged during collection and as assigned by the laboratory.
    b. Type of sample (<u>e.g.</u>, waste sample, waste sample replicate, equipment blank, field blank).
    c. Date of sample receipt by the laboratory.
    d. The sample workup or preparation method and reference for the method (<u>e.g.</u>, SW-846 Method 3500).
    e. The date of sample workup or preparation.
    f. The name of the person conducting the analysis.
    g. The date of extraction and analysis.
    h. The test method used and the source of the test method (<u>e.g.</u>, SW-846 Method 8020).
    i. The specific constituent, parameter, or hazard for which analysis was conducted.
    j. The test results, expressed in appropriate units (<u>e.g.</u>, mg/L, mg/kg).
    k. The basis for the analysis (<u>e.g.</u>, wet/dry weight).

l. The quantitation limits.

The laboratory analytical reports contain the following information for each sample and analysis (see Appendices D through H).

24. Provide the names and model numbers of all equipment used during analysis.

This information is found in the and laboratory testing information and analytical reports (see Appendices C through H)

25. Provide all other information necessary to fully interpret the test procedures or results.

All necessary information to fully interpret the test procedures and results is provided in the petition and lab reports.

26. For each quality control analysis that involved a matrix or a surrogate spike and spike duplicate analysis, provide the following information.

The following information is provided on the laboratory analytical reports (see Appendices D through H).

a. The name of the spike analyte added.
b. The concentration of the spike analyte in the unspiked sample.
c. The amount of the spike analyte added.
d. The measured amount of the spike in both spiked samples.
e. The calculated percent recovery of the spike and method of calculation.
f. The acceptance criterion for recovery of each matrix spike.
g. The relative percent difference (RPD) between the duplicate results.
h. The acceptance criterion for the RPD.

27. Identify whether the waste analytical data was corrected based on quality control results (e.g., blank analysis) and explain how the correction was made.

The waste analytical data was not corrected based on quality control results (see Appendices D through H).

28. Explain any inconsistencies or deviations found in the reported analytical results. The discussion should include any observed analytical interferences and what actions were taken to resolve the problems.

No inconsistencies or deviations were reported (see Appendices D through H).

29. If any calculations are necessary, (i.e., in use of the Oily Waste Extraction Procedure, for the Mobile Metal Concentration) please include all calculation sheets.

All concentrations were reported without the use of calculations.

PART 6: DELISTING GROUNDWATER MONITORING INFORMATION

1. Show which of the following describes the management of the petitioned waste.

    a. The petitioned waste is currently managed in a land-based waste management unit (on-site or off- site), and groundwater monitoring is needed under 40 CFR Part 264 or 265 or authorized State equivalent, or other Federal, state, or local requirements; or if groundwater monitoring information is otherwise available for the unit.

    The filter press cake is shipped to Chemical Waste Management Facility in Arlington, Oregon for disposal in a landfill permitted by the state of Oregon RCRA program. This landfill is subject to RCRA groundwater monitoring requirements under this permit. The analytical results from sampling also indicate that the filter press cake is not reasonably expected to have negatively impacted groundwater at either landfill.

    b. The petitioned waste was once managed (but is no longer) in a land-based waste management unit (on-site or off-site) and groundwater monitoring was needed under 40 CFR Part 264 or 265 or authorized State equivalent, or other Federal, state, or local requirements; or if groundwater monitoring information is otherwise available for the unit.

    Not Applicable.

    c. The petitioned waste is currently managed, or was once managed, in a land- based waste management unit, but groundwater monitoring requirement has been waived.

    Not Applicable.

    d. The petitioned waste is currently managed, or was once managed, in one or more land-based waste management units containing also significant amounts of other wastes, and you consider groundwater data from these non-dedicated units are immaterial in evaluating the petitioned waste's impact on groundwater quality.

    The filter press cake has not previously been disposed of as a listed waste.

    e. None of the above management scenarios apply.

    Not Applicable.

2. Has the appropriate responsible party previously submitted groundwater monitoring information for the subject units to an EPA Regional office or an authorized State in response to 40 CFR Part 264 or Part 265 requirements (or authorized State equivalent)?

Not Applicable

3. Do you wish that the DEQ directly get the groundwater monitoring information from the EPA Region or State?

   Not Applicable

4. Indicate the EPA Regional or State Contact for getting the groundwater monitoring information (include name of contact, affiliation, mailing address, and phone number).

   a. Name of contact: **Seth Sadofsky, PhD, RG**
   b. Affiliation: **Materials Management, Western Region, Oregon DEQ**
   c. Title of report (if applicable): **NA**
   d. Street/P.O. Box: **165 East 7th Avenue, Suite 100**
   e. City: **Euguene** State: **Oregon** Zip Code: **97401**
   f. Phone: **(541) 687-7329**

5. Provide all available and relevant (e.g. for each unit used to manage the petitioned waste) groundwater monitoring information and reports which, at a minimum, should include:

   a. A description of site geology and hydrogeology.
   b. A description of the groundwater monitoring systems for the units in which the petitioned waste is (or was) managed.
   c. The results obtained from the analysis of groundwater samples.
   d. A discussion of sampling and analytical procedures followed in getting and analyzing the groundwater samples.
   e. Any additional information necessary to characterize the petitioned waste's impact on groundwater quality.
   f. An analysis and discussion of whether the above-listed information and data that show contamination of the groundwater is attributable to the petitioned waste.

   Not Applicable.

6. Is the unsaturated (vadose) zone monitored at any of the subject units?

   Not Applicable [Skip to Item 8]

7. Provide the following information on vadose zone monitoring (e.g. lysimetric information) in as much detail as possible (as requested for groundwater monitoring systems).

   a. A description of regional, local, and unit-specific geology and hydrogeology, and soil characteristics.
   b. A description of the monitoring system(s) (e.g. design and construction)
   c. A description of the sampling and analytical procedures followed.
   d. Analytical and QC data obtained from sample analysis.

e. An interpretation of the information and data presented.

Not Applicable.

8. Discuss whether groundwater contamination exists on the site and, if it does, identify the source. If the source is not the petitioned waste, explain, with supporting information, why the petitioned waste has not contributed to the contamination.

   Based upon the analytical results presented in this petition, the filter press cake and evaporation pond sediment are not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment.

9. Provide documentation on the waiver or exemption of groundwater monitoring at the land-based management unit containing the petitioned waste.

   Not Applicable.

10. Identify the units in question, provide estimates of the relative volumes of the petitioned and other wastes disposed in the unit, and discuss in detail why you consider groundwater data from these non-dedicated units are immaterial in evaluating the petitioned waste's impact on groundwater quality.

    Based upon the analytical results presented in this petition, the filter press cake and evaporation pond sediment are not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment.

11. Describe why groundwater monitoring is not needed for your petitioned waste.

    Based upon the analytical results presented in this petition, the filter press cake and evaporation pond sediment are not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment.

REFERENCES

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United States Environmental Protection Agency (USEPA). 2010A. Delisting Risk Assessment Software (DRAS), Version 3.0. USEPA Region 5, Web Reference: https://www.epa.gov/hw/hazardous-waste-delisting-risk-assessment-software-dras

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USEPA, 1996. Method 5035, Revision 0, December 1996, Final Update III to the Third Edition of the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846. Web Reference: https://www.epa.gov/sites/production/files/2015-12/documents/5035.pdf

USEPA. 1993. Petitions to Delist Hazardous Wastes – A Guidance Manual, Second Edition. Science Applications International Corporation, Web Reference: https://nepis.epa.gov/Exe/ZyNET.exe/200125QL.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C00000017%5C200125QL.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

USEPA. 1992. Method 1311 – Toxicity Characteristic Leaching Procedure. Web Reference: https://www.epa.gov/sites/production/files/2015-12/documents/1311.pdf

TABLES

TABLE 1
SUMMARY OF STATE AND FEDERAL PERMITS FOR SELMET, INC.
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Program	Permit No.	State or Federal Issued	Status
Standard Air Contamination Discharge Permit	22-8041-ST-01	State	Active
National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit	1200-Z	State	Active
Water Pollution Control Facility (WPCF) Permit	101350	State	Active
Water Pollution Control Facility (WPCF) Septic Permit	103129	State	Active
Public Water System	OR4194327	State	Active

Table 2A
Historical ZLD System Filter Press Cake Analytical Results
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Sample Name	Sample ID	Sample Date	Total Solids	Arsenic, TCLP	Barium, TCLP	Cadmium, TCLP	Chromium, TCLP	Lead, TCLP	Mercury, TCLP	Nickel, TCLP	Selenium, TCLP	Silver, TCLP
Units			%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TCLP Regulatory Limit			NA	5.0	100.0	1.0	5.0	5.0	0.2	--	1.0	5.0
2014 Filter Press Sampling												
Week 1	**1312086-001**	--[1]	--	<0.10	0.2045	<0.005	0.1530	0.113	--	1.218	<0.10	<0.05000
Week 2	**1312086-002**	--[1]	--	<0.10	0.277	<0.005	0.5915	<0.10	--	1.275	<0.10	<0.05000
Week 1 Filter Cake	**1401171-001**	1/24/2014	--	<0.10	0.1965	<0.005	0.1080	<0.10	--	0.0305	<0.10	<0.05000
Week 2 Filter Cake	**1401197-001**	1/27/2014	--	<0.10	0.167	<0.005	0.08200	<0.10	--	0.0485	<0.10	<0.05000
Filter Cake Sample #3	**1402066-001**	2/10/2014	--	<0.10	0.195	<0.005	0.04050	<0.10	--	0.3855	<0.10	<0.05000
Filter Cake Sample #4	**1402177-001**	2/18/2014	--	<0.02	0.025	0.0245	0.01010	<0.02	--	0.008	<0.02	<0.05000
Filter Cake WK 6	**1403050-001**	3/5/2014	--	<0.10	0.179	<0.005	0.4085	<0.10	--	0.324	<0.10	<0.05000
Filter Cake WK 7	**1403086-001**	3/7/2014	--	<0.10	0.0975	0.0115	0.1525	<0.10	--	0.131	<0.10	<0.05000
Filter Cake Week 8	**1403100-001**	3/11/2014	--	<0.10	0.068	0.007	0.1635	<0.10	--	0.1555	<0.10	<0.05000
Filter Cake Week 9	**1403127-001**	3/13/2014	--	<0.10	0.067	<0.005	0.08900	<0.10	--	0.0995	<0.10	<0.05000
Filter Cake Week 10	**1403145-001**	3/14/2014	--	<0.10	0.067	<0.005	0.07350	<0.10	--	0.058	<0.10	<0.05000
Standard Deviation [2]			--	0.012	0.079	0.007	0.175	0.023	--	0.464	0.012	0.000
Mean [2]			--	0.046	0.140	0.006	0.170	0.052	--	0.339	0.046	0.025

Notes:

[1] No date specified for these samples.

[2] For concentrations below the laboratory method reporting limit (MRL), half of the detection limit was used.

Grey text indicates concentrations below the MRL.

Table 2A (cont.)
Historical ZLD System Filter Press Cake Analytical Results
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Sample Name	**Units**	**WW FP 08012017**
Sample ID		**1708015-002**
Sample Date		**8/1/2017**
Total Solids	%	37.5%
Arsenic, TCLP	mg/L	<0.00500
Barium, TCLP	mg/L	<0.0500
Cadmium, TCLP	mg/L	<0.00500
Chromium, TCLP	mg/L	<0.00500
Lead, TCLP	mg/L	<0.00500
Mercury, TCLP	mg/L	<0.000500
Selenium, TCLP	mg/L	<0.0500
Silver, TCLP	mg/L	<0.00500
Chloride	mg/kg	133
Fluoride	mg/kg	96
Nitrate	mg/kg	109
Sulfate	mg/kg	666
Aluminum, Total	mg/kg	43,300
Arsenic, Total	mg/kg	<0.971
Barium, Total	mg/kg	2.68
Cadmium, Total	mg/kg	<0.0971
Calcium, Total	mg/kg	78,700
Chromium, Total	mg/kg	6.3
Iron, Total	mg/kg	396
Lead, Total	mg/kg	0.691
Magnesium, Total	mg/kg	1,400
Manganese, Total	mg/kg	17.9
Mercury, Total	mg/kg	<0.0166
Molybdenum, Total	mg/kg	15.9
Nickel, Total	mg/kg	5.87
Potassium, Total	mg/kg	252
Selenium, Total	mg/kg	<0.971
Silicon, Total	mg/kg	1,240
Silver, Total	mg/kg	11
Sodium, Total	mg/kg	1,030
Tin, Total	mg/kg	139
Titanium, Total	mg/kg	27,900
Vanadium, Total	mg/kg	1,120
Zirconium, Total	mg/kg	329

Notes:

Grey text indicates concentrations below the method reporting limit (MRL).

Table 2B
Historical Evaporation Pond Sediment Analytical Results
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Sample ID	Units	13M	13P	14M	14P	NPond071001	MPond071001	SPond071001	DuplicateSPond	POND082702	PB-1	PB-2	PB-3	PB-4	PB-5	PB-6
Report		Final Conceptual Human Health Risk Assessment Model ^{2}				Report on Sediment and Water Sampling In Evaporation Pond				Report on Phase II Sediment Sampling in Evaporation Pond	Pond and Ditch Assessment Report					
Sample Type		Solid Grab	Solid Grab	Solid Composite	Solid Composite	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment	Pond Sediment
Sample Date		6/25/1990	6/26/1990	6/26/1990	6/26/1990	7/10/2001	7/10/2001	7/10/2001	7/10/2001	8/27/2002	8/23/2011	8/23/2011	8/23/2011	8/23/2011	8/23/2011	8/23/2011
Sample Depth (ft bws^1)		Unknown	Unknown	Unknown	Unknown	7	10	7.25	7.25	7	<6	<6	<6	<6	<6	<6
HVOCs																
1,1,1-Trichloroethane	µg/kg	<1.0	<1.0	<1.0	<1.0	<230	<322	<277	<220	--	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	µg/kg	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/kg	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	µg/kg	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Chloroethane	µg/kg	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10
cis-1,2-Dichloroethene	µg/kg	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Dichlorodifluoromethane	µg/kg	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Tetrachloroethene	µg/kg	<1.0	<1.0	<1.0	<1.0	<230	<322	<277	<220	--	<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethene	µg/kg	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Trichloroethene	µg/kg	<1.0	<1.0	<1.0	<1.0	<230	<322	<277	<220	--	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/kg	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Toluene	µg/kg	--	--	--	--	<230	360	<277	<220	--	--	--	--	--	--	--
Vinyl Chloride	µg/kg	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10
Metals, TCLP																
Arsenic, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	<0.100	<0.100	--	--	--
Barium, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	<0.0500	<0.0500	--	--	--
Cadmium, TCLP	mg/L	--	--	--	--	--	--	--	--	<0.01	--	<0.00500	<0.00500	--	--	--
Chromium, TCLP	mg/L	--	--	--	--	--	--	--	--	<0.01	--	<0.0250	<0.0250	--	--	--
Fluoride, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, TCLP	mg/L	--	--	--	--	--	--	--	--	<0.05	--	<0.100	<0.100	--	--	--
Nickel, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	<0.100	<0.100	--	--	--
Silver, TCLP	mg/L	--	--	--	--	--	--	--	--	<0.02	--	<0.0500	<0.0500	--	--	--
Vanadium, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	0.0790	<0.0500	--	--	--
Zinc, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury, TCLP	mg/L	--	--	--	--	--	--	--	--	--	--	<0.000100	<0.000100	--	--	--
Metals, Total																
Aluminum	mg/kg	62,000	--	21,600	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/kg	11	--	5.6	--	3.28	6.80	6.19	5.25	--	--	--	--	--	--	--
Barium	mg/kg	108	--	177	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	mg/kg	2	--	1.2	--	<1.15	2.25	<1.38	<0.967	9.1	--	--	--	--	--	--
Chromium	mg/kg	34.8	--	26.9	--	68.5	126	93.1	78	--	--	--	--	--	--	--
Fluoride	mg/kg	--	--	--	--	460	780	678	500	--	--	--	--	--	--	--
Lead	mg/kg	<8.0	--	<7.8	--	<23.0	<32.2	<27.7	<19.3	<20	--	--	--	--	--	--
Mercury	mg/kg	<0.1	--	<0.09	--	<0.0826	<0.0721	<0.0692	<0.0626	--	--	--	--	--	--	--
Molybdenum	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/kg	--	--	--	--	52.2	73.3	46.6	37.6	--	--	--	--	--	--	--
Selenium	mg/kg	<6.8	--	<6.6	--	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/kg	44.6	--	34	--	129	425	331	130	--	--	--	--	--	--	--
Titanium	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/kg	--	--	--	--	154	766	540	365	--	--	--	--	--	--	--
Zinc	mg/kg	--	--	--	--	56.6	118	116	93.4	--	--	--	--	--	--	--
Zirconium	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

[1] Below water surface.

[2] Data is referenced from a previous report which could not be located.

-- Constituent not tested for in sample.

Grey text indicates concentrations below the laboratory method reporting limit (MRL).

TABLE 3A
CONSTITUENTS OF POTENTIAL CONCERN (COPCs) FOR CHEM MILL PROCESS SLUDGE
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Analyte Group	Individual Analytes
Metals Method 6010B	Cadmium
	Manganese
	Molybdenum
	Nickel
	Silver
	Vanadium
	Zirconium
Anions Methods 6010B, 9012, 9056A	Chromium
	Cyanide
	Fluoride
Metal Ion Method 7199	Chromium (vi) (+6)

TABLE 3B
CONSTITUENTS OF POTENTIAL CONCERN (COPCs) FOR EVAPORATION POND SEDIMENT
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Analyte Group	Individual Analytes
Anions Methods 9056A, 9012	Fluoride
	Cyanide
Metals Methods 6010B, 7471A	Antimony
	Arsenic
	Barium
	Beryllium
	Cadmium
	Chromium
	Cobalt
	Copper
	Lead
	Manganese
	Mercury
	Molybdenum
	Nickel
	Selenium
	Silver
	Thallium
	Vanadium
	Zinc
	Zirconium
Polychlorinated Biphenyls Method 8082	Polychlorinated biphenyls
Metal Ion Method 7199	Chromium (vi) (+6)
Semi-Volatile Organic Compounds Method 8270	1,2,4-trichlorobenzene
	2,4,6-Trichlorophenol
	2,4-Dichlorophenol
	2,4-Dimethylphenol
	2,4-Dinitrophenol
	2,4-Dinitrotoluene
	2,6-Dinitrotoluene
	2-Chlorophenol
	3,3-Dichlorobenzidine
	4,6-Dinitro-o-cresol
	Acenaphthene
	Anthracene
	Benzidine
	Benzo[a]anthracene; benzanthracene
	Benzo[a]pyrene
	Benzo[b]fluoranthene
	Benzo[k]fluoranthene
	Beta-chloronaphthalene
	Bis(2-chloroisopropyl)ether
	Butyl benzyl phthalate; benzyl butyl phthalate
	Chrysene
	Dibenz[a,h]anthracene
	Dichloroethyl ether
	Dichloromethoxy ethane
	Diethyl phthalate
	Dimethyl phthalate
	Di-n-butyl phthalate
	Fluoranthene
	Fluorene
	Hexachlorobenzene
	Hexachlorobutadiene
	Hexachloroethane
	Indeno(1,2,3-cd)pyrene
	Isophorone
	Naphthalene
	Nitrobenzene
	N-nitrosodimethylamine
	N-nitrosodiphenylamine
	N-nitrosodipropylamine;di-n-propylnitrosamine
	Pentachlorophenol
	Phenol
	Pyrene

TABLE 3B
CONSTITUENTS OF POTENTIAL CONCERN (COPCs) FOR EVAPORATION POND SEDIMENT
F006 DELISTING PETITION
SELMET INC.
ALBANY, OREGON

Analyte Group	Individual Analytes
Volatile Organic Compounds Methods 8260B, 8270	1,1,1,2-Tetrachloroethane
	1,1,2,2-Tetrachloroethane
	1,1,2-Trichloroethane
	1,1-Dichloroethane
	1,1-Dichloroethylene; Vinylidene chloride
	1,2,3-Trichloropropane
	1,2,4-Trichlorobenzene
	1,2-Dibromo-3-chloropropane; dbcp
	1,2-Dibromoethane; ethylene dibromide
	1,2-Dichloroethane; ethylene dichloride
	1,2-Dichloropropane
	4-Methyl-2-pentanone; methyl isobutyl ketone
	Acetone
	Acrylonitrile
	Benzene
	Bromodichloromethane
	Bromoform; tribromomethane
	Carbon tetrachloride
	Chlorobenzene
	Chloroethane; ethyl chloride
	Chloroform
	Cis-1,3-dichloropropene
	Cumene (isopropylbenzene)
	Dibromochloromethane; chlorodibromomethane
	Dichlorodifluoromethane
	Dichloroethylene cis-1,2-
	Ethylbenzene
	Hexachlorobutadiene
	Methyl bromide; bromomethane
	Methyl chloride; chloromethane
	Methyl chloroform; 1,1,1-trichloroethane
	Methyl ethyl ketone; mek; 2-butanone
	Methylene bromide; dibromomethane
	Methylene chloride; dichloromethane
	Naphthalene
	O-dichlorobenzene
	P-dichlorobenzene
	Styrene
	Tetrachloroethylene; perchloroethylene; tetrachloroethene
	Toluene
	Trans-1,2-dichloroethylene
	Trans-1,3-dichloropropene
	Trichloro-1,2,2-trifluoro-ethane 1,1,2-
	Trichloroethylene; trichloroethene
	Trichlorofluoromethane
	Vinyl chloride
	Xylene (total)

TABLE 4A
CHEM MILL PROCESS SLUDGE SAMPLING LABORATORY ANALYTICAL RESULTS
F006 DELISTING PETITION
SELMET INC.
SALEM, OREGON

Analyte Group	Individual Analytes	DRAS Maximum Allowable TCLP Concentration (mg/L)[4]	DRAS Maximum Allowable Total Concentration (mg/kg)[4]	TCLP RCRA Toxicity Characteristic Regulatory Levels (mg/L)	Oregon RBC - Direct Contact to Construction Worker (mg/kg)	Oregon RBC - Direct Contact to Occupational Worker (mg/kg)	3/22/2018			4/2/2018			4/12/2018		4/20/2018	
							Period 1			Period 2			Period 3		Period 4	
							Composite Sample			Composite Sample			Composite Sample		Composite Sample	
							Total (mg/kg)[1]	Total (mg/kg)[3]	TCLP (mg/L) [2]	Total (mg/kg)[1]	Total (mg/kg)[3]	TCLP (mg/L) [2]	Total (mg/kg)[1]	TCLP (mg/L) [2]	Total (mg/kg)[1]	TCLP (mg/L) [2]
Metals Method 6010B	Cadmium	0.22	20,000	1.0	350	1,100	<3.38	0.34	-	<12.0	0.40	<0.00500	<11	<0.00500	<5.94	<0.00500
	Manganese	38.70	1,540,000	--	8,200	25,000	29	70.60	-	53.80	63.90	-	71.90	-	74.30	-
	Molybdenum	7.92	83,100,000	--	--	--	141	345	0.187	316	345	0.0254	236	0.1	319	0.0640
	Nickel	32.70	258,000	--	7,000	22,000	25.10	50.2	-	62.80	57.10	-	57.10	-	51.90	-
	Silver	20.70	2,060,000	5.0	1,800	5,800	<6.77	41.70	-	<24.0	34.50	-	<22	-	12.90	-
	Vanadium	8.47	83,100,000	--	--	--	1380	2750	<0.025	3560	3710	0.0293	3350	<0.0250	3060	<0.025
	Zirconium	--	9,940	--	--	--	1210	-	-	509	-	-	880	-	1380	-
	Chromium	4.88	5,150	5.0	530,000	--	33.80	80.90	-	83.10	84.30	-	145	<0.00500	70	-
Anions Methods 9012, 9056A	Cyanide	7.45	1,140,000	--	210	700	2.58	18.80 (HT)	-	2.04	2.57 (HT)	-	1.23	-	1.82	-
	Fluoride	94.80	997,000,000	--	--	--	280	255	-	612	134	-	388	-	505	-
Metal Ion Method 7199	Chromium (vi) (+6)	4.88	736	--	49	6.3	**7.98** (J)	**62.30**	-	**8.33** (J)	**<9.03** (HT, Q)	-	**17.20**	-	**<23.70**	-

Notes:
Bold: Greater than either Oregon RBC to Construction or Occupational Worker values
Highlighted in tan: Greater than DRAS Maximum Allowable Total Concentration values
Highlighted in light gray: 20 times greater than DRAS Maximum Allowable TCLP Concentration values or 20 times greater than TCLP RCRA Toxicity Characteristic Regulatory Level values
Highlighted in purple: Greater than DRAS Maximum Allowable TCLP Concentration values
- : TCLP or Total Testing not performed
HT : At clients request, samples was analyzed outside of recommended holding time.
Q : Detection levels elevated due to sample matrix.
J : The identification of the analyte is acceptable; the reported value is an estimate.

1. Total concentration for Zirconium tested by Specialty. All other total concentrations tested by ESC.
2. All TCLP analysis performed by Specialty.
3. Duplicate analysis performed by Specialty.
4. Maximum Allowable TCLP and Total Concentration determined for pond sediment from DRAS using example analyses and the following inputs:
    - Waste Management Unit Type - Landfill
    - Waste Volume - 3,120 cubic yards
    - Cancer Risk Level - 1E-6
    - Hazard Quotient (HQ) - 1.0
    - Waste management Unit Active Life - One Year Batch
    - Active Life - 20 years

TABLE 4B
TOTAL ANALYTE ANALYSIS FOR EVAPORATION POND SEDIMENT
F006 DELISTING PETITION
SELMET INC.
SALEM, OREGON

Analyte Group	Individual Analytes	DRAS Maximum Allowable TCLP Concentration (mg/L)^4	DRAS Maximum Allowable Total Concentration (mg/kg)^4	TCLP RCRA Toxicity Characteristic Regulatory Levels (mg/L)	Oregon RBC - Direct Contact to Construction Worker (mg/kg)	Oregon RBC - Direct Contact to Occupational Worker (mg/kg)	4/18/2018		4/18/2018		4/12/2018			4/18/2018		4/18/2018		4/18/2018		4/18/2018		4/18/2018	
							POND COMPOSITE A		POND GRID 16		POND COMPOSITE B			POND GRID 26		POND COMPOSITE C		POND GRID 42		POND COMPOSITE D		POND GRID 59	
							Composite Sample		Discrete Sample		Composite Sample			Discrete Sample		Composite Sample		Discrete Sample		Composite Sample		Discrete Sample	
							Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	Total (mg/kg)^3	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2	Total (mg/kg)^1	TCLP (mg/L)^2
Anions Methods 9056A, 9012	Fluoride	1,470	1,630,000,000	--	--	--	3,080	-	-	-	5,990	-	-	-	-	3,500	-	-	-	4,190	-	-	-
	Cyanide	116	12,200,000	--	210	700	<0.58	-	-	-	0.376	-	-	-	-	0.0950 (J)	-	-	-	<0.555	-	-	-
Metals Methods 6010B, 7471A	Antimony	4.03	3,870,000	--	--	--	<93	0.136	-	-	<66.0	-	-	-	-	<44.2	-	-	-	<44.4	-	-	-
	Arsenic	0.032	5,650	5	15	1.90	**<93**	0.022	-	-	**<66.0**	-	0.0174	-	-	**<44.2**	<0.005	-	-	**<44.4**	<0.005	-	-
	Barium	1,340	24,900,000	100	69,000	220,000	75.7	-	-	-	191	-	-	-	-	114	-	-	-	122	-	-	-
	Beryllium	2.93	41,700	--	700	2,300	<9.30	-	-	-	<6.60	-	-	-	-	<4.42	-	-	-	<4.44	-	-	-
	Cadmium	3.42	55,600	1	350	1,100	<23.30	<0.0050	-	-	<16.5	-	-	-	-	<11.1	-	-	-	<11.1	-	-	-
	Chromium	67	8,340	5	530,000	--	110	0.028	-	-	205	-	0.0632	-	-	80.4	-	-	-	97.5	-	-	-
	Cobalt	7.71	11,100	--	--	--	<46.50	-	-	-	<33.0	-	-	-	-	<22.1	-	-	-	10.1 (J)	-	-	-
	Copper	880	21,800,000	--	14,000	47,000	<93	-	-	-	44.6	-	-	-	-	<44.2	-	-	-	17.4 (J)	-	-	-
	Lead	19.60	9,560,000	5	800	800	<23.30	-	-	-	7.01	-	-	-	-	<11.1	-	-	-	<11.1	-	-	-
	Manganese	602	2,490,000	--	8,200	25,000	185	-	-	-	273	-	-	-	-	130	-	-	-	179	-	-	-
	Mercury	2.55	8,170,000	0.20	110	350	<0.047	-	-	-	0.0287	-	-	-	-	<0.0442	-	-	-	<0.0444	-	-	-
	Molybdenum	122	136,000,000	--	--	--	80.5	-	-	-	84.1	-	-	-	-	115	-	-	-	81.0	-	-	-
	Nickel	505	417,000	--	7,000	22,000	32.2 (J)	-	-	-	50.9	-	-	-	-	16.9 (J)	-	-	-	27.5 (J)	-	-	-
	Selenium	32.60	15,000,000	1	--	--	<93	0.094	-	-	<66.0	-	0.0656	-	-	<44.2	<0.05	-	-	<44.4	<0.050	-	-
	Silver	253	22,000,000	5	1,800	5,800	105	0.0099	-	-	173	-	0.0208	-	-	190	0.0121	-	-	73.3	-	-	-
	Thallium	1.37	2,550	--	--	--	<93	<0.0250	-	-	<66.0	-	<0.0250	-	-	<44.2	<0.0250	-	-	<44.4	<0.0250	-	-
	Vanadium	123	136,000,000	--	--	--	1,130	-	-	-	2,160	-	-	-	-	1,330	-	-	-	1,060	-	-	-
	Zinc	7,600	56,300,000	--	--	--	56.7 (J)	-	-	-	92.9	-	-	-	-	44.0 (J)	-	-	-	53.8 (J)	-	-	-
	Zirconium	--	106,000	--	--	--	2,020	-	-	-	1,290	-	-	-	-	803	-	-	-	1,130	-	-	-
Polychlorinated Biphenyls Method 8082	PCB 1016	1,000,000,000	0.075	--	4.90	0.59	<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1221						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1232						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1242						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1248						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1254						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1260						<0.0395	-	-	-	**<0.825**	<0.0238 (HT)	-	-	-	<0.0376	-	-	-	<0.0377	-	-	-
	PCB 1262						-	-	-	-	-	<0.0238 (HT)	-	-	-	-	-	-	-	-	-	-	-
	PCB 1268						-	-	-	-	-	<0.0238 (HT)	-	-	-	-	-	-	-	-	-	-	-
Metal Ion Method 7199	Chromium (vi) (+6)	67	1,190	--	49	6.30	**<23.30**	-	-	-	3.14	-	-	-	-	**<22.1**	-	-	-	**17.9** (J)	-	-	-
Semi-Volatile Organic Compounds Method 8270	2,4,6-Trichlorophenol	3.76	234,000	2	270	210	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	2,4-Dichlorophenol	63.80	9,300,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	2,4-Dimethylphenol	425	234,000,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	2,4-Dinitrophenol	43.40	54,500,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	2,4-Dinitrotoluene	0.062	240,000	0.13	--	--	<7.74	<0.021	-	-	<16.2	-	<0.0128	-	-	<7.36	<0.0132	-	-	<7.39	<0.0155	-	-
	2,6-Dinitrotoluene	0.062	240,000	--	13	1.50	**<7.74**	<0.021	-	-	**<16.2**	-	<0.0128	-	-	**<7.36**	<0.0132	-	-	**<7.39**	<0.0155	-	-
	2-Chlorophenol	108	76,200,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	3,3-Dichlorobenzidine	0.095	7,840	--	42	5.10	**<7.74**	<0.021	-	-	**<16.2**	-	<0.0128	-	-	**<7.36**	<0.0132	-	-	**<7.39**	<0.0155	-	-
	4,6-Dinitro-o-cresol	2.18	2,720,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Acenaphthene	399	41,500,000	--	21,000	70,000	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Anthracene	972	47,000,000	--	110,000	350,000	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Benzidine	0.00018	684	--	0.082	0.010	**<7.74**	<0.0084	-	-	**<16.2**	-	<0.00513	-	-	**<7.36**	<0.00529	-	-	**<7.39**	<0.00619	-	-
	Benzo[a]anthracene; Benzanthracene	0.26	310	--	24	2.90	<0.014 (J3)	-	-	-	0.0302	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Benzo[a]pyrene	98.70	23	--	2.40	0.29	0.0076 (J, J3)	-	-	-	**<0.297**	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Benzo[b]fluoranthene	840	181	--	24	2.90	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	0.00159 (J)	-	-	-	0.00145 (J)	-	-	-
	Benzo[k]fluoranthene	2,510,000,000,000,000,000	2,140	--	240	29	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Beta-chloronaphthalene	384	27,200,000	--	--	--	<0.77	-	-	-	<0.990	-	-	-	-	<0.0442	-	-	-	<0.0444	-	-	-
	Bis(2-chloroisopropyl)ether	856	287,000,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Butyl benzyl phthalate; Benzyl butyl phthalate	1,500	13,700,000	--	--	--	0.30 (J)	-	-	-	2.62	-	-	-	-	0.243 (J)	-	-	-	0.408 (J)	-	-	-
	Chrysene	26.30	30,400	--	2,400	290	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Dibenz[a,h]anthracene	1,390,000,000,000	24.20	--	2.40	0.29	<0.014 (J3)	-	-	-	**<0.297**	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Dichloroethyl ether	0.42	156,000	--	16	1.30	**<7.74**	-	-	-	**<16.2**	-	<0.00513	-	-	**<7.36**	-	-	-	**<7.39**	-	-	-
	Dichloromethoxy ethane	63.80	81,700,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Diethyl phthalate	37,500	7,600,000,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Dimethyl phthalate	217,000	272,000,000,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Di-n-butyl phthalate	923	14,100,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Fluoranthene	92.30	778,000	--	10,000	30,000	0.0018 (J, J3)	-	-	-	0.0769	-	-	-	-	0.00187 (J)	-	-	-	0.00183 (J)	-	-	-
	Fluorene	184	12,700,000	--	14,000	47,000	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Hexachlorobenzene	0.34	11.60	0.13	11	0.93	**<7.74**	<0.00420	-	-	**<16.2**	-	<0.00256	-	-	**<7.36**	<0.00265	-	-	**<7.39**	<0.00310	-	-
	Hexachloroethane	3.13	60,600	3	180	32	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Indeno(1,2,3-cd)pyrene	9,240,000,000	571	--	24	2.9	<0.014 (J3)	-	-	-	<0.297	-	-	-	-	<0.0133	-	-	-	<0.0133	-	-	-
	Isophorone	42.20	84,000,000	--	--	--	<7.74 (J3)	-	-	-	<16.2	-	-	-	-	<7.36 (J3)	-	-	-	<7.39 (J3)	-	-	-
	Nitrobenzene	10.80	13,600,000	2	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	N-nitrosodimethylamine	0.00083	2,060	--	--	--	<7.74	<0.00420	-	-	<16.2	-	<0.00256	-	-	<7.36	<0.00265	-	-	<7.39	<0.00310	-	-
	N-nitrosodiphenylamine	8.50	1,400,000	--	3,800	470	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	N-nitrosodipropylamine; Di-n-propylnitrosamine	0.0060	21,700	--	2.70	0.33	**<7.74**	<0.00840	-	-	**<16.2**	-	<0.00513	-	-	**<7.36**	<0.00529	-	-	**<7.39**	<0.00619	-	-
	Pentachlorophenol	0.091	20,300	100	34	4	**<7.74**	<0.021	-	-	**<16.2**	-	<0.0128	-	-	**<7.36**	<0.0132	-	-	**<7.39**	<0.0155	-	-
	Phenol	6,510	8,170,000,000	--	--	--	<7.74	-	-	-	<16.2	-	-	-	-	<7.36	-	-	-	<7.39	-	-	-
	Pyrene	167	1,400,000	--	7,500	23,000	0.00152 (J, J3)	-	-	-	0.0518	-	-	-	-	0.00212 (J)	-	-	-	0.00188 (J)	-	-	-

TABLE 4B
TOTAL ANALYTE ANALYSIS FOR EVAPORATION POND SEDIMENT
F006 DELISTING PETITION
SELMET INC.
SALEM, OREGON

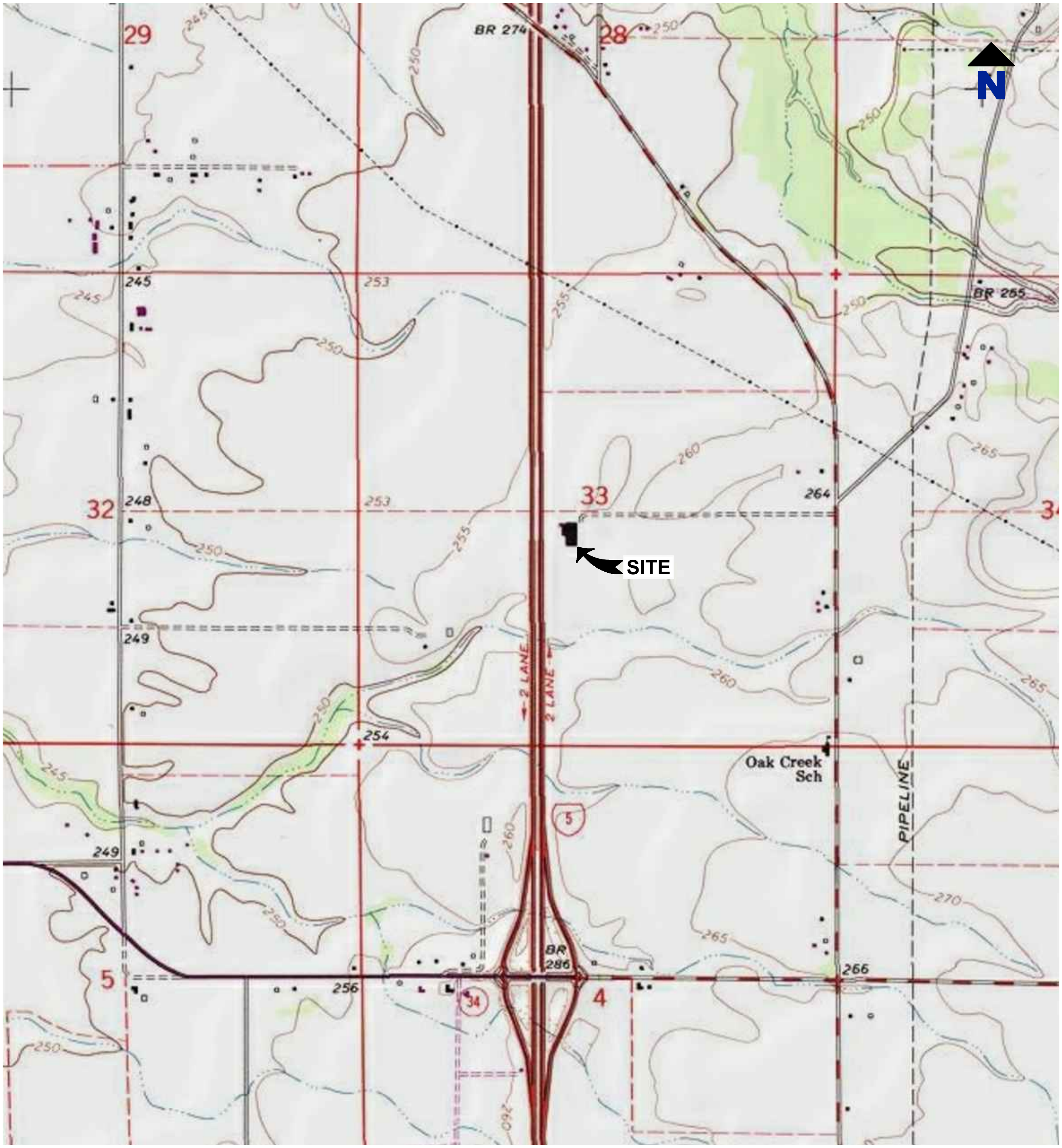
Analyte Group	Individual Analytes	DRAS Maximum Allowable TCLP Concentration (mg/L)[4]	DRAS Maximum Allowable Total Concentration (mg/kg)[4]	TCLP RCRA Toxicity Characteristic Regulatory Levels (mg/L)	Oregon RBC - Direct Contact to Construction Worker (mg/kg)	Oregon RBC - Direct Contact to Occupational Worker (mg/kg)	4/18/2018		4/18/2018		4/12/2018			4/18/2018		4/18/2018		4/18/2018		4/18/2018		4/18/2018	
							POND COMPOSITE A		POND GRID 16		POND COMPOSITE B			POND GRID 26		POND COMPOSITE C		POND GRID 42		POND COMPOSITE D		POND GRID 59	
							Composite Sample		Discrete Sample		Composite Sample			Discrete Sample		Composite Sample		Discrete Sample		Composite Sample		Discrete Sample	
							Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	Total (mg/kg)[3]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]	Total (mg/kg)[1]	TCLP (mg/L)[2]
Volatile Organic Compounds Methods 8260B, 8270	1,1,1,2-Tetrachloroethane	2.07	633,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,1,2,2-Tetrachloroethane	173	125,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,1,2-Trichloroethane	0.72	383,000	--	54	26	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,1-Dichloroethane	1,980	137,000,000	--	3,200	240	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,1-Dichloroethylene; Vinylidene chloride	4.04	21,000,000	0.70	13,000	29,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,2,3-Trichloropropane	0.0083	4,410	--	--	--	-	-	<0.00534	-	-	-	-	<0.00402	-	-	-	<0.00440	-	-	-	<0.0149	-
	1,2,4-Trichlorobenzene	37.20	174,000,000	--	--	--	<7.74	-	<0.00214	-	<16.2	-	-	<0.00161	-	<7.36	-	<0.00176	-	<7.39	-	<0.00596	-
	1,2-Dibromo-3-chloropropane	0.0054	11,500	--	--	--	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	1,2-Dibromoethane; Ethylene dibromide	2.88	26,600	--	9	0.65	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,2-Dichloroethane; Ethylene dichloride	0.40	60,200	0.50	200	15	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	1,2-Dichloropropane	1.27	470,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	4-Methyl-2-pentanone; Methyl isobutyl ketone (MIBK)	1,730	2,180,000,000	--	--	--	-	-	0.00474 (J)	-	-	-	-	<0.0161	-	-	-	<0.0176	-	-	-	<0.0596	-
	Acetone	19,500	1,060,000,000	--	--	--	-	-	0.275	-	-	-	-	0.0924	-	-	-	0.0319 (J)	-	-	-	1.25	-
	Acrylonitrile	0.085	20,000	--	40	4	-	-	<0.0214	-	-	-	-	<0.0161	-	-	-	<0.0176	-	-	-	<0.0596	-
	Benzene	0.77	184,000	0.50	380	37	-	-	0.00111 (J)	-	-	-	-	0.000823 (J)	-	-	-	0.000665 (J)	-	-	-	0.00848	-
	Bromodichloromethane	0.51	183,000	--	230	11	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Bromoform; Tribromomethane	5.69	3,110,000	--	2,700	260	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Carbon Tetrachloride	0.53	99,900	0.50	320	34	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Chlorobenzene	56.60	91,100,000	--	4,700	8,700	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Chloroethane; Ethyl chloride	8,670	4,620,000	--	--	--	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Chloroform	0.30	31,800	6	410	17	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Cis-1,3-dichloropropene	27,400,000,000,000,000,000,000,000,000	446,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Cumene (isopropylbenzene)	887	109,000,000	--	27,000	57,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Dibromochloromethane; Chlorodibromomethane	0.52	446,000	--	210	14	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Dichlorodifluoromethane	596	2,010,000	--	--	--	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Dichloroethylene cis-1,2-	40.40	253,000,000	--	710	2,300	-	-	<0.0214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Ethylbenzene	407	265,000,000	--	1,700	150	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Hexachlorobutadiene[5]	0.31	2,070	0.50	--	--	<7.74	-	<0.00214	-	<16.2	-	<0.00513	<0.00161	-	<7.36	-	<0.00176	-	<7.39	-	<0.00596	-
	Methyl bromide; Bromomethane	412,000,000,000,000,000,000,000	203,000	--	370	700	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Methyl chloride; Chloromethane	227	1,480,000	--	25,000	25,000	-	-	<0.00534	-	-	-	-	<0.00402	-	-	-	<0.00440	-	-	-	<0.0149	-
	Methyl Chloroform; 1,1,1-trichloroethane	436,000	1,790,000,000	--	470,000	870,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Methyl ethyl ketone (MEK); 2-butanone	13,000	4,230,000,000	200	--	--	-	-	<0.0214	-	-	-	-	<0.0161	-	-	-	<0.0176	-	-	-	0.0385 (J)	-
	Methylene bromide; Dibromomethane	217	272,000,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Methylene chloride; Dichloromethane	2.96	722,000	--	2,100	1,600	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Naphthalene	0.12	1,000,000	--	580	23	<0.0465	-	<0.0107	-	<0.990	-	-	<0.00803	-	<0.0442	-	<0.00880	-	<0.0444	-	<0.0298	-
	O-dichlorobenzene	349	146,000,000	--	20,000	36,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	P-dichlorobenzene	1.78	166,000	--	64	36	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Styrene	56.60	752,000,000	--	56,000	130,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Tetrachloroethylene; Perchloroethylene; Tetrachloroethene	0.077	7,920	0.70	1,800	1,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Toluene	566	442,000,000	--	28,000	88,000	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Trans-1,2-dichloroethylene	57.80	9,910,000	--	7,100	23,000	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Trans-1,3-dichloropropene	27,400,000,000,000,000,000,000,000,000	470,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Trichloro-1,2,2-trifluoro-ethane 1,1,2-	27,500	741,000,000	--	--	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Trichloroethylene; Trichloroethene	2.91	1,150,000	0.50	470	--	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Trichlorofluoromethane	578	9,230,000	-	69,000	130,000	-	-	<0.0107	-	-	-	-	<0.00803	-	-	-	<0.00880	-	-	-	<0.0298	-
	Vinyl chloride	0.030	5,430	0.20	34	4.4	-	-	<0.00214	-	-	-	-	<0.00161	-	-	-	<0.00176	-	-	-	<0.00596	-
	Xylene (total)	359	558,000,000	--	20,000	25,000	-	-	<0.00641	-	-	-	-	<0.00482	-	-	-	<0.00528	-	-	-	<0.0179	-

Notes:

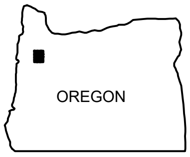
Bold: Greater than either Oregon RBC to Construction or Occupational Worker values
Highlighted in tan: Greater than DRAS Maximum Allowable Total Concentration values
Highlighted in light gray: 20 times greater than DRAS Maximum Allowable TCLP Concentration values or 20 times greater than TCLP RCRA Toxicity Characteristic Regulatory Level values
Highlighted in purple: Greater than DRAS Maximum Allowable TCLP Concentration values
- : TCLP or Total Testing not performed
J : The identification of the analyte is acceptable; the reported value is an estimate.
J3: The associated batch QC was outside the established quality control range for precision.
HT : At clients request, samples was analyzed outside of recommended holding time.

1. Total concentration for Zirconium tested by Specialty. All other total concentrations tested by ESC.
2. All TCLP analysis performed by Specialty.
3. Duplicate PCB analysis performed by Specialty.
4. Maximum Allowable TCLP and Total Concentration determined for pond sediment from DRAS using example analyses and the following inputs:
    - Waste Management Unit Type - Landfill
    - Waste Volume - 3,800 cubic yards
    - Cancer Risk Level - 1E-6
    - Hazard Quotient (HQ) - 1.0
    - Waste management Unit Active Life - One Year Batch
    - Active Life - 1 years
5. Follow-up TCLP analysis on hexachlorobutadiene for samples Pond Composite A, Pond Composite C, and Pond Composite D was not necessary because corresponding pond grid aliquots total concentrations were less than 20 times the TCLP benchmark.

FIGURES



REFERENCED FROM : USGS 7.5 MINUTE QUADRANGLE
TAGENT, OREGON 1986



SCALE: 1" = 2000'

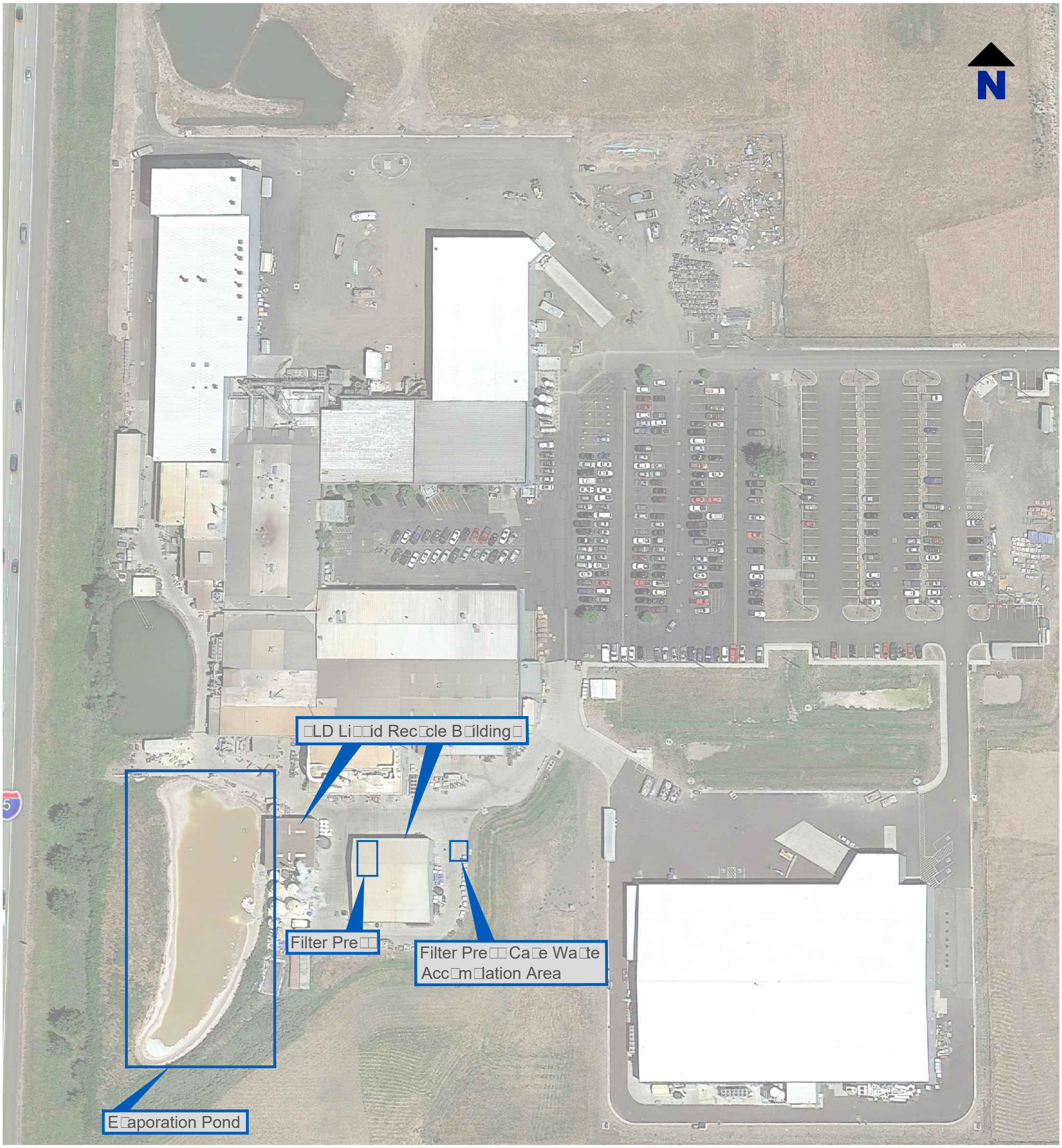
0' 2000' 4000' 6000'

SELMET, INC.
33992 7 MILE LN SE
ALBANY, OREGON 97322

Report
F006 HAZARDOUS WASTE DELISTING

Drawing
SITE LOCATION MAP

Date	MAY 2018	Scale	AS Shown	Fig. No.	1
File Name		Project No.	108.00256.00017		



SELMET, INC.
33992 7 MILE LN SE
ALBANY, OREGON 97322

Report

F006 HAZARDOUS WASTE DELISTING

Drawing

SITE LAYOUT

Date	MAY 2018	Scale	As Shown	Fig. No.
File Name		Project No.	108.00256.00017	2

SLR

PAGE INCLUDED SEPERATELY

CONFIDENTIAL BUSINESS INFORMATION

APPENDIX A

2017 SELMET HAZARDOUS WASTE INFORMATION

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CONFIDENTIAL BUSINESS INFORMATION

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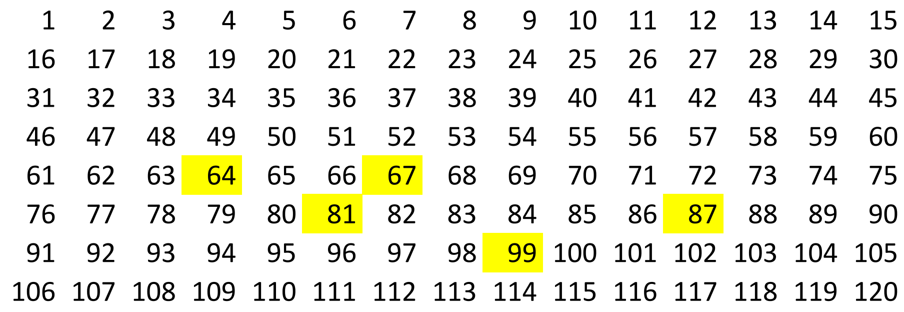
CONFIDENTIAL BUSINESS INFORMATION

APPENDIX B

SAMPLING LOCATIONS

FILTER PRESS CAKE SAMPLING LOCATIONS
SELMET F006 DELISTING PETITION

Period 1 (15x 8)



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31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
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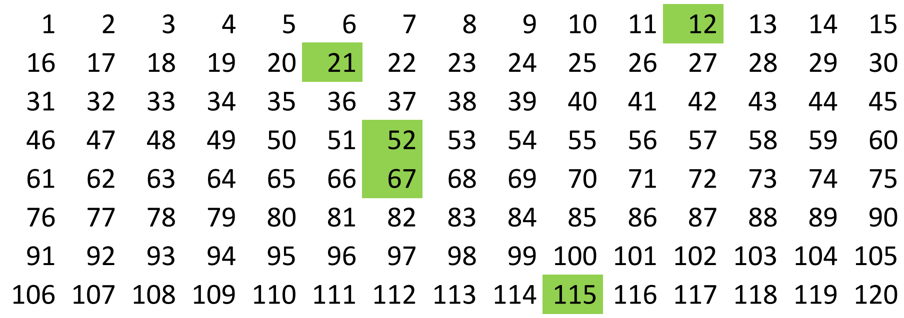
Period 2 (15x 8)



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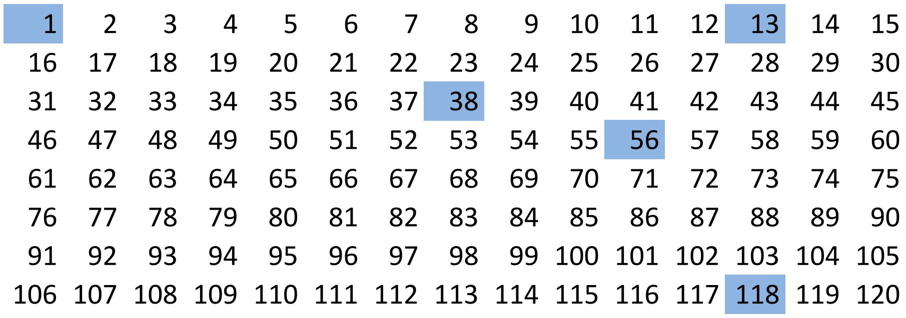
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

Period 3 (15x 8)



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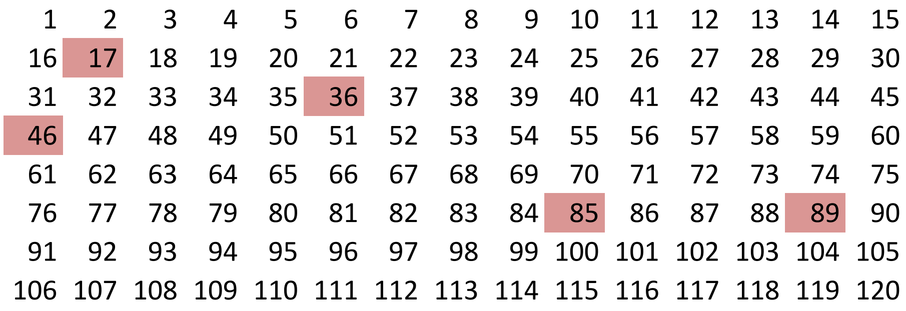
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

Period 4 (15x 8)



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
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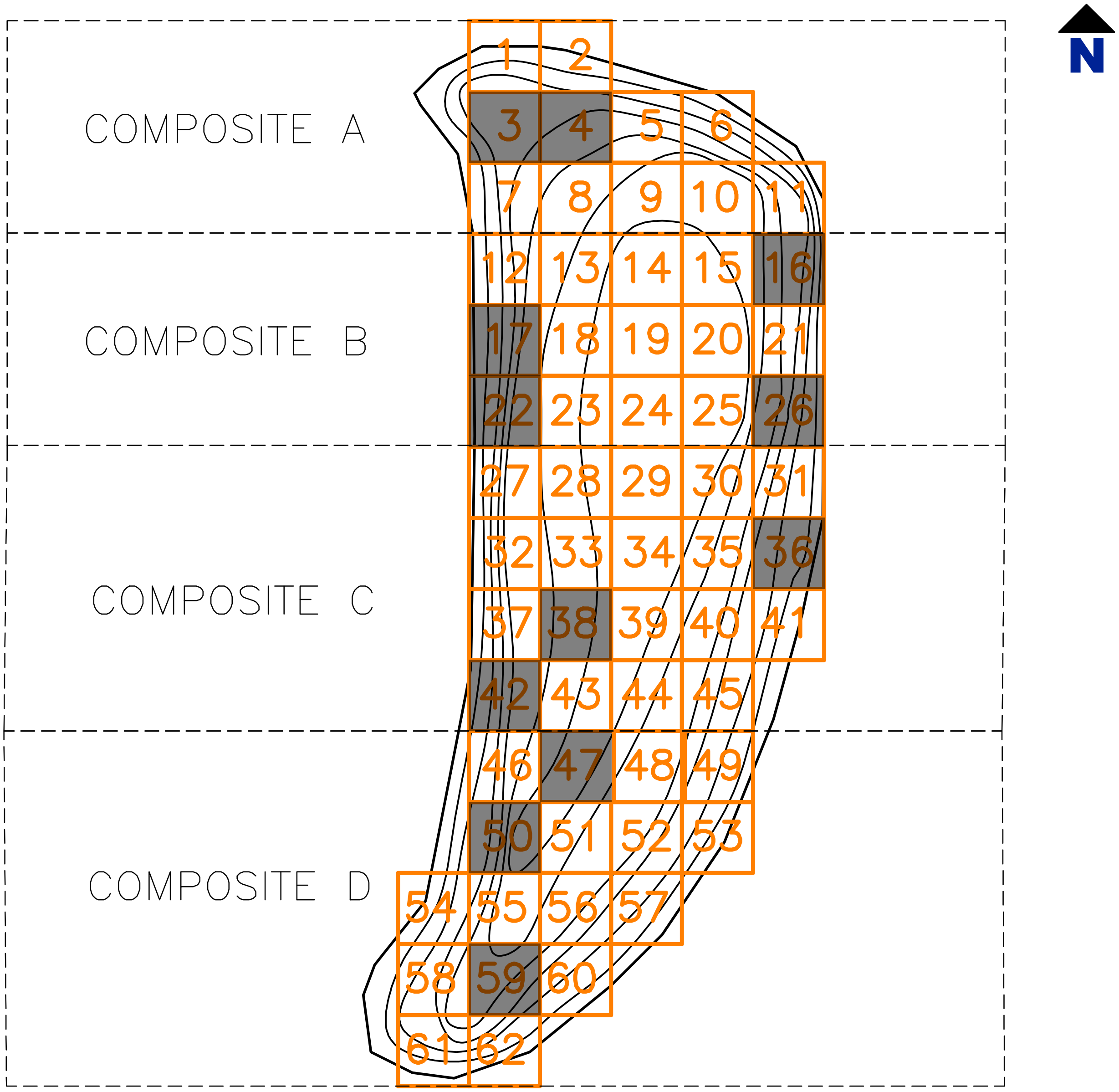


LEGEND	
☐	20' x 20' GRID SPACING
———	1' BATHYMETRIC LINES
■	ALIQUOT LOCATION

SLR

SELMET INC
33992 SEVEN MILE LANE
ALBANY, OREGON

Report
DELISTING PETITION

Drawing
POND SAMPLING LOCATIONS

Date JULY 2017
File Name POND MEASUREMENTS_10-4-17
Scale AS SHOWN
Project No. 108.00256.00029
Fig. No.

APPENDIX C

LABORATORY TESTING INFORMATION

ESC Employee List

Analyst Name	ID #	Job Title	Analysis/ Instrumentation	Years of Exp.	Education/Year Graduated
WetChem					
Kara Kozlowski	786	Assistant Chemist	LaChat	2	B.S. Biology, 2012
Nasha Moulon	236	Chemist	LaChat	10	B.S. Chemistry, 2006
Mary Garrett	183	Chemist	Prep, LaChat, IC	11	A.S. Chemistry, 2013 + 11 years lab experience
Garrett Bryant	818	Assistant Chemist	Short Holds	<1	B.S. Biology, 2017
Michael James	759	Assistant Chemist	Prep, IC	1	B.S. Biology, 2014
Dibran Rexihepi	645	Chemist	LaChat, IC	4	B.S. Biology, 2013
Simo Tami	447	Chemist	ICP/ICPMS	9	M.S. Chemistry/B.S. Chemistry, 2000
Metals					
Blake Lansford	802	Assistant Chemist	Metals prep, Hg	1	B.S. Microbiology, 2016
Taylor Baldwin	708	Assistant Chemist	ICP/Hg	2	B.S. Forensic Science, 2015
Elizabeth Lerch	684	Assistant Chemist	Metals Prep, Hg	3	3 year college
Charles Evans	572	Chemist	Hg/ICP	10	B.S. Mathematics , 2003
SVOCs					
Tommy Donald	473	Assistant Chemist	Extractions	8	H.S. + 8 years lab experience
Christopher Rucker	140	Chemist	SVOC GC/MS	12	B.S. Chemistry, 1996
Daisy Goodman	614	Chemist	SVOC GC/MS	9	B.S. Horticulture, 2006
TS					
Jonathan Deboard	832	TS Analyst	Total Solids	1	High School/Some college

ESC Equipment List

ID	Manufacturer	Model
L988246		
IC-13	Thermo Fisher	ICS 1600
ICP13	Thermo	7400
LACHAT4	Lachat	Quikchem 8500
LOGBAL3	Mettler	XS2O4
IC-8	Dionex	ICS 2000
L987450		
VOCMS33	Agilent	7890 GC/5975MSD
VOCMS7	Agilent	6890 GC/5973MSD
IC-11	Dionex	ICS 2100
LACHAT4	Lachat	Quikchem 8500
BNAMS4	Agilent	6890GC/5973MSD
SVGC18	Agilent	7890 GC/5975MSD
BNAMS25	Agilent	7890GC/5975MSD
LOGBAL3	Mettler	XS2O4
LOGBAL4	Mettler	MS2O4TS/00
IC-13	Thermo Fisher	ICS 1600
ICP12	Thermo	7400
CVAA3	Perkin Elmer	FIMS 100
L985817		
IC-11	Dionex	ICS 2100
IC-13	Thermo Fisher	ICS 1600
LOGBAL1	Mettler	MS204S
ICP13	Thermo	7400
LACHAT4	Lachat	Quikchem 8500

ESC Equipment List

ID	Manufacturer	Model
L985823		
LACHAT4	Lachat	Quikchem 8500
IC-13	Thermo Fisher	ICS 1600
BNAMS25	Agilent	7890GC/5975MSD
SVGC14	Agilent	7890 GC/5975MSD
LOGBAL1	Mettler	MS204S
CVAA3	Perkin Elmer	FIMS 100
ICP13	Thermo	7400
IC-11	Dionex	ICS 2100
BNAMS16	Agilent	7890GC/5975MSD
L983055		
ICP12	Thermo	7400
LACHAT4	Lachat	Quikchem 8500
IC-13	Thermo Fisher	ICS 1600
IC-11	Dionex	ICS 2100
LOGBAL4	Mettler	MS2O4TS/00
L980373		
ICP12	Thermo	7400
LACHAT4	Lachat	Quikchem 8500
IC-13	Thermo Fisher	ICS 1600
LOGBAL3	Mettler	XS2O4
IC-11	Dionex	ICS 2100

SPECIALTY ANALYTICAL EMPLOYEE LIST

NAME:	HIRE DATE:		EDUCATION:		TECH SPECIALTY
Andrew Riddell	02/2012		B.S. Chemistry		Chemist
Austin Mobley	10/2017		B.S. Biology		Organic Prep
Ben Walker	01/2014		B.S. BioChemistry		Inorganic/Organic Analyst
Chris Knox	03/2013		B.S. Chemistry		Vol/Semi Organic Analyst
Julie Clay	07/2003		B.S. Biology		Operations Manager / Inorganic/Organic Analyst
Katherine Lynch	04/2017		B.S. Biology/		Admin / Project Management
			Conservation & Environmental Science		
Marty French	1997		B.S. Chemistry/Biology		Lab Director
Alyssa Gardner	08/2015		3rd yr / Sciences		Courier
Jacob Tietsort	09/2015		B.S. Biology		Inorganic Analyst
Jacob Hostetler	03/2017		B.S. Biology		Organic Analyst

SPECIALTY ANALYTICAL EQUIPMENT LIST

Department	**Inst. ID**	**Insturment Description**	**Serial #**
Metals	ICPMS	PE NexION-350	85VN4121301
Metals	CVAF	CETAC Quick Trace M-8000	10801QM8
GCMS VOL	5973J	Agilent GC:6890/MS:5973	US00023631/US82311218
GCMS VOL	5975X	Agilent GC:7890/MS:5975C	CN10817045/US80629090
GCMS SEMI	5973G	Agilent GC:6890/MS:5973	US00005558/US63810119
GCMS SEMI	5973P	Agilent GC:6890/MS:5973	CN10433066/US94260132
GCMS SEMI	5975Q	Agilent GC:6890/MS:5975	CN10547200/US54421616
GC SEMI	GC-M	Agilent GC:6890 (FID)	US00031528
GC SEMI	GC-O	Agilent GC:6890 (FID)	US10151052
GC VOL	GC-S	Agilent 7890 (PID/FID)	CN10823116
PEST	GCK	Agilent 6890 (Dual ECD)	US00022531
PEST	GC-R	Agilent 7890 (Dual ECD)	CN1081302
Wetchem	LACHAT	Lachat QuickChem FIA+	A83000-1484
Wetchem	DIONEX2100	Dionex ICS-2100	12081157
Wetchem	IC	Dionex IC DX-120	99110575
Wetchem	HPLC	Agilent HPLC	DE63055546/DE63059850
Wetchem	MANTECH	Mantech PC-Titrate	MS-OJ3-348
Wetchem	TOC-APOLLO	Tekmar Apollo 9000	US01152005
Wetchem	GENESYS	Thermo Genesys 20	3SGS155006
Wetchem	OIFS3100	OI FS3100	21831323
Wetchem	PH Accumet	Fisher PH Accumet	9120030
Wetchem	TURB	VWR 6612-200 Turbidity	TUR800 1944
Wetchem	Analytical Balance	Denver Insturment Co. A-160	N0083453
Wetchem	COND	Jenway Conductivity Meter 4310	2807
Wetchem	FLASH	Koehler 16200	R61091101
MICRO	Autoclave	Market Forge STM-E Autoclave	Jul-85
MICRO	Dissolved Oxygen Meter	YSI-5100-115V	08A101589
MICRO	BOD_INC	Norlake Scientific	7061391
MICRO	INCUBATOR	Fisher @35°	911N0297
MICRO	INCUBATOR	Fisher @44.5°	204N0056
ALL	Nanopure	Barnstead Nanpure II	8810086

APPENDIX D

FILTER PRESS CAKE PERIOD 1 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD

ANALYTICAL REPORT

April 03, 2018

Selmet, Inc

Sample Delivery Group:	L980373
Samples Received:	03/24/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting

Report To:

Tyler Weber
33992 SE Seven Mile Lane
Albany, OR 97322

Entire Report Reviewed By: Brian Ford

Brian Ford
Technical Service Representative

TABLE OF CONTENTS

	Collected by	Collected date/time	Received date/time
PERIOD 1 FILTER PRESS CAKE L980373-01 Solid	Tyler Weber	03/22/18 11:10	03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1091486	1	03/30/18 11:53	03/30/18 12:14	JD
Wet Chemistry by Method 7199	WG1090383	10	03/30/18 10:30	03/30/18 17:08	NJM
Wet Chemistry by Method 9012B	WG1090065	1	03/27/18 21:37	03/28/18 09:42	KK
Wet Chemistry by Method 9056A	WG1092170	5	04/01/18 10:00	04/01/18 13:15	MAJ
Metals (ICP) by Method 6010B	WG1089637	5	03/26/18 18:09	03/29/18 09:17	TRB

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	73.9	J3	1	03/30/2018 12:14	WG1091486

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	7.98	J	3.45	13.5	10	03/30/2018 17:08	WG1090383

Sample Narrative:

L980373-01 WG1090383: diluted due to matrix

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	2.58		0.0528	0.338	1	03/28/2018 09:42	WG1090065

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	280		1.76	6.77	5	04/01/2018 13:15	WG1092170

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cadmium	U		0.474	3.38	5	03/29/2018 09:17	WG1089637
Chromium	33.8		0.948	6.77	5	03/29/2018 09:17	WG1089637
Manganese	29.0		0.812	6.77	5	03/29/2018 09:17	WG1089637
Molybdenum	141		1.08	3.38	5	03/29/2018 09:17	WG1089637
Nickel	25.1		3.32	13.5	5	03/29/2018 09:17	WG1089637
Silver	U		1.90	6.77	5	03/29/2018 09:17	WG1089637
Vanadium	1380		1.62	13.5	5	03/29/2018 09:17	WG1089637

Method Blank (MB)

(MB) R3297996-1 03/30/18 12:14

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000			

L980373-01 Original Sample (OS) • Duplicate (DUP)

(OS) L980373-01 03/30/18 12:14 • (DUP) R3297996-3 03/30/18 12:14

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	73.9	78.8	1	6.51	J3	5

Laboratory Control Sample (LCS)

(LCS) R3297996-2 03/30/18 12:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3297883-1 03/30/18 14:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L979595-02 Original Sample (OS) • Duplicate (DUP)

(OS) L979595-02 03/30/18 14:56 • (DUP) R3297883-4 03/30/18 15:04

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.692	0.712	1	2.85	J	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297883-2 03/30/18 14:34 • (LCSD) R3297883-3 03/30/18 14:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	18.5	19.0	92.7	95.0	80.0-120			2.39	20

L980737-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980737-02 03/30/18 16:10 • (MS) R3297883-5 03/30/18 16:16 • (MSD) R3297883-6 03/30/18 16:22

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	25.8	U	22.7	22.9	87.8	88.6	1	75.0-125			0.897	20

L980737-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L980737-02 03/30/18 16:10 • (MS) R3297883-8 03/30/18 16:34

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	1620	U	1700	105	50	75.0-125	

Method Blank (MB)

(MB) R3296960-1 03/28/18 09:30

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.0390	0.250

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3296960-2 03/28/18 09:31 • (LCSD) R3296960-3 03/28/18 09:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.65	2.62	106	105	50.0-150			1.27	20

Method Blank (MB)

(MB) R3298309-1 04/01/18 11:51

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Fluoride	U		0.261	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298309-2 04/01/18 12:12 • (LCSD) R3298309-3 04/01/18 12:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluoride	20.0	20.4	20.6	102	103	80.0-120			1.10	15

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3297261-1 03/28/18 23:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Silver	U		0.280	1.00
Vanadium	U		0.240	2.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297261-2 03/28/18 23:45 • (LCSD) R3297261-3 03/28/18 23:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cadmium	100	97.8	99.9	97.8	99.9	80.0-120			2.10	20
Chromium	100	100	102	100	102	80.0-120			2.11	20
Manganese	100	95.4	97.9	95.4	97.9	80.0-120			2.55	20
Molybdenum	100	100	103	100	103	80.0-120			2.15	20
Nickel	100	99.1	101	99.1	101	80.0-120			2.27	20
Silver	20.0	18.0	18.5	90.2	92.7	80.0-120			2.75	20
Vanadium	100	97.8	99.2	97.8	99.2	80.0-120			1.47	20

L980383-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980383-02 03/28/18 23:51 • (MS) R3297261-6 03/29/18 00:00 • (MSD) R3297261-7 03/29/18 00:03

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	100	0.0809	99.5	101	99.4	101	1	75.0-125			1.32	20
Chromium	100	12.6	107	109	94.7	96.9	1	75.0-125			1.99	20
Manganese	100	161	246	231	85.2	70.1	1	75.0-125		J6	6.31	20
Molybdenum	100	U	95.0	96.1	95.0	96.1	1	75.0-125			1.14	20
Nickel	100	12.5	113	115	101	102	1	75.0-125			1.40	20
Silver	20.0	U	18.4	18.8	92.1	94.2	1	75.0-125			2.24	20
Vanadium	100	19.8	117	117	96.8	97.5	1	75.0-125			0.596	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

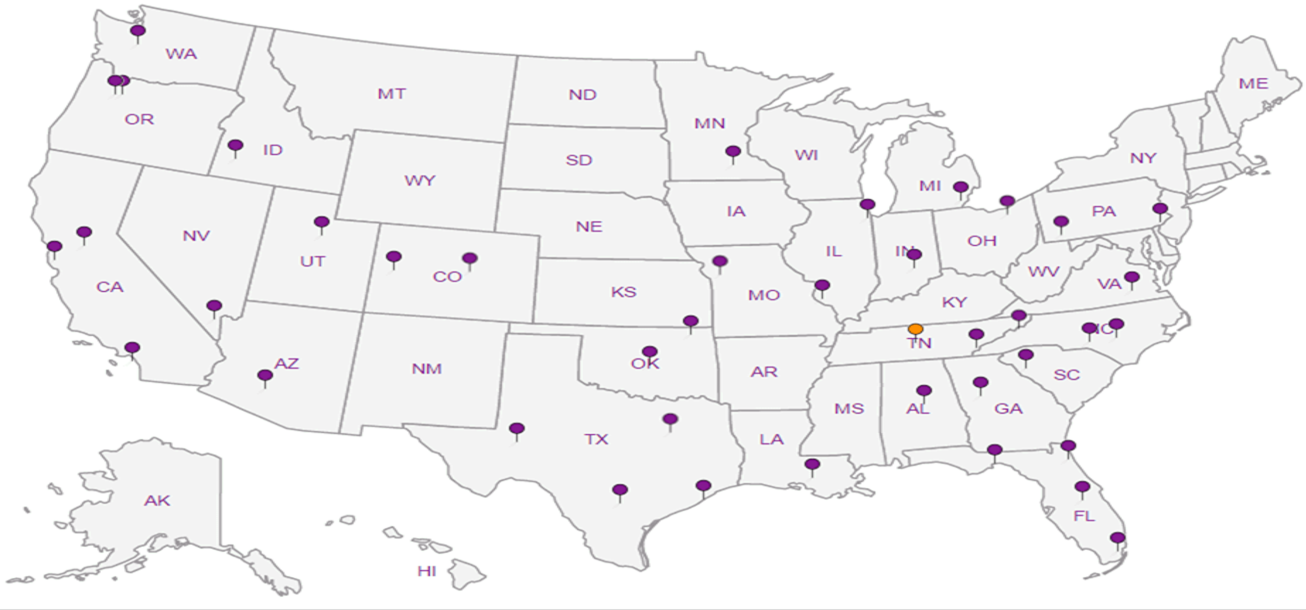
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SLR International Corp
1800 Blankenship Road, Suite 440
West Linn, OR 97068

Alternate billing information:
Accounts Payable
P.O. Box 689
Albany, OR 97321

Report to: Tyler Weber

Email to: tweber@slrconsulting.com

Chain of Custody
Page 1 of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

L980373

Project Description: Selmet F006 Delisting

City/State Collected: Albany, OR

Phone: (503) 723-4423
FAX:

Client Project #: 108.00256.00029

ESC Key:

Collected by: Tyler Weber

Site/Facility ID#:

P.O.#:

Collected by (signature):

Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
_____ Same Day........200%
_____ Next Day........100%
_____ Five Day..........25%

Date Results Needed:
Email? __No X Yes
FAX? __No__Yes

CoCode SLRWLOR (lab use only)
Template/Prelogin B201
Shipped Via:

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs 24	Cyanide, F, Cr6IC 8ozClr-No Pres	Total Metals* 2ozClr - No Pres						Remarks/Contaminant	Sample # (lab only)
Period 1 Filter Press Cake	Comp	SS		3/22/18	1110	4	X	X							-01

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other__________

pH __________ Temp __________

Remarks: * Total metals include - Cadmium, Chromium, Molybdenum, Nickel, Silver, Vanadium, and Manganese

7066 8128 9340

Flow __________ Other __________

Relinquished by: (Signature)	Date: 3/23/2018	Time: 12:00	Received by: (Signature)	Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ______	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.9 KM 50	Bottles Received: 4
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/24/18	Time: 8:45

pH Checked:

NCF:

ESC LAB SCIENCES

Cooler Receipt Form

Client: SLRWLOR SDG# C920375

Cooler Received/Opened On: 3/24/18 Temperature: 2.9

Received By: Kelsey Rish

Signature:

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 21, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1803216

Specialty Analytical received 1 sample(s) on 3/23/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1803216**
Date: **5/21/2018**

CLIENT: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029

This sample was hand delivered by the client on 3/23/2018 at 11:15.

Notes relating to quality control samples:

SMC flags reported on QC in this batch reflect results where the sample concentration is greater than 4x the spiked value. The spiked value is considered insignificant compared to the sample concentration. LCS values in this batch are within range.

Revision 1-

This report has been revised to report dry-weight corrected results.

Revision 2-

This report has been revised to correct the RL for TCLP Vanadium.

Revision 4-

Upon review this report was revised to correct the % moisture content.

Revision 5-

This report has been revised to add prep batch reports.

Revision 6-

This report has been revised to include a value for TCLP Mo per client request.

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp. **Collection Date:** 3/22/2018 11:10:00 AM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1803216-001
Client Sample ID: Period 1 Filter Press Cake **Matrix:** SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **JRC**
Percent Moisture	58.9	0		wt%	1	4/11/2018 4:30:00 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	1210000	22600		µg/Kg-dry	100	4/2/2018 3:45:04 PM
TCLP METALS ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Molybdenum, TCLP	187	25.0		µg/L	10	4/11/2018 1:07:20 PM
Vanadium, TCLP	ND	25.0		µg/L	10	4/11/2018 1:07:20 PM

QC SUMMARY REPORT

WO#: **1803216**

21-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25359**

Client ID: **ICV** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340587**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4990	100	5000	0	99.8	90	110				

Sample ID **LCS-11641** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/2/2018** RunNo: **25359**

Client ID: **LCSS** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340589**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5400	100	5000	0	108	80	120				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25359**

Client ID: **CCV** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340595**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4800	100	5000	0	95.9	90	110				

Sample ID **MB-11641** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/2/2018** RunNo: **25359**

Client ID: **PBS** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340596**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	ND	100									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1803216**
21-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **1803216-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/2/2018** RunNo: **25359**
Client ID: **Period 1 Filter Pres** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340598**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1170000	19300						1215000	4.13	20	

Sample ID **1803216-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/2/2018** RunNo: **25359**
Client ID: **Period 1 Filter Pres** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340599**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1210000	21900	10940	1215000	-38.7	70	130				SMC

Sample ID **1803216-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/2/2018** RunNo: **25359**
Client ID: **Period 1 Filter Pres** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340600**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1200000	23700	11850	1215000	-94.8	70	130	1211000	0.580	20	SMC

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25359**
Client ID: **CCV** Batch ID: **11641** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/2/2018** SeqNo: **340601**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4530	100	5000	0	90.5	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25446**
Client ID: **ICV** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341680**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	49.6	0.500	50.00	0	99.1	90	110				
Vanadium, TCLP	49.7	0.500	50.00	0	99.5	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25446**
Client ID: **CCV** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341682**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	47.3	0.500	50.00	0	94.6	90	110				
Vanadium, TCLP	49.7	0.500	50.00	0	99.4	90	110				

Sample ID **MB-11679** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**
Client ID: **PBW** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341683**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	ND	0.500									
Vanadium, TCLP	ND	0.500									

Sample ID **LCS-11679** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**
Client ID: **LCSW** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341684**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	47.4	0.500	50.00	0	94.9	80	120				

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **LCS-11679** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**

Client ID: **LCSW** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341684**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium, TCLP	50.1	0.500	50.00	0	100	80	120				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25446**

Client ID: **CCV** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341685**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	47.0	0.500	50.00	0	94.1	90	110				
Vanadium, TCLP	51.0	0.500	50.00	0	102	90	110				

Sample ID **A1804068-002ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**

Client ID: **ZZZZZZ** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341687**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	ND	0.500						0	0	20	
Vanadium, TCLP	ND	0.500						0	0	20	R

Sample ID **A1804068-002AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**

Client ID: **ZZZZZZ** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341688**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	52.9	0.500	50.00	0.1780	106	70	130				
Vanadium, TCLP	53.6	0.500	50.00	0.1294	107	70	130				

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_TCLP**

Sample ID **A1804068-002AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**

Client ID: **ZZZZZZ** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341688**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID **A1804068-002AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/10/2018** RunNo: **25446**

Client ID: **ZZZZZZ** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341689**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	55.1	0.500	50.00	0.1780	110	70	130	52.94	4.02	20	
Vanadium, TCLP	54.3	0.500	50.00	0.1294	108	70	130	53.60	1.25	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25446**

Client ID: **CCV** Batch ID: **11679** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/11/2018** SeqNo: **341693**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	48.1	0.500	50.00	0	96.1	90	110				
Vanadium, TCLP	50.7	0.500	50.00	0	101	90	110				

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR International Corporation
Address: 1800 Blankenship Rd, Suite 440
City, State, Zip: West Linn, OR, 97068
Telephone: 503-723-4423
Invoice To:

Date: 3/23/2018
Page: 1 of: 1
Project Name: Selmet F006 Delisting
Project No: 108.00256.00029 PO No:
Collected by: Tyler Weber
State Collected: OR ☑ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 18032116
Temperature on Receipt:
Custody Seal: Y [✓ N] - N/A
Notes:
Shipped Via: Client - SLR
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn, Zirconium	TCLP - V	TCLP-Mo	Requested Tests								Comments
1	Period 1 Filter Press Cake	3/22/18	1110	SL	2	✓	H*	⊗	⊛									*Hold All TCLP Tests
2																		⊗ Added 4/5/18 [illegible]
3																		⊛ Added 5/18/18 FC
4																		
5																		
6																		
7																		
8																		
9																		
10																		

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☑ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 3-23-18 1115
Received x Date/Time

Relinquished x Date/Time
Received x Date/Time 3-23-18 11:15

www.specialtyanalytical.com

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 03, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1804152

Specialty Analytical received 1 sample(s) on 3/23/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804152**
Date: **5/3/2018**

CLIENT: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029

This sample was hand delivered by the client on 3/23/2018 at 11:15.

Notes relating to quality control samples:

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

RMI flags reported on QC in this batch reflect RPD results outside control limits due to matrix interference.

SMC flags reported on QC in this batch reflect results where the sample concentration is greater than 4x the spiked value. The spiked value is considered insignificant compared to the sample concentration. LCS values in this batch are within range.

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

HT flags reported in this batch reflect that samples were analyzed outside of recommended holding time at client’s request.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Specialty Analytical

Date Reported: **03-May-18**

CLIENT: SLR International Corp.
Collection Date: 3/22/2018 11:10:00 AM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1804152-001
Client Sample ID: Period 1 Filter Press Cake
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **JRC**
Percent Moisture	58.9	0	HT	wt%	1	4/11/2018 4:30:00 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **JRC**
Cadmium	341	223		µg/Kg-dry	10	4/25/2018 10:56:32 AM
Chromium	80900	2230		µg/Kg-dry	10	4/25/2018 10:56:32 AM
Manganese	70600	1120		µg/Kg-dry	10	4/25/2018 10:56:32 AM
Molybdenum	345000	22300		µg/Kg-dry	200	4/30/2018 11:21:36 AM
Nickel	50200	1120		µg/Kg-dry	10	4/25/2018 10:56:32 AM
Silver	41700	223		µg/Kg-dry	10	4/25/2018 10:56:32 AM
Vanadium	2750000	112000		µg/Kg-dry	1000	4/25/2018 11:54:52 AM
CYANIDE		**SW9012B**				Analyst: **jtt**
Cyanide, Total	18.8	0.487	HT	mg/Kg-dry	10	4/25/2018 2:34:12 PM
HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **jtt**
Chromium, Hexavalent	62300	5.14		µg/Kg-dry	10	4/20/2018 3:08:07 PM
FLUORIDE IN SOLIDS		**E 340.2**				Analyst: **ajr**
Fluoride	255	18.2		mg/Kg-dry	10	4/18/2018 10:30:00 AM

QC SUMMARY REPORT

WO#: **1804152**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25637**

Client ID: **ICV** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343830**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	5290	10.0	5000	0	106	90	110				
Chromium	4970	100	5000	0	99.3	90	110				
Manganese	5040	50.0	5000	0	101	90	110				
Molybdenum	4970	50.0	5000	0	99.4	90	110				
Nickel	5090	50.0	5000	0	102	90	110				
Silver	5270	10.0	5000	0	105	90	110				
Vanadium	4930	50.0	5000	0	98.6	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25637**

Client ID: **CCV** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343831**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	4830	10.0	5000	0	96.7	90	110				
Chromium	4970	100	5000	0	99.4	90	110				
Manganese	4930	50.0	5000	0	98.7	90	110				
Molybdenum	4530	50.0	5000	0	90.6	90	110				
Nickel	4910	50.0	5000	0	98.1	90	110				
Silver	4880	10.0	5000	0	97.5	90	110				
Vanadium	4930	50.0	5000	0	98.6	90	110				

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **MB-11740** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **PBS** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343835**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	10.0									
Chromium	ND	100									
Manganese	ND	50.0									
Molybdenum	ND	50.0									
Nickel	ND	50.0									
Silver	ND	10.0									
Vanadium	ND	50.0									

Sample ID **LCS-11740** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **LCSS** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343836**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	4040	10.0	5000	0	80.7	80	120				
Chromium	4720	100	5000	0	94.3	80	120				
Manganese	4710	50.0	5000	0	94.1	80	120				
Molybdenum	4240	50.0	5000	0	84.9	79.8	145				
Nickel	4600	50.0	5000	0	91.9	80	120				
Silver	4460	10.0	5000	0	89.1	12.3	165				
Vanadium	4650	50.0	5000	0	93.1	86	115				

Qualifiers:

B Analyte detected in the associated Method Blank

O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded

R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit

S Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **1804152-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343838**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	281	221						341.4	19.5	20	
Chromium	79400	2210						80910	1.93	20	
Manganese	72200	1110						70590	2.29	20	
Nickel	47600	1110						50160	5.30	20	
Silver	36700	221						41740	13.0	20	

Sample ID **1804152-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343839**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	11300	235	11740	341.4	93.6	70	130				
Chromium	86400	2350	11740	80910	46.7	70	130				SMI
Manganese	81400	1170	11740	70590	92.2	70	130				
Nickel	58900	1170	11740	50160	74.4	70	130				
Silver	46300	235	11740	41740	38.8	70	130				SMI

Sample ID **1804152-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	10500	224	11210	341.4	90.6	70	130	11330	7.60	20	
Chromium	83800	2240	11210	80910	25.7	70	130	86390	3.06	20	SMI
Manganese	78700	1120	11210	70590	72.8	70	130	81410	3.33	20	

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **1804152-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**
Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nickel	57600	1120	11210	50160	66.0	70	130	58890	2.29	20	SMI
Silver	48200	224	11210	41740	57.9	70	130	46290	4.10	20	SMI

Sample ID **1804152-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**
Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343865**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	2800000	111000						3030000	7.86	20	

Sample ID **1804152-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**
Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343866**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	2830000	117000	11740	3030000	-1710	70	130				SMC

Sample ID **1804152-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**
Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/25/2018** SeqNo: **343867**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	2790000	112000	11210	3030000	-2100	70	130	3141000	11.7	20	SMC

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804152**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25637**

Client ID: **ICV** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/30/2018** SeqNo: **344733**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	4900	50.0	5000	0	98.1	90	110				

Sample ID **1804152-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/30/2018** SeqNo: **344735**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	325000	22100						344700	5.93	20	

Sample ID **1804152-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/30/2018** SeqNo: **344736**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	356000	23500	11740	344700	96.0	70	130				

Sample ID **1804152-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/23/2018** RunNo: **25637**

Client ID: **Period 1 Filter Pres** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/30/2018** SeqNo: **344737**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	318000	22400	11210	344700	-236	70	130	356000	11.2	20	SMC

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804152**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25637**

Client ID: **CCV** Batch ID: **11740** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/30/2018** SeqNo: **344738**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	4980	50.0	5000	0	99.5	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **CN_S**

Sample ID **LCS-R25642**	SampType: **LCS**	TestCode: **CN_S**	Units: **mg/Kg**	Prep Date:	RunNo: **25642**
Client ID: **LCSS**	Batch ID: **R25642**	TestNo: **SW9012B**		Analysis Date: **4/25/2018**	SeqNo: **343941**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.0568	0.0200	0.05000	0	114	85	115				

Sample ID **MB-R25642**	SampType: **MBLK**	TestCode: **CN_S**	Units: **mg/Kg**	Prep Date:	RunNo: **25642**
Client ID: **PBS**	Batch ID: **R25642**	TestNo: **SW9012B**		Analysis Date: **4/25/2018**	SeqNo: **343942**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0200									

Sample ID **1804152-001AMS**	SampType: **MS**	TestCode: **CN_S**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **25642**
Client ID: **Period 1 Filter Pres**	Batch ID: **R25642**	TestNo: **SW9012B**		Analysis Date: **4/25/2018**	SeqNo: **343944**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	21.2	0.487	2.433	18.78	100	80	120				HT

Sample ID **1804152-001AMSD**	SampType: **MSD**	TestCode: **CN_S**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **25642**
Client ID: **Period 1 Filter Pres**	Batch ID: **R25642**	TestNo: **SW9012B**		Analysis Date: **4/25/2018**	SeqNo: **343945**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	21.8	0.487	2.433	18.78	125	80	120	21.23	2.78	20	SMCHT

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **CN_S**

Sample ID **R25642CCV** SampType: **CCV** TestCode: **CN_S** Units: **mg/Kg** Prep Date: RunNo: **25642**

Client ID: **CCV** Batch ID: **R25642** TestNo: **SW9012B** Analysis Date: **4/25/2018** SeqNo: **343946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.0753	0.0200	0.07500	0	100	90	110				

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **Cr6_S**

Sample ID **R25590ICV** SampType: **ICV** TestCode: **Cr6_S** Units: **µg/Kg** Prep Date: RunNo: **25590**
Client ID: **ICV** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343378**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	50.6	0.200	50.00	0	101	90	110				

Sample ID **MB-11744** SampType: **MBLK** TestCode: **Cr6_S** Units: **µg/Kg** Prep Date: **4/19/2018** RunNo: **25590**
Client ID: **PBS** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343379**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.200									

Sample ID **LCS-11744** SampType: **LCS** TestCode: **Cr6_S** Units: **µg/Kg** Prep Date: **4/19/2018** RunNo: **25590**
Client ID: **LCSS** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343380**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	48.1	0.200	50.00	0	96.1	80	120				

Sample ID **LCSD-11744** SampType: **LCSD** TestCode: **Cr6_S** Units: **µg/Kg** Prep Date: **4/19/2018** RunNo: **25590**
Client ID: **LCSS02** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343381**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	49.7	0.200	50.00	0	99.5	80	120	48.06	3.44	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **Cr6_S**

Sample ID **1804152-001ADUP** SampType: **DUP** TestCode: **Cr6_S** Units: **µg/Kg-dry** Prep Date: **4/19/2018** RunNo: **25590**

Client ID: **Period 1 Filter Pres** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343383**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	74300	4.96						62340	17.6	20	

Sample ID **1804152-001AMS** SampType: **MS** TestCode: **Cr6_S** Units: **µg/Kg-dry** Prep Date: **4/19/2018** RunNo: **25590**

Client ID: **Period 1 Filter Pres** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343384**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	53600	4.89	122.3	62340	-7130	75	125				SMC

Sample ID **1804152-001AMSD** SampType: **MSD** TestCode: **Cr6_S** Units: **µg/Kg-dry** Prep Date: **4/19/2018** RunNo: **25590**

Client ID: **Period 1 Filter Pres** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343385**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	44400	5.06	126.6	62340	-14200	75	125	53620	18.8	20	SMC

Sample ID **1804171-002ADUP** SampType: **DUP** TestCode: **Cr6_S** Units: **µg/Kg** Prep Date: **4/19/2018** RunNo: **25590**

Client ID: **ZZZZZZ** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343387**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	83700	3.94						87530	4.49	20	

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804152**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029

TestCode: **Cr6_S**

Sample ID **1804171-002ATRIP** SampType: **DUP** TestCode: **CR6_S** Units: **µg/Kg** Prep Date: **4/19/2018** RunNo: **25590**

Client ID: **ZZZZZZ** Batch ID: **11744** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/20/2018** SeqNo: **343388**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	86800	1.95						87530	0.874	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804152**

Specialty Analytical

17-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **FL_S**

Sample ID **CCV 15** SampType: **CCV** TestCode: **FL_S** Units: **mg/Kg** Prep Date: RunNo: **25570**
Client ID: **CCV** Batch ID: **R25570** TestNo: **E 340.2** Analysis Date: **4/18/2018** SeqNo: **343141**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	47.8	0.750	45.00	0	106	90	110				

Sample ID **CCV 15** SampType: **CCV** TestCode: **FL_S** Units: **mg/Kg** Prep Date: RunNo: **25570**
Client ID: **CCV** Batch ID: **R25570** TestNo: **E 340.2** Analysis Date: **4/18/2018** SeqNo: **343142**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	47.8	0.750	45.00	0	106	90	110				

Sample ID **LCS 10** SampType: **LCS** TestCode: **FL_S** Units: **mg/Kg** Prep Date: RunNo: **25570**
Client ID: **LCSS** Batch ID: **R25570** TestNo: **E 340.2** Analysis Date: **4/18/2018** SeqNo: **343143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	34.2	0.750	30.00	0	114	85	115				

Sample ID **LCSD 10** SampType: **LCSD** TestCode: **FL_S** Units: **mg/Kg** Prep Date: RunNo: **25570**
Client ID: **LCSS02** Batch ID: **R25570** TestNo: **E 340.2** Analysis Date: **4/18/2018** SeqNo: **343144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	34.4	0.750	30.00	0	115	85	115	34.21	0.430	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **FL_S**

Sample ID **MBLK** SampType: **MBLK** TestCode: **FL_S** Units: **mg/Kg** Prep Date: RunNo: **25570**
Client ID: **PBS** Batch ID: **R25570** TestNo: **E 340.2** Analysis Date: **4/18/2018** SeqNo: **343146**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.750									

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/19/2018 10:00:5**
Prep End Date: **4/23/2018 11:58:4**

Prep Factor Units: **mL / g**

Prep Batch ID **11744** Prep Code **CR6PR** Method No Technician **Jacob Tietsort**

Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
1804152-001A	Period 1 Filter Press	Solid			1.184	0	0	50	42.230	4/19/2018	4/23/2018
1804152-001ADUP		Solid			1.2269	0	0	50	40.753	4/19/2018	4/23/2018
1804152-001AMS		Solid			1.243	0	0	50	40.225	4/19/2018	4/23/2018
1804152-001AMSD		Solid			1.2013	0	0	50	41.622	4/19/2018	4/23/2018
1804171-002A	SPEI-003 (Cr6-S)	Unknown			1.2984	0	0	50	38.509	4/19/2018	4/23/2018
1804171-002ADUP		Unknown			1.2676	0	0	50	39.445	4/19/2018	4/23/2018
1804171-002ATRIP					1.28	0	0	50	39.063	4/19/2018	4/23/2018
MB-11744		Soil			1.25	0	0	50	40.000	4/19/2018	4/23/2018
LCS-11744		Soil			1.25	0	0	50	40.000	4/19/2018	4/23/2018
LCSD-11744		Soil			1.25	0	0	50	40.000	4/19/2018	4/23/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/23/2018 10:25:3**
Prep End Date: **4/25/2018 7:28:13**

Prep Factor Units: **mL / g**

Prep Batch ID **11740** Prep Code **3050_MS** Method No **3050** Technician **Julie Clay**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11740		Soil			0.5	0	0	50	100.000	4/23/2018	4/23/2018
LCS-11740		Soil			0.5	0	0	50	100.000	4/23/2018	4/23/2018
1804152-001A	Period 1 Filter Press	Solid			0.5454	0	0	50	91.676	4/23/2018	4/23/2018
1804152-001ADUP		Solid			0.5504	0	0	50	90.843	4/23/2018	4/23/2018
1804152-001AMS		Solid			0.5182	0	0	50	96.488	4/23/2018	4/23/2018
1804152-001AMSD		Solid			0.5425	0	0	50	92.166	4/23/2018	4/23/2018
1804193-001A	100-2-042218	Unknown			0.5013	0	0	50	99.741	4/23/2018	4/25/2018
1804196-001A	Metal Scale Mud	Soil			0.5157	0	0	50	96.956	4/23/2018	4/25/2018
1804197-001A	Dust Filter Sample	Soil			0.5173	0	0	50	96.656	4/23/2018	4/25/2018
1804195-001A	Oily Waste Tank	Liquid			0.5044	0	0	50	99.128	4/23/2018	4/25/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR International Corporation
Address: 1800 Blankenship Rd, Suite 440
City, State, Zip: West Linn, OR, 97068
Telephone: 503-723-4423
Invoice To:

Date: 3/23/2018 Page: 1 of: 1
Project Name: Selmet F006 Delisting
Project No: 108.00256.00029 PO No:
Collected by: Tyler Weber
State Collected: OR ☑ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 1804152
Temperature on Receipt:
Custody Seal: Y / [✓ N] - N/A
Notes:
Shipped Via: Client . Follow Up Test from 1803216 - SLZ
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

						Requested Tests												
	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	Total Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn	TCLP Vanadium										Comments
1	Period 1 Filter Press Cake	3/22/2018	1110	SL	2	✓	✓	✓										
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 3-23-18 / 1115
Received x Date/Time 3-23-18 11:15
Relinquished x Date/Time
Received x Date/Time

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APPENDIX E

FILTER PRESS CAKE PERIOD 2 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD

ESC LAB SCIENCES
a subsidiary of Pace Analytical

myESC REAL TIME DATA ACCESS
a subsidiary of Pace Analytical

ANALYTICAL REPORT

April 11, 2018

Selmet, Inc

Sample Delivery Group:	L983055
Samples Received:	04/04/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting
Report To:	Tyler Weber 33992 SE Seven Mile Lane Albany, OR 97322

Entire Report Reviewed By: Brian Ford

Brian Ford
Technical Service Representative

TABLE OF CONTENTS

PERIOD 2 FILTER PRESS CAKE L983055-01 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/02/18 13:00	04/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1095509	1	04/09/18 12:09	04/09/18 12:19	JD
Wet Chemistry by Method 7199	WG1094717	10	04/10/18 13:28	04/10/18 21:06	MCG
Wet Chemistry by Method 9012B	WG1094646	1	04/06/18 19:17	04/09/18 09:32	KK
Wet Chemistry by Method 9056A	WG1095088	5	04/08/18 11:14	04/09/18 16:54	DR
Metals (ICP) by Method 6010B	WG1093988	10	04/05/18 11:19	04/06/18 11:23	TRB

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	41.7		1	04/09/2018 12:19	WG1095509

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	8.33	J	6.11	24.0	10	04/10/2018 21:06	WG1094717

Sample Narrative:

L983055-01 WG1094717: Diluted due to matrix interference

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	2.04		0.0935	0.599	1	04/09/2018 09:32	WG1094646

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	612		3.12	12.0	5	04/09/2018 16:54	WG1095088

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cadmium	U		1.68	12.0	10	04/06/2018 11:23	WG1093988
Chromium	83.1		3.36	24.0	10	04/06/2018 11:23	WG1093988
Manganese	53.8		2.88	24.0	10	04/06/2018 11:23	WG1093988
Molybdenum	316		3.83	12.0	10	04/06/2018 11:23	WG1093988
Nickel	62.8		11.7	47.9	10	04/06/2018 11:23	WG1093988
Silver	U		6.71	24.0	10	04/06/2018 11:23	WG1093988
Vanadium	3560		5.75	47.9	10	04/06/2018 11:23	WG1093988

WG1095509

Total Solids by Method 2540 G-2011

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3300352-1 04/09/18 12:19

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L983038-04 Original Sample (OS) • Duplicate (DUP)

(OS) L983038-04 04/09/18 12:19 • (DUP) R3300352-3 04/09/18 12:19

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	81.7	82.1	1	0.466		5

Laboratory Control Sample (LCS)

(LCS) R3300352-2 04/09/18 12:19

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3300641-1 04/10/18 20:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L983286-01 Original Sample (OS) • Duplicate (DUP)

(OS) L983286-01 04/10/18 20:35 • (DUP) R3300641-4 04/10/18 20:41

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.391	0.716	1	58.8	J P1	20

L983291-04 Original Sample (OS) • Duplicate (DUP)

(OS) L983291-04 04/10/18 23:20 • (DUP) R3300641-8 04/10/18 23:26

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	0.549	0.562	1	2.25	J	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300641-2 04/10/18 20:13 • (LCSD) R3300641-3 04/10/18 20:19

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	10.0	8.97	9.15	89.7	91.5	80.0-120			1.99	20

L983286-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983286-06 04/10/18 21:38 • (MS) R3300641-5 04/10/18 21:44 • (MSD) R3300641-6 04/10/18 21:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	0.737	17.8	18.2	85.1	87.4	1	75.0-125			2.55	20

L983286-06 Original Sample (OS) • Matrix Spike (MS)

(OS) L983286-06 04/10/18 21:38 • (MS) R3300641-7 04/10/18 21:56

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	1250	0.737	1000	80.0	50	75.0-125	

Method Blank (MB)

(MB) R3300082-1 04/09/18 09:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.0390	0.250

L983024-06 Original Sample (OS) • Duplicate (DUP)

(OS) L983024-06 04/09/18 09:22 • (DUP) R3300082-4 04/09/18 09:23

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	U	0.000	1	0.000		20

L983024-10 Original Sample (OS) • Duplicate (DUP)

(OS) L983024-10 04/09/18 09:28 • (DUP) R3300082-5 04/09/18 09:31

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	U	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300082-2 04/09/18 09:07 • (LCSD) R3300082-3 04/09/18 09:08

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.42	2.47	96.7	98.7	50.0-150			2.05	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3300077-1 04/08/18 15:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Fluoride	U		0.261	1.00

L983707-02 Original Sample (OS) • Duplicate (DUP)

(OS) L983707-02 04/08/18 18:58 • (DUP) R3300077-4 04/08/18 19:19

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
		mg/kg		%		%
Fluoride		2.63	1	17.3	P1	15

L983711-04 Original Sample (OS) • Duplicate (DUP)

(OS) L983711-04 04/08/18 23:09 • (DUP) R3300077-7 04/08/18 23:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
		mg/kg		%		%
Fluoride		5.03	1	26.6	J3	15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300077-2 04/08/18 16:11 • (LCSD) R3300077-3 04/08/18 16:32

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Fluoride	20.0	20.3	20.7	101	103	80.0-120			2.02	15

L983707-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983707-03 04/08/18 20:22 • (MS) R3300077-5 04/08/18 20:43 • (MSD) R3300077-6 04/08/18 21:04

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg		mg/kg	mg/kg	%	%		%			%	%
Fluoride	50.0		41.1	43.8	72.7	78.1	1	80.0-120	J6	J6	6.39	15

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3299536-1 04/06/18 03:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Silver	U		0.280	1.00
Vanadium	U		0.240	2.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3299536-2 04/06/18 03:42 • (LCSD) R3299536-3 04/06/18 03:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cadmium	100	98.5	103	98.5	103	80.0-120			4.32	20
Chromium	100	96.1	101	96.1	101	80.0-120			5.06	20
Manganese	100	94.7	99.8	94.7	99.8	80.0-120			5.24	20
Molybdenum	100	102	107	102	107	80.0-120			4.92	20
Nickel	100	95.4	101	95.4	101	80.0-120			5.74	20
Silver	20.0	17.7	18.8	88.7	93.8	80.0-120			5.57	20
Vanadium	100	96.9	103	96.9	103	80.0-120			5.90	20

L983021-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983021-01 04/06/18 03:49 • (MS) R3299536-6 04/06/18 03:59 • (MSD) R3299536-7 04/06/18 04:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	100	ND	95.0	94.9	94.8	94.6	1	75.0-125			0.169	20
Chromium	100	16.9	101	103	84.6	85.7	1	75.0-125			1.11	20
Manganese	100	981	835	913	0.000	0.000	1	75.0-125	V	V	8.91	20
Molybdenum	100	ND	91.0	90.5	90.8	90.2	1	75.0-125			0.564	20
Nickel	100	14.7	110	111	94.9	96.3	1	75.0-125			1.30	20
Silver	20.0	ND	17.2	17.4	86.2	86.9	1	75.0-125			0.785	20
Vanadium	100	25.4	112	114	86.9	88.2	1	75.0-125			1.13	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana [1]	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	n/a
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T 104704245-17-14
Texas [5]	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

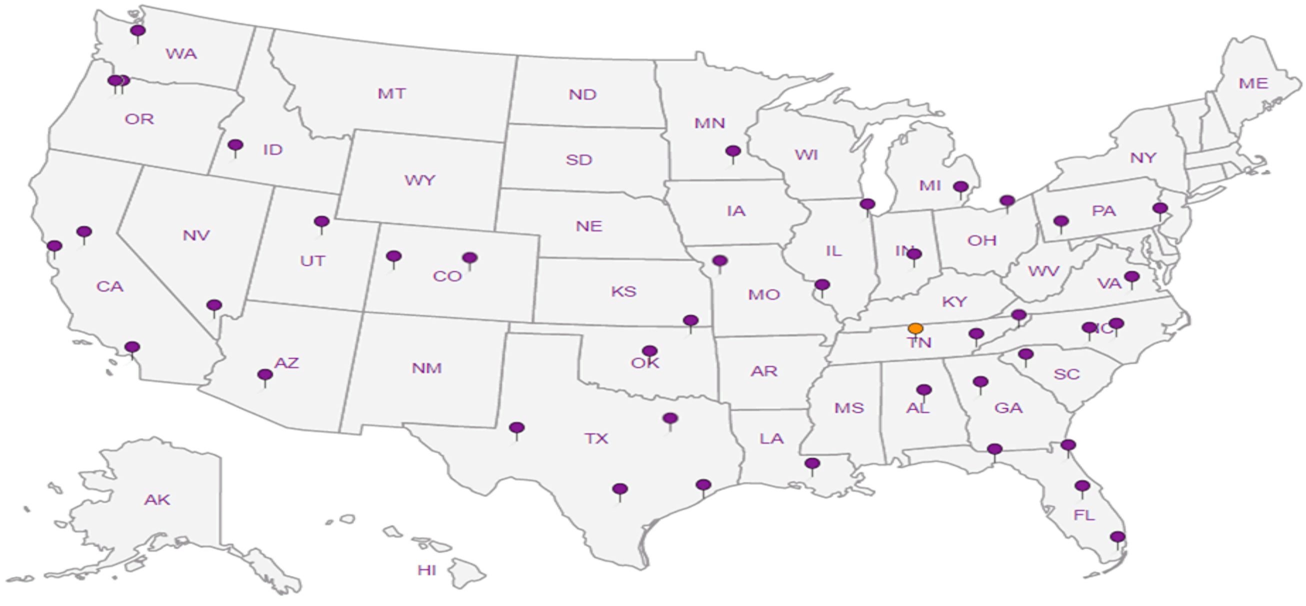
A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003

AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SLR International Corp
1800 Blankenship Road, Suite 440
West Linn, OR 97068

Alternate billing information:
Accounts Payable
P.O. Box 689
Albany, OR 97321

Report to: Tyler Weber

Email to: tweber@slrconsulting.com

Chain of Custody
Page 1 of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Project Description: Selmet F006 Delisting

City/State Collected: Albany, OR

Phone: (503) 723-4423
FAX:

Client Project #: 108.00256.00029

ESC Key:

Collected by: Tyler Weber

Site/Facility ID#:

P.O.#:

Collected by (signature):

Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
____ Same Day.......200%
____ Next Day........100%
____ Five Day.........25%

Date Results Needed:
Email? __No__Yes
FAX? __No__Yes

Analysis/Container/Preservative

CoCode SLRWLOR (lab use only)
Template/Prelogin
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Cyanide, F, Cr6IC 8ozClr-No Pres	Total Metals* 2ozClr - No Pres						Remarks/Contaminant	Sample # (lab only)
Period 2 Filter Press Cake	Comp	SS	~	4/2/2018	13:00	2	X	X							983055-01

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other______

E008

pH ________ Temp ________

Flow ________ Other ________

Remarks: * Total metals include - Cadmium, Chromium, Molybdenum, Nickel, Silver, Vanadium, and Manganese

Relinquished by: (Signature)	Date: 4/2/2016	Time: 1700	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.1	Bottles Received: 2
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) 600	Date: 4/4/18	Time: 845
				pH Checked:	NCF:

6051 2430 7078

ESC LAB SCIENCES
Cooler Receipt Form

Client: SCRWLor SDG# 983055

Cooler Received/Opened On: 4/4 /18 Temperature: 0.1

Received By: Christian Kacar

Signature:

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 21, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1804002

Specialty Analytical received 1 sample(s) on 4/2/2018 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804002**
Date: **5/21/2018**

CLIENT: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029

Notes relating to quality control samples:

B flags reported on QC in this batch reflect results where the sample has a concentration greater then ten times the hit in the method blank. This hit is considered insignificant in relation to the concentration of the sample.

SMC flags reported on QC in this batch reflect results where the sample concentration is greater than 4x the spiked value. The spiked value is considered insignificant compared to the sample concentration. LCS values in this batch are within range.

Revision 1-

This report has been revised to include the following analyses per client request: Cadmium, Chromium, Manganese, Molybdenum, Nickel, Silver, Vanadium, Cyanide, Fluoride and Hexavalent Chromium.

Revision 2-

Upon review this report was revised to correct the % moisture content. The correct RL for Total Zirconium has been added.

Revision 3-

This report has been revised to add prep batch reports.

Revision 4-

This report has been revised to include values for TCLP Cd and Mo per client request.

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp.

Collection Date: 4/2/2018 1:00:00 PM

Project: Selmet F006 Delisting / 108.00256.00029

Lab ID: 1804002-001

Client Sample ID: Period 2 Filter Press Cake

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **JRC**
Percent Moisture	55.7	0		wt%	1	4/11/2018 4:30:00 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	1150000	21900		µg/Kg-dry	100	4/9/2018 11:31:49 AM
TCLP METALS ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Cadmium, TCLP	ND	5.00		µg/L	10	4/25/2018 12:25:15 PM
Molybdenum, TCLP	25.4	25.0		µg/L	10	5/21/2018 11:11:04 AM
Vanadium, TCLP	29.3	25.0		µg/L	10	4/25/2018 12:25:15 PM

QC SUMMARY REPORT

WO#: **1804002**

Specialty Analytical

21-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25417**
Client ID: **ICV** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341360**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5250	100	5000	0	105	90	110				B

Sample ID **MB-11668** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25417**
Client ID: **PBS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341361**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	456	100									

Sample ID **LCS-11668** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25417**
Client ID: **LCSS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341362**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4930	100	5000	0	98.6	80	120				B

Sample ID **1804002-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25417**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341364**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1120000	21000						1150000	2.38	20	

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804002**

21-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **1804002-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25417**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341365**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1170000	22900	11470	1150000	133	70	130				SMC

Sample ID **1804002-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25417**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341366**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1150000	22600	11280	1150000	-11.1	70	130	1165000	1.42	20	SMC

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25417**

Client ID: **CCV** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/9/2018** SeqNo: **341367**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4770	100	5000	0	95.3	90	110				B

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343188**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	51.2	0.100	50.00	0	102	90	110				
Vanadium, TCLP	47.3	0.500	50.00	0	94.6	90	110				

Sample ID **MB-11729** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **PBW** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343189**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	0.100									
Vanadium, TCLP	ND	0.500									

Sample ID **LCS-11729** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **LCSW** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343190**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	51.5	0.100	50.00	0	103	80	120				
Vanadium, TCLP	46.6	0.500	50.00	0	93.2	80	120				

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/20/2018** SeqNo: **343207**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	51.9	0.100	50.00	0	104	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/20/2018** SeqNo: **343207**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **CCV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343214**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	50.9	0.100	50.00	0	102	90	110				
Vanadium, TCLP	50.0	0.500	50.00	0	100	90	110				

Sample ID **A1804157-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343216**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	1.00						0	0	20	RF
Vanadium, TCLP	14.2	5.00						15.26	7.26	20	

Sample ID **A1804157-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343217**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	42.4	1.00	50.00	0.4695	83.9	70	130				
Vanadium, TCLP	67.1	5.00	50.00	15.26	104	70	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **A1804157-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/19/2018** SeqNo: **343218**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	41.8	1.00	50.00	0.4695	82.7	70	130	42.41	1.39	20	
Vanadium, TCLP	66.3	5.00	50.00	15.26	102	70	130	67.14	1.29	20	

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/25/2018** SeqNo: **343899**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	52.9	0.100	50.00	0	106	90	110				
Vanadium, TCLP	49.3	0.500	50.00	0	98.6	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **CCV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/25/2018** SeqNo: **343900**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	49.2	0.100	50.00	0	98.4	90	110				
Vanadium, TCLP	48.7	0.500	50.00	0	97.5	90	110				

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348233**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	47.6	0.500	50.00	0	95.3	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **ICV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348233**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID **MB-11729** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **PBW** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348241**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	ND	0.500									

Sample ID **LCS-11729** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**

Client ID: **LCSW** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348242**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	46.4	0.500	50.00	0	92.8	80	120				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**

Client ID: **CCV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348244**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	45.7	0.500	50.00	0	91.3	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804002**

Specialty Analytical

21-May-18

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029
TestCode: **6020_TCLP**

Sample ID **A1804157-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**
Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348246**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	298	5.00						294.7	0.959	20	

Sample ID **A1804157-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**
Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348247**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	348	5.00	50.00	294.7	107	70	130				

Sample ID **A1804157-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/19/2018** RunNo: **25571**
Client ID: **ZZZZZZ** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348248**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	349	5.00	50.00	294.7	109	70	130	348.3	0.318	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25571**
Client ID: **CCV** Batch ID: **11729** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	45.1	0.500	50.00	0	90.1	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Date: 4/2/18 Page: 1 of: 1

Laboratory Project No (internal): 1804002

Client: SLR

Address: 1800 Blankenship Rd, Ste 440

City, State, Zip: West Linn, OR 97068

Telephone: 503-723-4427

Invoice To:

Project Name: Selmet FOGG Delisting

Project No: PO No:

Collected by: Tyler Weber

State Collected: OR ☒ WA ☐ OTHER

Report To (PM): Tyler Weber

PM Email: tweber@slrconsulting.com

Temperature on Receipt: Amb

Custody Seal: [✓ Y] N

Notes: Seals intact

Shipped Via: Client - SLR

Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

					Requested Tests												
Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn, Zirconium		Cd, Cr, Mn, Mo, Ni, Ag, V	Cyanide, Total	Fluoride	Hex Chrom						Comments
1 Period 2 Filter Press Cake	4/2/18	1300	SL	2	✓	H*		⊗	⊗	⊗	⊗						Hold All TCLP Tests
2																	
3																	⊗ Additional Testing Per
4																	Client Request 4/27/18
5																	KD 4/27/18
6																	
7																	
8																	
9																	
10																	

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4/2/18 15:10
Received x Date/Time 4/2/18 15:10

Relinquished x Date/Time
Received x Date/Time

www.specialtyanalytical.com

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 04, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1805035

Specialty Analytical received 1 sample(s) on 5/3/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1805035**
Date: **5/4/2018**

CLIENT: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029

Notes relating to quality control samples:

B flags reported on QC in this batch reflect results where the sample has a concentration greater then ten times the hit in the method blank. This hit is considered insignificant in relation to the concentration of the sample.

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

SMC flags reported on QC in this batch reflect results where the sample concentration is greater than 4x the spiked value. The spiked value is considered insignificant compared to the sample concentration. LCS values in this batch are within range.

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

RMI flags reported on QC in this batch reflect RPD results outside control limits due to matrix interference.

HT flags reported in this batch reflect that samples were analyzed outside of recommended holding time at client’s request.

Q flags reported in this batch reflect elevated detection levels due to sample matrix.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Specialty Analytical

Date Reported: **04-May-18**

CLIENT: SLR International Corp.

Collection Date: 4/2/2018 1:00:00 PM

Project: Selmet F006 Delisting / 108.00256.00029

Lab ID: 1805035-001

Client Sample ID: Period 2 Filter Press Cake

Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **JRC**
Percent Moisture	55.7	0		wt%	1	4/11/2018 4:30:00 PM
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **ajr**
Fluoride	134	1.69		mg/Kg-dry	1	4/30/2018 10:41:00 AM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **JRC**
Cadmium	400	219		µg/Kg-dry	10	5/2/2018 3:12:16 PM
Chromium	84300	21900		µg/Kg-dry	100	5/2/2018 2:21:00 PM
Manganese	63900	11000		µg/Kg-dry	100	5/2/2018 2:21:00 PM
Molybdenum	345000	11000		µg/Kg-dry	100	5/2/2018 2:21:00 PM
Nickel	57100	11000		µg/Kg-dry	100	5/2/2018 2:21:00 PM
Silver	34500	2190		µg/Kg-dry	100	5/2/2018 2:21:00 PM
Vanadium	3710000	110000		µg/Kg-dry	1000	5/2/2018 2:58:46 PM
CYANIDE		**SW9012B**				Analyst: **jtt**
Cyanide, Total	2.57	0.451	HT	mg/Kg-dry	1	5/4/2018 11:06:35 AM
HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **jtt**
Chromium, Hexavalent	ND	9.03	QHT	mg/Kg-dry	20	4/30/2018 2:03:59 PM

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25740**

Client ID: **ICV** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345073**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	5080	10.0	5000	0	102	90	110				
Chromium	4960	100	5000	0	99.2	90	110				
Manganese	4940	50.0	5000	0	98.7	90	110				
Molybdenum	4980	50.0	5000	0	99.6	90	110				B
Nickel	5000	50.0	5000	0	100	90	110				
Silver	4760	10.0	5000	0	95.3	90	110				B
Vanadium	4930	50.0	5000	0	98.7	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25740**

Client ID: **CCV** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345075**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	4500	50.0	5000	0	90.1	90	110				B

Sample ID **MB-11668** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **PBS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345076**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	10.0									
Chromium	ND	100									
Manganese	ND	50.0									
Molybdenum	79.2	50.0									
Nickel	ND	50.0									

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **MB-11668** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **PBS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345076**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Silver	18.3	10.0									
Vanadium	ND	50.0									

Sample ID **1805035-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	90600	21000						84300	7.25	20	
Manganese	100000	10500						63930	44.2	20	RMI
Molybdenum	346000	10500						345000	0.168	20	
Nickel	65200	10500						57100	13.2	20	
Silver	36500	2100						34460	5.65	20	

Sample ID **LCS-11668** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **LCSS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	4350	10.0	5000	0	87.0	80	120				
Chromium	5410	100	5000	0	108	80	120				
Manganese	5450	50.0	5000	0	109	80	120				
Molybdenum	5270	50.0	5000	0	105	79.8	145				B
Nickel	5330	50.0	5000	0	107	80	120				
Silver	4670	10.0	5000	0	93.3	12.3	165				B

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **LCS-11668** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **LCSS** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	5400	50.0	5000	0	108	86	115				

Sample ID **1805035-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345080**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	85400	22900	11470	84300	9.77	70	130				SMC
Manganese	193000	11500	11470	63930	1130	70	130				SMC
Molybdenum	332000	11500	11470	345000	-113	70	130				SMC
Nickel	57700	11500	11470	57100	5.55	70	130				SMC
Silver	33600	2290	11470	34460	-7.97	70	130				SMC

Sample ID **1805035-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345081**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	85800	22600	11280	84300	13.5	70	130	85420	0.466	20	SMC
Manganese	67800	11300	11280	63930	34.6	70	130	193000	96.0	20	SRMC
Molybdenum	349000	11300	11280	345000	32.4	70	130	332100	4.87	20	SMC
Nickel	58900	11300	11280	57100	16.0	70	130	57740	2.00	20	SMC
Silver	41900	2260	11280	34460	66.4	70	130	33550	22.2	20	SRMC

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_S**

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25740**

Client ID: **CCV** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	5110	10.0	5000	0	102	90	110				
Chromium	4950	100	5000	0	99.0	90	110				
Manganese	5020	50.0	5000	0	100	90	110				
Molybdenum	4530	50.0	5000	0	90.5	90	110				B
Nickel	5080	50.0	5000	0	102	90	110				
Silver	4800	10.0	5000	0	96.0	90	110				B
Vanadium	4990	50.0	5000	0	99.8	90	110				

Sample ID **1805035-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345115**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	4040000	105000						3710000	8.62	20	

Sample ID **1805035-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**

Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345116**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	4060000	115000	11470	3710000	3080	70	130				SMC

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **1805035-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345117**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vanadium	4000000	113000	11280	3710000	2540	70	130	4063000	1.65	20	SMC

Sample ID **1805035-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345119**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	414	210						400.2	3.47	20	

Sample ID **1805035-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345120**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	13300	229	11470	400.2	113	70	130				

Sample ID **1805035-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/9/2018** RunNo: **25740**
Client ID: **Period 2 Filter Pres** Batch ID: **11668** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/2/2018** SeqNo: **345121**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	12600	226	11280	400.2	108	70	130	12610	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805035**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **CCV**		SampType: **CCV**	TestCode: **6020_S**	Units: **µg/Kg**		Prep Date:			RunNo: **25740**		
Client ID: **CCV**		Batch ID: **11668**	TestNo: **SW6020A**	**SW3050B**		Analysis Date: **5/2/2018**			SeqNo: **345122**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	5280	10.0	5000	0	106	90	110				
Vanadium	5130	50.0	5000	0	103	90	110				

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **CN_S**

Sample ID **11825-ICV** SampType: **ICV** TestCode: **CN_S** Units: **mg/Kg** Prep Date: RunNo: **25774**

Client ID: **ICV** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345433**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.0492	0.0200	0.05000	0	98.4	90	110				

Sample ID **MB-R25774** SampType: **MBLK** TestCode: **CN_S** Units: **mg/Kg** Prep Date: RunNo: **25774**

Client ID: **PBS** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345434**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0200									

Sample ID **LCS-R25774** SampType: **LCS** TestCode: **CN_S** Units: **mg/Kg** Prep Date: RunNo: **25774**

Client ID: **LCSS** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345435**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.102	0.0200	0.1000	0	102	85	115				

Sample ID **1805035-001AMS** SampType: **MS** TestCode: **CN_S** Units: **mg/Kg-dry** Prep Date: RunNo: **25774**

Client ID: **Period 2 Filter Pres** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345437**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	2.84	0.451	0.5643	2.571	48.3	80	120				SMCHT

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **CN_S**

Sample ID **1805035-001AMSD** SampType: **MSD** TestCode: **CN_S** Units: **mg/Kg-dry** Prep Date: RunNo: **25774**

Client ID: **Period 2 Filter Pres** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345438**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	2.71	0.451	0.5643	2.571	25.3	80	120	2.844	4.68	20	SMCHT

Sample ID **11825-CCV** SampType: **CCV** TestCode: **CN_S** Units: **mg/Kg** Prep Date: RunNo: **25774**

Client ID: **CCV** Batch ID: **R25774** TestNo: **SW9012B** Analysis Date: **5/4/2018** SeqNo: **345439**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.0754	0.0200	0.07500	0	101	90	110				

QC SUMMARY REPORT

WO#: **1805035**

Specialty Analytical

17-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029

TestCode: **Cr6_S**

Sample ID **MB-11835** SampType: **MBLK** TestCode: **Cr6_S** Units: **mg/Kg** Prep Date: **4/27/2018** RunNo: **25778**

Client ID: **PBS** Batch ID: **11835** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/30/2018** SeqNo: **345499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.200									

Sample ID **LCS-11835** SampType: **LCS** TestCode: **Cr6_S** Units: **mg/Kg** Prep Date: **4/27/2018** RunNo: **25778**

Client ID: **LCSS** Batch ID: **11835** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/30/2018** SeqNo: **345500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	42.2	0.200	40.00	0	105	80	120				

Sample ID **LCSD-11835** SampType: **LCSD** TestCode: **Cr6_S** Units: **mg/Kg** Prep Date: **4/27/2018** RunNo: **25778**

Client ID: **LCSS02** Batch ID: **11835** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/30/2018** SeqNo: **345501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	41.3	0.200	40.00	0	103	80	120	42.17	2.01	20	

Sample ID **1805035-001ADUP** SampType: **DUP** TestCode: **Cr6_S** Units: **mg/Kg-dry** Prep Date: **4/27/2018** RunNo: **25778**

Client ID: **Period 2 Filter Pres** Batch ID: **11835** TestNo: **SW7196A** **SW 3060A** Analysis Date: **4/30/2018** SeqNo: **345503**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	9.03						0	0	20	QHT

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **Cr6_S**

Sample ID **1805035-001AMS**	SampType: **MS**	TestCode: **Cr6_S**	Units: **mg/Kg-dry**		Prep Date: **4/27/2018**			RunNo: **25778**				
Client ID: **Period 2 Filter Pres**	Batch ID: **11835**	TestNo: **SW7196A**	**SW 3060A**		Analysis Date: **4/30/2018**			SeqNo: **345504**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Chromium, Hexavalent	ND	9.03	112.9	0	0	75	125				SMIHT	

Sample ID **1805035-001AMSD**	SampType: **MSD**	TestCode: **Cr6_S**	Units: **mg/Kg-dry**		Prep Date: **4/27/2018**			RunNo: **25778**			
Client ID: **Period 2 Filter Pres**	Batch ID: **11835**	TestNo: **SW7196A**	**SW 3060A**		Analysis Date: **4/30/2018**			SeqNo: **345505**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	9.03	112.9	0	0	75	125	0	0	20	SMIHT

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805035**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** IC_S

Sample ID **A1804216-002EDUP** SampType: **DUP** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**

Client ID: **ZZZZZZ** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345235**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.750						0	0	20	RF

Sample ID **A1804216-002EMS** SampType: **MS** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**

Client ID: **ZZZZZZ** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345236**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	28.6	0.750	30.00	0.1600	94.7	75	125				

Sample ID **A1804216-002EMSD** SampType: **MSD** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**

Client ID: **ZZZZZZ** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345237**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	30.1	0.750	30.00	0.1600	99.7	75	125	28.57	5.13	20	

Sample ID **CCV 15** SampType: **CCV** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**

Client ID: **CCV** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345238**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	48.4	0.750	45.00	0	108	90	110				

Qualifiers:

B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

S Spike Recovery outside accepted reco

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **IC_S**

Sample ID **CCV 15** SampType: **CCV** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**
Client ID: **CCV** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345239**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	43.8	0.750	45.00	0	97.4	90	110				

Sample ID **LCS 10** SampType: **LCS** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**
Client ID: **LCSS** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345240**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	29.9	0.750	30.00	0	99.8	85	115				

Sample ID **LCSD 10** SampType: **LCSD** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**
Client ID: **LCSS02** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345241**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	29.9	0.750	30.00	0	99.5	85	115	29.95	0.287	20	

Sample ID **LOW CHK 0.25** SampType: **ICV** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**
Client ID: **ICV** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345242**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.750	0.7500	0	95.9	70	130				

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

Specialty Analytical

WO#: **1805035**
17-May-18

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **IC_S**

Sample ID **MBLK** SampType: **MBLK** TestCode: **IC_S** Units: **mg/Kg** Prep Date: RunNo: **25748**
Client ID: **PBS** Batch ID: **11823** TestNo: **SW9056** **SW9056PR** Analysis Date: **4/30/2018** SeqNo: **345243**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.750									

Qualifiers:					
B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/27/2018 10:00:3**
Prep End Date: **5/4/2018 11:41:50**

Prep Factor Units:
mL / g

Prep Batch ID **11835** Prep Code **CR6PR** Method No Technician **Jacob Tietsort**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11835		Soil			1.25	0	0	50	40.000	4/27/2018	5/4/2018
LCS-11835		Soil			1.25	0	0	50	40.000	4/27/2018	5/4/2018
LCSD-11835		Soil			1.25	0	0	50	40.000	4/27/2018	5/4/2018
1805035-001A	Period 2 Filter Press	Solid			1.25	0	0	50	40.000	4/27/2018	5/4/2018
1805035-001ADUP		Solid			1.25	0	0	50	40.000	4/27/2018	5/4/2018
1805035-001AMS		Solid			1.25	0	0	50	40.000	4/27/2018	5/4/2018
1805035-001AMSD		Solid			1.25	0	0	50	40.000	4/27/2018	5/4/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/27/2018 9:19:00**
Prep End Date: **4/27/2018 9:19:00**

Prep Factor Units: **mL / g**

Prep Batch ID **11823** Prep Code **IC_SPR** Method No Technician **A.J. Riddell**

Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
1804002-001A	Period 2 Filter Press	Solid			10	0	0	30	3.000	4/27/2018	4/27/2018
MB-11823		Soil			10	0	0	30	3.000	4/27/2018	4/27/2018
1805035-001A	Period 2 Filter Press	Solid			10	0	0	30	3.000	4/27/2018	4/27/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/9/2018 7:20:45 A**
Prep End Date: **4/9/2018 11:00:45**

Prep Factor Units:
mL / g

Prep Batch ID **11668** Prep Code **3050_MS** Method No **3050** Technician **Ben Walker**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11668		Soil			0.5	0	0	50	100.000	4/9/2018	4/9/2018
LCS-11668		Soil			0.5	0	0	50	100.000	4/9/2018	4/9/2018
1804002-001A	Period 2 Filter Press	Solid			0.5149	0	0	50	97.106	4/9/2018	4/9/2018
1804002-001ADUP		Solid			0.5382	0	0	50	92.902	4/9/2018	4/9/2018
1804002-001AMS		Solid			0.4921	0	0	50	101.605	4/9/2018	4/9/2018
1804002-001AMSD		Solid			0.5005	0	0	50	99.900	4/9/2018	4/9/2018
1805035-001A	Period 2 Filter Press	Solid			0.5149	0	0	50	97.106	4/9/2018	4/9/2018
1805035-001ADUP		Solid			0.5382	0	0	50	92.902	4/9/2018	4/9/2018
1805035-001AMS		Solid			0.4921	0	0	50	101.605	4/9/2018	4/9/2018
1805035-001AMSD		Solid			0.5005	0	0	50	99.900	4/9/2018	4/9/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR
Address: 1800 Blankenship Rd, Ste 440
City, State, Zip: West Linn, OR 97068
Telephone: 503-723-4423
Invoice To:

Date: 4/2/18 Page: 1 of: 1
Project Name: Selmet FOGG Delisting
Project No: PO No:
Collected by: Tyler Weber
State Collected: OR ☒ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 1804002
Temperature on Receipt: Amb
Custody Seal: [✓ Y] N
Notes: Seals intact
Shipped Via: Client - SLR
Sample Disposal: ☐ Return to client ☒ Disposal by lab (after 60 days)

Requested Tests

Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn, Zirconium		Cd, Cr, Mn, Mo, Ni, Ag, V	Cyanide, Total	Fluoride	Hex Chrom						Comments
1 Period 2 Filter Press Cake	4/2/18	1300	SL	2	✓	H*		⊗	⊗	⊗	⊗						Hold All TCLP Tests
2																	
3																	⊗ Additional Testing Per
4																	Client Request 4/27/18
5																	KL 4/27/18
6																	
7																	
8																	
9																	
10																	

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4/2/18 15:10 Received x Date/Time 4/2/18 15:10
Relinquished x Date/Time Received x Date/Time

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APPENDIX F

FILTER PRESS CAKE PERIOD 3 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD

ANALYTICAL REPORT

April 24, 2018

Selmet, Inc

Sample Delivery Group:	L985817
Samples Received:	04/14/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting
Report To:	Tyler Weber 33992 SE Seven Mile Lane Albany, OR 97322

Entire Report Reviewed By: Brian Ford

Brian Ford
Technical Service Representative

TABLE OF CONTENTS

PERIOD 3 FILTER PRESS CAKE L985817-01 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/12/18 13:20	04/14/18 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1099014	1	04/17/18 13:32	04/17/18 13:49	JD
Wet Chemistry by Method 7199	WG1097962	1	04/15/18 14:01	04/16/18 20:15	MCG
Wet Chemistry by Method 9012B	WG1101060	1	04/23/18 09:05	04/23/18 12:51	KK
Wet Chemistry by Method 9056A	WG1097872	5	04/16/18 15:53	04/17/18 11:45	MAJ
Metals (ICP) by Method 6010B	WG1099139	10	04/17/18 17:27	04/18/18 14:38	CCE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	45.4		1	04/17/2018 13:49	WG1099014

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	17.2		0.562	2.20	1	04/16/2018 20:15	WG1097962

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	1.23		0.0860	0.551	1	04/23/2018 12:51	WG1101060

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	388		2.87	11.0	5	04/17/2018 11:45	WG1097872

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cadmium	U		1.54	11.0	10	04/18/2018 14:38	WG1099139
Chromium	145		3.09	22.0	10	04/18/2018 14:38	WG1099139
Manganese	71.9		2.64	22.0	10	04/18/2018 14:38	WG1099139
Molybdenum	236		3.53	11.0	10	04/18/2018 14:38	WG1099139
Nickel	57.1		10.8	44.1	10	04/18/2018 14:38	WG1099139
Silver	U		6.17	22.0	10	04/18/2018 14:38	WG1099139
Vanadium	3350		5.29	44.1	10	04/18/2018 14:38	WG1099139

Method Blank (MB)

(MB) R3302661-1 04/17/18 13:49

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L985842-01 Original Sample (OS) • Duplicate (DUP)

(OS) L985842-01 04/17/18 13:49 • (DUP) R3302661-3 04/17/18 13:49

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	75.3	76.0	1	0.943		5

Laboratory Control Sample (LCS)

(LCS) R3302661-2 04/17/18 13:49

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3302379-1 04/16/18 19:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L984685-01 Original Sample (OS) • Duplicate (DUP)

(OS) L984685-01 04/16/18 21:04 • (DUP) R3302379-7 04/16/18 21:11

	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	U	0.414	1	200	J P1	20

L985938-07 Original Sample (OS) • Duplicate (DUP)

(OS) L985938-07 04/16/18 23:12 • (DUP) R3302379-8 04/16/18 23:19

	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	2.02	1.28	1	45.1	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302379-2 04/16/18 19:42 • (LCSD) R3302379-3 04/16/18 19:48

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Hexavalent Chromium	10.0	9.67	9.73	96.7	97.3	80.0-120			0.620	20

L985817-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985817-01 04/16/18 20:15 • (MS) R3302379-4 04/16/18 20:22 • (MSD) R3302379-5 04/16/18 20:28

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	44.1	17.2	53.2	53.7	81.6	82.8	1	75.0-125			0.986	20

Method Blank (MB)

(MB) R3303916-1 04/23/18 12:44

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Cyanide	U		0.0390	0.250

L986741-15 Original Sample (OS) • Duplicate (DUP)

(OS) L986741-15 04/23/18 12:54 • (DUP) R3303916-7 04/23/18 13:22

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Cyanide	ND	0.000	1	0.000		20

L987444-01 Original Sample (OS) • Duplicate (DUP)

(OS) L987444-01 04/23/18 13:41 • (DUP) R3303916-10 04/23/18 13:42

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Cyanide	U	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303916-2 04/23/18 12:45 • (LCSD) R3303916-3 04/23/18 12:47

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Cyanide	2.50	2.45	2.42	97.8	96.9	50.0-150			0.951	20

L986854-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986854-03 04/23/18 13:24 • (MS) R3303916-8 04/23/18 13:25 • (MSD) R3303916-9 04/23/18 13:26

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Cyanide	2.04	U	1.36	1.04	66.6	51.0	1	75.0-125	J6	J3 J6	26.5	20

Method Blank (MB)

(MB) R3302500-1 04/16/18 18:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Fluoride	U		0.261	1.00

L985173-02 Original Sample (OS) • Duplicate (DUP)

(OS) L985173-02 04/16/18 22:50 • (DUP) R3302500-4 04/16/18 23:10

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	11.3	63.9	1	140	J3	15

L985499-01 Original Sample (OS) • Duplicate (DUP)

(OS) L985499-01 04/17/18 06:09 • (DUP) R3302500-7 04/17/18 06:30

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	17.2	17.3	1	0.649		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302500-2 04/16/18 18:50 • (LCSD) R3302500-3 04/16/18 19:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluoride	20.0	19.7	20.0	98.3	99.8	80.0-120			1.46	15

L985478-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985478-01 04/17/18 02:40 • (MS) R3302500-5 04/17/18 03:01 • (MSD) R3302500-6 04/17/18 03:21

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	60.3	34.3	58.8	56.4	40.6	36.7	1	80.0-120	J6	J6	4.06	15

Method Blank (MB)

(MB) R3302880-1 04/18/18 12:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Silver	U		0.280	1.00
Vanadium	U		0.240	2.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302880-2 04/18/18 12:48 • (LCSD) R3302880-3 04/18/18 12:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cadmium	100	98.1	101	98.1	101	80.0-120			2.62	20
Chromium	100	101	104	101	104	80.0-120			2.74	20
Manganese	100	98.9	101	98.9	101	80.0-120			2.62	20
Molybdenum	100	105	108	105	108	80.0-120			2.28	20
Nickel	100	102	104	102	104	80.0-120			2.44	20
Silver	20.0	19.1	19.6	95.3	97.9	80.0-120			2.78	20
Vanadium	100	103	105	103	105	80.0-120			2.07	20

L986114-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986114-01 04/18/18 12:55 • (MS) R3302880-6 04/18/18 13:04 • (MSD) R3302880-7 04/18/18 13:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	100	ND	99.0	96.4	99.0	96.4	1	75.0-125			2.70	20
Chromium	100	6.41	110	106	104	99.6	1	75.0-125			3.95	20
Manganese	100	133	315	495	183	362	1	75.0-125	J5	J3 J5	44.3	20
Molybdenum	100	9.06	122	110	113	101	1	75.0-125			9.78	20
Nickel	100	14.5	136	128	122	113	1	75.0-125			6.59	20
Silver	20.0	ND	18.8	18.6	94.0	93.1	1	75.0-125			1.06	20
Vanadium	100	24.2	139	129	115	105	1	75.0-125			6.99	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

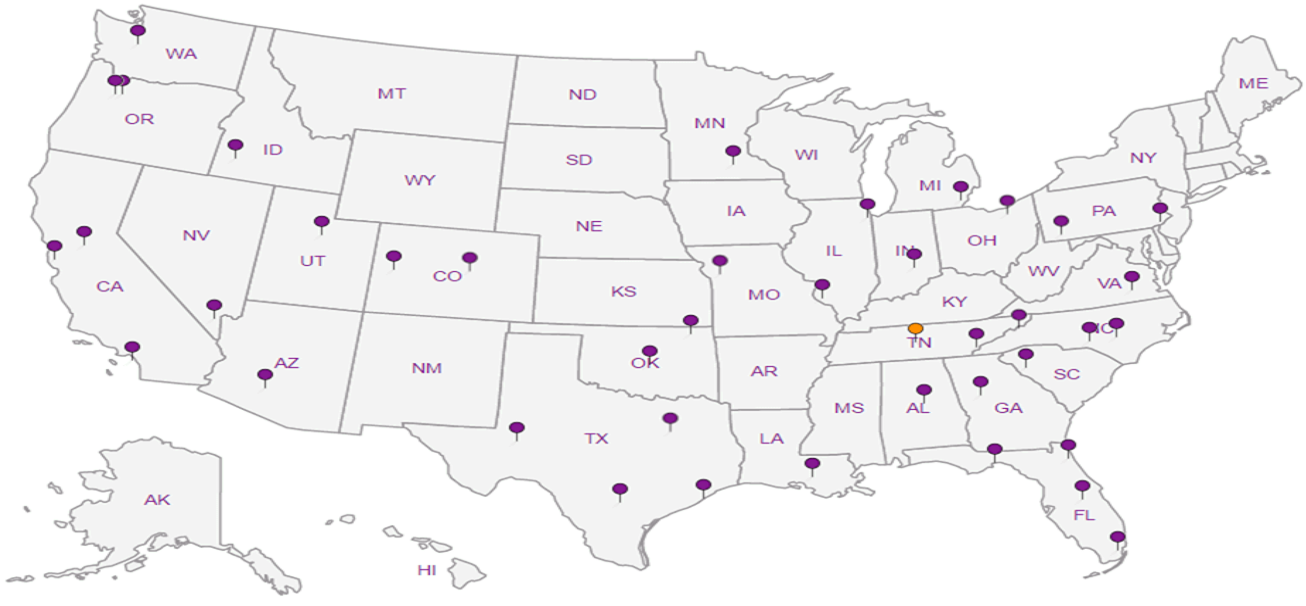
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



G135

SLR International Corp
1800 Blankenship Road, Suite 440
West Linn, OR 97068

Alternate billing information:
Accounts Payable
P.O. Box 689
Albany, OR 97321

Report to: Tyler Weber

Email to: tweber@slrconsulting.com

Chain of Custody Page 1 of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122

Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Project Description: Selmet F006 Delisting

City/State Collected: Albany, OR

Phone: (503) 723-4423

FAX:

Client Project #: 108.00256.00029

ESC Key:

Collected by: Tyler Weber

Site/Facility ID#:

P.O.#:

Collected by (signature):

Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
_____ Same Day.......200%
_____ Next Day.......100%
_____ Five Day.......25%

Date Results Needed:
Email? __No__Yes
FAX? __No__Yes

CoCode SLRWLOR (lab use only)

Template/Prelogin

Shipped Via:

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Cyanide, F, Cr6lC 8ozClr-No Pres	Total Metals* 2ozClr - No Pres							Remarks/Contaminant	Sample # (lab only)
Period 3 Filter Press Cake	Comp	SS	–	4/12/18	1320	2	X	X								L985817-01

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other__________

Remarks: * Total metals include - Cadmium, Chromium, Molybdenum, Nickel, Silver, Vanadium, and Manganese

7466 1466 7835

pH __________ Temp __________

Flow __________ Other __________

Relinquished by: (Signature) Date: 4/12/18 Time: 20:15

Received by: (Signature)

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ______

Condition: (lab use only) LOCSI

Relinquished by: (Signature) Date: Time:

Received by: (Signature)

Temp: 4.1 $\frac{MO}{10}$

Bottles Received: 2

Relinquished by: (Signature) Date: Time:

Received for lab by: (Signature) 904

Date: 4/14/18

Time: 9:00

pH Checked:

NCF:

ESC LAB SCIENCES

Cooler Receipt Form

Client: SLRWLOR

SDG# 985817

Cooler Received/Opened On: 4/ 14/18

Temperature: 4.1

Received By: Kelsey Rish

Signature:

Receipt Check List	**NP**	**Yes**	**No**
COC Seal Present / Intact? AV 4/24/18	~~✓~~	✓	
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 21, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting

Dear Tyler Weber: Order No.: 1804112

Specialty Analytical received 1 sample(s) on 4/13/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804112**

Date: **5/21/2018**

CLIENT: SLR International Corp.

Project: Selmet F006 Delisting

This sample was hand delivered by the client on 4/13/2018 at 12:22.

Notes relating to quality control samples:

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

Revision 1-

This report has been revised in order to correct the units for TCLP Chromium and Vanadium.

Revision 2-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Revision 3-

This report has been revised to include values for TCLP Cd & Mo per client request.

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp.
Collection Date: 4/12/2018 1:20:00 PM
Project: Selmet F006 Delisting
Lab ID: 1804112-001
Client Sample ID: Period 3 Filter Press Cake
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	46.7	0		wt%	1	4/16/2018 3:00:13 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	880000	17300		µg/Kg-dry	100	4/18/2018 9:22:56 AM
TCLP METALS ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **JRC**
Cadmium, TCLP	ND	5.00		µg/L	10	4/27/2018 5:13:40 PM
Chromium, TCLP	ND	5.00		µg/L	10	4/27/2018 5:13:40 PM
Molybdenum, TCLP	100	25.0		µg/L	10	5/21/2018 11:09:13 AM
Vanadium, TCLP	ND	25.0		µg/L	10	4/27/2018 5:13:40 PM

QC SUMMARY REPORT

WO#: **1804112**

Specialty Analytical

21-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**

Client ID: **ICV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342906**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5180	100	5000	0	104	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**

Client ID: **CCV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4960	100	5000	0	99.3	90	110				

Sample ID **LCS-11716** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**

Client ID: **LCSS** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4920	100	5000	0	98.4	80	120				

Sample ID **1804137-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**

Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	ND	960						0	0	20	RF

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804112**
21-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting
TestCode: **6020_S**

Sample ID **1804137-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**
Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342911**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	6410	925	4626	145.6	136	70	130				SMI

Sample ID **1804137-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**
Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342912**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5750	943	4715	145.6	119	70	130	6415	10.9	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**
Client ID: **CCV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342915**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4770	100	5000	0	95.4	90	110				

Sample ID **MB-11716** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**
Client ID: **PBS** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	ND	100									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804112**

21-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_S**

Sample ID **CCV**	SampType: **CCV**	TestCode: **6020_S**	Units: **µg/Kg**	Prep Date:			RunNo: **25542**				
Client ID: **CCV**	Batch ID: **11716**	TestNo: **SW6020A**	**SW3050B**	Analysis Date: **4/18/2018**			SeqNo: **342920**				

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4800	100	5000	0	96.1	90	110				

Qualifiers:	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804112**

Specialty Analytical

21-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **ICV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344557**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	51.2	0.100	50.00	0	102	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Vanadium, TCLP	49.6	0.500	50.00	0	99.2	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344560**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Chromium, TCLP	48.2	0.100	50.00	0	96.5	90	110				
Vanadium, TCLP	48.1	0.500	50.00	0	96.2	90	110				

Sample ID **MB-11781** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **PBW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344561**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Vanadium, TCLP	ND	0.500									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804112**
21-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting **TestCode:** **6020_TCLP**

Sample ID **LCS-11781** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **LCSW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344562**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	46.7	0.100	50.00	0	93.5	80	120				
Chromium, TCLP	49.6	0.100	50.00	0	99.2	80	120				
Vanadium, TCLP	49.6	0.500	50.00	0	99.2	80	120				

Sample ID **1805036-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344564**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	5.00						0	0	20	R
Chromium, TCLP	60.3	5.00						63.23	4.80	20	

Sample ID **1805036-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344565**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	236	5.00	250.0	0.8364	94.1	70	130				
Chromium, TCLP	305	5.00	250.0	63.23	96.5	70	130				

Sample ID **1805036-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344566**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting

TestCode: **6020_TCLP**

Sample ID **1805036-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344566**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	235	5.00	250.0	0.8364	93.7	70	130	236.1	0.454	20	
Chromium, TCLP	309	5.00	250.0	63.23	98.3	70	130	304.6	1.44	20	

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **ICV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348257**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	47.6	0.500	50.00	0	95.3	90	110				

Sample ID **MB-11781** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **PBW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348258**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	ND	0.500									

Sample ID **LCS-11781** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **LCSW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348259**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	51.4	0.500	50.00	0	103	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

Specialty Analytical

WO#: **1804112**
21-May-18

Client: SLR International Corp.
Project: Selmet F006 Delisting
TestCode: **6020_TCLP**

Sample ID **1805036-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348261**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	29.4	25.0						50.95	53.5	20	RF

Sample ID **1805036-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348262**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	290	25.0	250.0	50.95	95.6	70	130				

Sample ID **1805036-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **ZZZZZZ** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348263**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	289	25.0	250.0	50.95	95.2	70	130	290.0	0.345	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**
Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348265**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum, TCLP	45.7	0.500	50.00	0	91.3	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Date: 4/12/18
Page: 1 of: 1
Laboratory Project No (internal): 1804112
Project Name: Selmet F006 Delisting
Temperature on Receipt:
Client: SLR
Project No:
PO No:
Custody Seal: Y [✓ N] -N/A
Address: 1800 Blankenship Rd, STE 440
Collected by: Tyler Weber
Notes:
City, State, Zip: West Linn, OR 97068
State Collected: OR ☒ WA ☐ OTHER
Shipped Via: Client -SLR
Telephone: 503-723-4423
Report To (PM): Tyler Weber
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)
Invoice To: Selmet
PM Email: tweber@slrconsulting.com

					Requested Tests												
Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn, Zirconium											Comments
1 Period 3 Filter Press Cake	4/12/18	13:20	SL	2	✓	H*											Hold All TCLP Tests
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x
Date/Time 4-12-18 / 20:00
Received x
Date/Time

Relinquished x
Date/Time
Received x
Date/Time 4/13/18 12:22

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APPENDIX G

FILTER PRESS CAKE PERIOD 4 ANALYTICAL RESULTS

Analytical results are included on enclosed Data CD

ANALYTICAL REPORT

May 18, 2018

Selmet, Inc

Sample Delivery Group:	L988246
Samples Received:	04/24/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting
Report To:	Tyler Weber 33992 SE Seven Mile Lane Albany, OR 97322

Entire Report Reviewed By: Brian Ford

Brian Ford
Technical Service Representative

TABLE OF CONTENTS

PERIOD 4 FILTER PRESS CAKE L988246-01 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/20/18 11:15	04/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1103593	1	04/26/18 15:08	04/26/18 15:17	KDW
Wet Chemistry by Method 7199	WG1101979	10	04/24/18 16:56	04/25/18 19:13	GB
Wet Chemistry by Method 9012B	WG1103534	1	04/26/18 22:35	04/27/18 10:05	KK
Wet Chemistry by Method 9056A	WG1105508	5	05/02/18 13:19	05/02/18 16:13	MAJ
Metals (ICP) by Method 6010B	WG1102914	5	04/25/18 18:44	04/26/18 22:30	ST

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	42.1		1	04/26/2018 15:17	WG1103593

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		6.06	23.7	10	04/25/2018 19:13	WG1101979

Sample Narrative:

L988246-01 WG1101979: DILUTION DUE TO MATRIX INTERFERENCE

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	1.82		0.0926	0.594	1	04/27/2018 10:05	WG1103534

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	505		3.09	11.9	5	05/02/2018 16:13	WG1105508

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cadmium	U		0.831	5.94	5	04/26/2018 22:30	WG1102914
Chromium	70.0		1.66	11.9	5	04/26/2018 22:30	WG1102914
Manganese	74.3		1.42	11.9	5	04/26/2018 22:30	WG1102914
Molybdenum	319		1.90	5.94	5	04/26/2018 22:30	WG1102914
Nickel	51.9		5.82	23.7	5	04/26/2018 22:30	WG1102914
Silver	12.9		3.32	11.9	5	04/26/2018 22:30	WG1102914
Vanadium	3060		2.85	23.7	5	04/26/2018 22:30	WG1102914

Sample Narrative:

L988246-01 WG1102914: Post Spike/Serial Dilution Passed for Manganese

Method Blank (MB)

(MB) R3305192-1 04/26/18 15:17

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L988181-01 Original Sample (OS) • Duplicate (DUP)

(OS) L988181-01 04/26/18 15:17 • (DUP) R3305192-3 04/26/18 15:17

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	84.7	83.5	1	1.36		5

Laboratory Control Sample (LCS)

(LCS) R3305192-2 04/26/18 15:17

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3304849-1 04/25/18 15:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L987075-01 Original Sample (OS) • Duplicate (DUP)

(OS) L987075-01 04/25/18 15:31 • (DUP) R3304849-4 04/25/18 15:40

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	1.19	1.46	1	20.2	J P1	20

L987450-03 Original Sample (OS) • Duplicate (DUP)

(OS) L987450-03 04/25/18 19:01 • (DUP) R3304849-10 04/25/18 19:07

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	17.9	19.6	10	8.95	J	20

Sample Narrative:

OS: DILUTION DUE TO MATRIX INTERFERENCE

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304849-2 04/25/18 15:14 • (LCSD) R3304849-3 04/25/18 15:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	10.0	9.11	9.31	91.1	93.1	80.0-120			2.24	20

L987142-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987142-09 04/25/18 16:45 • (MS) R3304849-5 04/25/18 16:51 • (MSD) R3304849-6 04/25/18 16:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	21.9	58.1	99.4	100	189	192	1	75.0-125	E J5	E J5	0.649	20

L987142-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L987142-09 04/25/18 16:45 • (MS) R3304849-7 04/25/18 17:03

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	1130	58.1	761	62.4	50	75.0-125	J6

Method Blank (MB)

(MB) R3305255-1 04/27/18 09:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.0390	0.250

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3305255-2 04/27/18 09:57 • (LCSD) R3305255-3 04/27/18 09:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.53	2.48	101	99.3	50.0-150			1.99	20

Method Blank (MB)

(MB) R3306752-1 05/02/18 15:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Fluoride	U		0.261	1.00

L988507-01 Original Sample (OS) • Duplicate (DUP)

(OS) L988507-01 05/02/18 16:29 • (DUP) R3306752-4 05/02/18 16:44

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	7.86	6.02	1	26.6	J3	15

L988510-03 Original Sample (OS) • Duplicate (DUP)

(OS) L988510-03 05/02/18 23:25 • (DUP) R3306752-9 05/02/18 23:40

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	8.97	9.50	1	5.78		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3306752-2 05/02/18 15:27 • (LCSD) R3306752-3 05/02/18 15:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluoride	20.0	21.7	21.6	108	108	80.0-120			0.652	15

L988510-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L988510-12 05/02/18 20:35 • (MS) R3306752-5 05/02/18 21:22 • (MSD) R3306752-6 05/02/18 21:37

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	62.6	9.17	47.2	45.4	60.8	57.8	1	80.0-120	J6	J6	4.04	15

L988510-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L988510-13 05/02/18 21:52 • (MS) R3306752-7 05/02/18 22:08 • (MSD) R3306752-8 05/02/18 22:23

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Fluoride	64.4	9.48	49.1	48.1	61.5	60.0	1	80.0-120	J6	J6	1.92	15

Method Blank (MB)

(MB) R3305122-1 04/26/18 13:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Silver	U		0.280	1.00
Vanadium	0.256	J	0.240	2.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3305122-2 04/26/18 13:59 • (LCSD) R3305122-3 04/26/18 14:02

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cadmium	100	94.3	94.8	94.3	94.8	80.0-120			0.532	20
Chromium	100	96.0	96.2	96.0	96.2	80.0-120			0.187	20
Manganese	100	94.2	94.7	94.2	94.7	80.0-120			0.559	20
Molybdenum	100	100	100	100	100	80.0-120			0.158	20
Nickel	100	98.5	99.3	98.5	99.3	80.0-120			0.878	20
Silver	20.0	18.9	19.0	94.7	95.2	80.0-120			0.438	20
Vanadium	100	96.9	96.4	96.9	96.4	80.0-120			0.429	20

L988164-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L988164-05 04/26/18 14:06 • (MS) R3305122-6 04/26/18 14:16 • (MSD) R3305122-7 04/26/18 14:19

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	163	11.0	174	166	99.7	95.2	1	75.0-125			4.32	20
Chromium	163	22.8	179	165	96.0	87.6	1	75.0-125			7.95	20
Manganese	163	256	438	320	112	39.4	1	75.0-125		J3 J6	31.2	20
Molybdenum	163	5.44	166	152	98.5	89.7	1	75.0-125			9.04	20
Nickel	163	16.8	189	168	105	92.6	1	75.0-125			11.7	20
Silver	32.6	ND	33.7	31.7	103	97.2	1	75.0-125			6.02	20
Vanadium	163	13.2	167	162	94.6	91.3	1	75.0-125			3.33	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

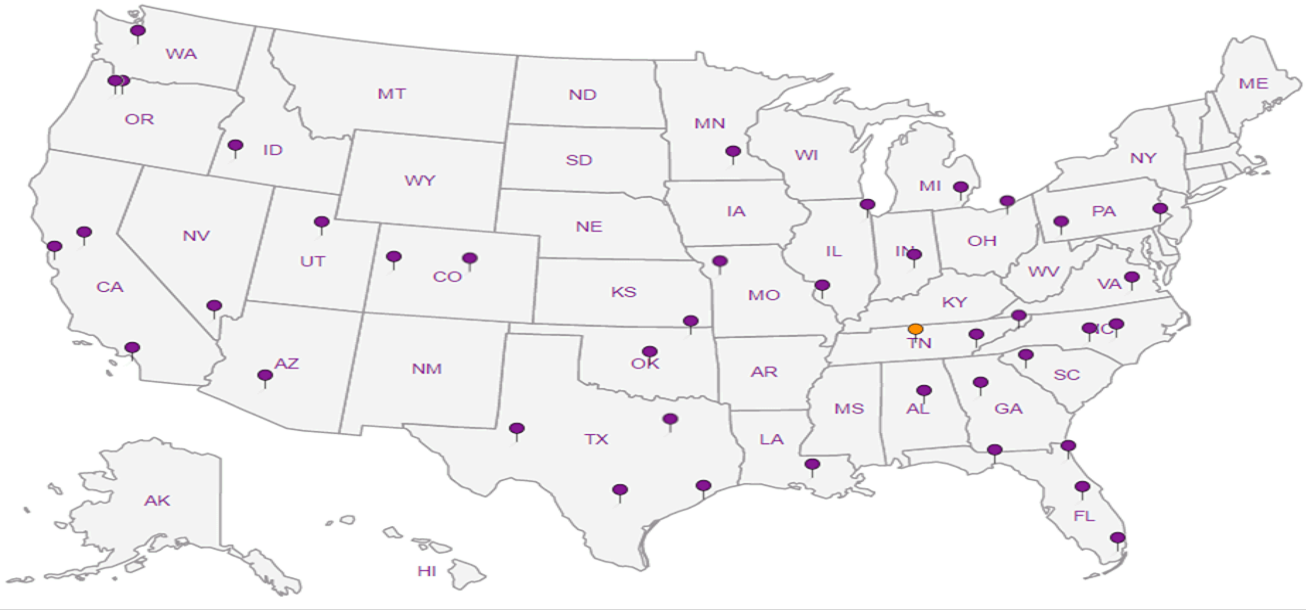
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SLR International Corp
1800 Blankenship Road, Suite 440
West Linn, OR 97068

Alternate billing information:
Accounts Payable
P.O. Box 689
Albany, OR 97321

Report to: Tyler Weber

Email to: tweber@slrconsulting.com

C080

Chain of Custody
_ of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122

Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Project Description: Selmet F006 Delisting

City/State Collected: Albany, OR

Phone: (503) 723-4423
FAX:

Client Project #: 108.00256.00029

ESC Key: —

Collected by: Tyler Weber

Site/Facility ID#:

P.O.#: —

Collected by (signature):

Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
_____ Same Day.......200%
_____ Next Day.......100%
_____ Five Day........25%

Date Results Needed:

Email? __No__Yes
FAX? __No__Yes

Analysis/Container/Preservative

CoCode SLRWLOR (lab use only)
Template/Prelogin L988246
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Cyanide, F, Cr6IC 8ozClr-No Pres	Total Metals* [illegible]Clr - No Pres 8oz TRW						Remarks/Contaminant	Sample # (lab only)
Period 4 Filter Press Cake	Comp	SS	—	11:35	4/20/2018	2	X	X							-01
—															
—															
—															
—															
—															
—															
—															
—															

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_________

Remarks: * Total metals include - Cadmium, Chromium, Molybdenum, Nickel, Silver, Vanadium, and Manganese

pH ____________ Temp ____________

Flow ____________ Other ____________

Relinquished by: (Signature)
Date: 4/23/18
Time: 14:00
Received by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ________

Condition: (lab use only) OK

Relinquished by: (Signature)
Date:
Time:
Received by: (Signature)

Temp: 3.2
Bottles Received: 2x8ozcl

Relinquished by: (Signature)
Date:
Time:
Received for lab by: (Signature)

Date: 4/24/18
Time: 0845

pH Checked:
NCF:

Tracking#: 6200 8042 4026

ESC LAB SCIENCES
Cooler Receipt Form

Client: SLRWLCR

SDG# L988246

Cooler Received/Opened On: 04/24/18

Temperature: 3.2

Received By: Kelly Mercer

Signature:

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?		✓	
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 21, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1804198

Specialty Analytical received 1 sample(s) on 4/23/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804198**

Date: **5/21/2018**

CLIENT: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029

Notes relating to quality control samples:

B flags reported on QC in this batch reflect results where the sample has a concentration greater then ten times the hit in the method blank. This hit is considered insignificant in relation to the concentration of the sample.

RMI flags reported on QC in this batch reflect RPD results outside control limits due to matrix interference.

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Revision 2-

This report has been revised to include values for TCLP Cd & Mo per client request.

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp.
Collection Date: 4/20/2018 11:15:00 AM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1804198-001
Client Sample ID: Period 4 Filter Press Cake
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	56.2	0		wt%	1	4/24/2018 9:00:27 AM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	1380000	21100		µg/Kg-dry	100	5/8/2018 11:12:10 AM
ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Cadmium, TCLP	ND	5.00		µg/L	10	5/7/2018 4:17:02 PM
Molybdenum, TCLP	64.0	25.0		µg/L	10	5/7/2018 4:17:02 PM
Vanadium, TCLP	ND	25.0		µg/L	10	5/7/2018 4:17:02 PM

QC SUMMARY REPORT

WO#: **1804198**
21-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**
Client ID: **ICV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345829**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5230	100	5000	0	105	90	110				B

Sample ID **MB-11771** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/26/2018** RunNo: **25809**
Client ID: **PBS** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345830**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	428	100									

Sample ID **LCS-11771** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/26/2018** RunNo: **25809**
Client ID: **LCSS** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345831**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4650	100	5000	0	93.0	80	120				B

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**
Client ID: **CCV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345839**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4690	100	5000	0	93.8	90	110				B

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_S**

Sample ID **1804173-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/26/2018** RunNo: **25809**

Client ID: **ZZZZZZ** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345842**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1990000	34700	17330	2016000	-165	70	130				SMI

Sample ID **1804173-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/26/2018** RunNo: **25809**

Client ID: **ZZZZZZ** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345843**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1600000	36100	18070	2016000	-2280	70	130	1988000	21.4	20	SRMI

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**

Client ID: **CCV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4510	100	5000	0	90.2	90	110				B

Sample ID **1804173-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg-dry** Prep Date: **4/26/2018** RunNo: **25809**

Client ID: **ZZZZZZ** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	2730000	332000						2016000	30.2	20	RMI

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**

Client ID: **CCV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4780	100	5000	0	95.6	90	110				B

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **ICV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345871**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Molybdenum, TCLP	50.2	0.500	50.00	0	100	90	110				
Vanadium, TCLP	49.2	0.500	50.00	0	98.5	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **CCV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345873**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	52.1	0.100	50.00	0	104	90	110				
Molybdenum, TCLP	48.7	0.500	50.00	0	97.3	90	110				
Vanadium, TCLP	54.0	0.500	50.00	0	108	90	110				

Sample ID **MB-11850** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **PBW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345874**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	0.100									
Molybdenum, TCLP	ND	0.500									
Vanadium, TCLP	ND	0.500									

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804198**

Specialty Analytical

21-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **LCS-11850** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **LCSW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345875**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	53.3	0.100	50.00	0	107	80	120				
Molybdenum, TCLP	43.7	0.500	50.00	0	87.4	80	120				
Vanadium, TCLP	48.6	0.500	50.00	0	97.1	80	120				

Sample ID **1804173-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **ZZZZZZ** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345877**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	ND	5.00						0	0	20	RF
Molybdenum, TCLP	32.3	25.0						84.60	89.5	20	RMI
Vanadium, TCLP	339	25.0						325.3	4.06	20	

Sample ID **1804173-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **ZZZZZZ** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345878**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	274	5.00	250.0	1.051	109	70	130				
Molybdenum, TCLP	257	25.0	250.0	0	103	70	130				
Vanadium, TCLP	607	25.0	250.0	0	243	70	130				SMI

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804198**

Specialty Analytical

21-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **1804173-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **ZZZZZZ** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345879**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium, TCLP	259	5.00	250.0	1.051	103	70	130	273.7	5.41	20	
Molybdenum, TCLP	254	25.0	250.0	0	102	70	130	257.2	1.15	20	
Vanadium, TCLP	607	25.0	250.0	0	243	70	130	607.2	0.0272	20	SMI

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Chain of Custody Record

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Client: SLR International Corporation
Address: 1800 Blankenship Rd, Suite 440
City, State, Zip: West Linn, OR, 97068
Telephone: 503-723-4423
Invoice To: Selmet

Date: 4/23/2018
Page: 1 of: 1
Project Name: Selmet F006 Delisting
Project No: 108.00256.00029 PO No:
Collected by: Tyler Weber
State Collected: OR ☑ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 1804198
Temperature on Receipt: 5.9°C
Custody Seal: [✓ Y] N Intact
Notes:
Shipped Via: Client - SLR
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

					Requested Tests												
Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP Cd, Cr, Hex Cr, Cyanide, Fluoride, Mo, Ni, Ag, V, Mn, Zirconium											Comments
1 Period 4 Filter Press Cake	4/20/2018	1115	SL	2	✓												Hold all TCLP tests for follow-up
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4-23-2018 / 1330
Received x Date/Time 4-23-2018 13:55
Relinquished x Date/Time
Received x Date/Time

www.specialtyanalytical.com

APPENDIX H

EVAPORATION POND SEDIMENT ANLYTICAL RESULTS

Analytical results are included on enclosed Data CD

ANALYTICAL REPORT

April 23, 2018

Selmet, Inc

Sample Delivery Group:	L985823
Samples Received:	04/14/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting
Report To:	Tyler Weber 33992 SE Seven Mile Lane Albany, OR 97322

Entire Report Reviewed By: Brian Ford

Brian Ford
Technical Service Representative

TABLE OF CONTENTS

SAMPLE SUMMARY

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

POND COMPOSITE B L985823-02 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/12/18 16:00	04/14/18 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1099014	1	04/17/18 13:32	04/17/18 13:49	JD
Wet Chemistry by Method 7199	WG1097962	1	04/15/18 14:01	04/16/18 22:26	MCG
Wet Chemistry by Method 9012B	WG1097299	1	04/17/18 10:28	04/17/18 13:04	KK
Wet Chemistry by Method 9056A	WG1099259	100	04/17/18 16:06	04/19/18 13:20	MAJ
Mercury by Method 7471A	WG1099135	1	04/17/18 11:12	04/17/18 22:37	EL
Metals (ICP) by Method 6010B	WG1099139	10	04/17/18 17:27	04/18/18 14:41	CCE
Polychlorinated Biphenyls (GC) by Method 8082	WG1098940	14.7	04/17/18 10:24	04/17/18 17:14	TD
Semi Volatile Organic Compounds (GC/MS) by Method 8270D	WG1098865	14.72	04/16/18 21:54	04/17/18 13:12	CJR
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1099792	15	04/18/18 07:22	04/18/18 16:31	DMG

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	30.3		1	04/17/2018 13:49	WG1099014

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	3.14	J	0.842	3.30	1	04/16/2018 22:26	WG1097962

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	0.376	J	0.129	0.825	1	04/17/2018 13:04	WG1097299

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	5990		86.2	330	100	04/19/2018 13:20	WG1099259

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0287	J	0.00924	0.0660	1	04/17/2018 22:37	WG1099135

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Antimony	U		24.8	66.0	10	04/18/2018 14:41	WG1099139
Arsenic	U		21.5	66.0	10	04/18/2018 14:41	WG1099139
Barium	191		5.61	16.5	10	04/18/2018 14:41	WG1099139
Beryllium	U		2.31	6.60	10	04/18/2018 14:41	WG1099139
Cadmium	U		2.31	16.5	10	04/18/2018 14:41	WG1099139
Chromium	205		4.62	33.0	10	04/18/2018 14:41	WG1099139
Cobalt	U		7.59	33.0	10	04/18/2018 14:41	WG1099139
Copper	44.6	J	17.5	66.0	10	04/18/2018 14:41	WG1099139
Lead	7.01	J	6.27	16.5	10	04/18/2018 14:41	WG1099139
Manganese	273		3.96	33.0	10	04/18/2018 14:41	WG1099139
Molybdenum	84.1		5.28	16.5	10	04/18/2018 14:41	WG1099139
Nickel	50.9	J	16.2	66.0	10	04/18/2018 14:41	WG1099139
Selenium	U		24.4	66.0	10	04/18/2018 14:41	WG1099139
Silver	173		9.24	33.0	10	04/18/2018 14:41	WG1099139
Thallium	U		21.5	66.0	10	04/18/2018 14:41	WG1099139
Vanadium	2160		7.92	66.0	10	04/18/2018 14:41	WG1099139
Zinc	92.9	J	19.5	165	10	04/18/2018 14:41	WG1099139

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.170	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1221	U		0.260	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1232	U		0.202	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1242	U		0.154	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1248	U		0.153	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1254	U		0.229	0.825	14.7	04/17/2018 17:14	WG1098940
PCB 1260	U		0.240	0.825	14.7	04/17/2018 17:14	WG1098940

POND COMPOSITE B

Collected date/time: 04/12/18 16:00

SAMPLE RESULTS - 02

L985823

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
(S) Decachlorobiphenyl	*106*			*10.0-148*		*04/17/2018 17:14*	WG1098940
(S) Tetrachloro-m-xylene	*77.5*			*21.0-146*		*04/17/2018 17:14*	WG1098940

Sample Narrative:

L985823-02 WG1098940: Dilution due to sample volume

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.312	1.60	14.72	04/17/2018 13:12	WG1098865
Acenaphthylene	U		0.326	1.60	14.72	04/17/2018 13:12	WG1098865
Anthracene	U		0.307	1.60	14.72	04/17/2018 13:12	WG1098865
Benzidine	U	J4	3.10	16.2	14.72	04/17/2018 13:12	WG1098865
Benzo(a)anthracene	U		0.208	1.60	14.72	04/17/2018 13:12	WG1098865
Benzo(b)fluoranthene	U		0.337	1.60	14.72	04/17/2018 13:12	WG1098865
Benzo(k)fluoranthene	U		0.283	1.60	14.72	04/17/2018 13:12	WG1098865
Benzo(g,h,i)perylene	U		0.350	1.60	14.72	04/17/2018 13:12	WG1098865
Benzo(a)pyrene	U		0.266	1.60	14.72	04/17/2018 13:12	WG1098865
Bis(2-chlorethoxy)methane	U		0.373	16.2	14.72	04/17/2018 13:12	WG1098865
Bis(2-chloroethyl)ether	U		0.436	16.2	14.72	04/17/2018 13:12	WG1098865
Bis(2-chloroisopropyl)ether	U		0.370	16.2	14.72	04/17/2018 13:12	WG1098865
4-Bromophenyl-phenylether	U		0.555	16.2	14.72	04/17/2018 13:12	WG1098865
2-Chloronaphthalene	U		0.311	1.60	14.72	04/17/2018 13:12	WG1098865
4-Chlorophenyl-phenylether	U		0.305	16.2	14.72	04/17/2018 13:12	WG1098865
Chrysene	U		0.270	1.60	14.72	04/17/2018 13:12	WG1098865
Dibenz(a,h)anthracene	U		0.399	1.60	14.72	04/17/2018 13:12	WG1098865
3,3-Dichlorobenzidine	U		3.86	16.2	14.72	04/17/2018 13:12	WG1098865
2,4-Dinitrotoluene	U		0.295	16.2	14.72	04/17/2018 13:12	WG1098865
2,6-Dinitrotoluene	U		0.357	16.2	14.72	04/17/2018 13:12	WG1098865
Fluoranthene	U		0.241	1.60	14.72	04/17/2018 13:12	WG1098865
Fluorene	U		0.330	1.60	14.72	04/17/2018 13:12	WG1098865
Hexachlorobenzene	U		0.416	16.2	14.72	04/17/2018 13:12	WG1098865
Hexachloro-1,3-butadiene	U		0.485	16.2	14.72	04/17/2018 13:12	WG1098865
Hexachlorocyclopentadiene	U		2.85	16.2	14.72	04/17/2018 13:12	WG1098865
Hexachloroethane	U		0.650	16.2	14.72	04/17/2018 13:12	WG1098865
Indeno(1,2,3-cd)pyrene	U		0.376	1.60	14.72	04/17/2018 13:12	WG1098865
Isophorone	U		0.254	16.2	14.72	04/17/2018 13:12	WG1098865
Naphthalene	U		0.432	1.60	14.72	04/17/2018 13:12	WG1098865
Nitrobenzene	U		0.337	16.2	14.72	04/17/2018 13:12	WG1098865
n-Nitrosodimethylamine	U		3.14	16.2	14.72	04/17/2018 13:12	WG1098865
n-Nitrosodiphenylamine	U		0.289	16.2	14.72	04/17/2018 13:12	WG1098865
n-Nitrosodi-n-propylamine	U		0.439	16.2	14.72	04/17/2018 13:12	WG1098865
Phenanthrene	U		0.257	1.60	14.72	04/17/2018 13:12	WG1098865
Benzylbutyl phthalate	2.62	J	0.502	16.2	14.72	04/17/2018 13:12	WG1098865
Bis(2-ethylhexyl)phthalate	3.11	J	0.584	16.2	14.72	04/17/2018 13:12	WG1098865
Di-n-butyl phthalate	U		0.528	16.2	14.72	04/17/2018 13:12	WG1098865
Diethyl phthalate	U		0.337	16.2	14.72	04/17/2018 13:12	WG1098865
Dimethyl phthalate	U		0.262	16.2	14.72	04/17/2018 13:12	WG1098865
Di-n-octyl phthalate	U		0.442	16.2	14.72	04/17/2018 13:12	WG1098865
Pyrene	U		0.598	1.60	14.72	04/17/2018 13:12	WG1098865
1,2,4-Trichlorobenzene	U		0.426	16.2	14.72	04/17/2018 13:12	WG1098865
4-Chloro-3-methylphenol	U		0.232	16.2	14.72	04/17/2018 13:12	WG1098865
2-Chlorophenol	U		0.403	16.2	14.72	04/17/2018 13:12	WG1098865
2,4-Dichlorophenol	U		0.363	16.2	14.72	04/17/2018 13:12	WG1098865
2,4-Dimethylphenol	U		2.29	16.2	14.72	04/17/2018 13:12	WG1098865
4,6-Dinitro-2-methylphenol	U		6.01	16.2	14.72	04/17/2018 13:12	WG1098865

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2,4-Dinitrophenol	U		4.75	16.2	14.72	04/17/2018 13:12	WG1098865
2-Nitrophenol	U		0.631	16.2	14.72	04/17/2018 13:12	WG1098865
4-Nitrophenol	U		2.55	16.2	14.72	04/17/2018 13:12	WG1098865
Pentachlorophenol	U		2.33	16.2	14.72	04/17/2018 13:12	WG1098865
Phenol	U		0.337	16.2	14.72	04/17/2018 13:12	WG1098865
2,4,6-Trichlorophenol	U		0.380	16.2	14.72	04/17/2018 13:12	WG1098865
(S) 2-Fluorophenol	*52.6*			*20.0-120*		*04/17/2018 13:12*	WG1098865
(S) Phenol-d5	*53.3*			*20.0-120*		*04/17/2018 13:12*	WG1098865
(S) Nitrobenzene-d5	*48.0*			*18.0-125*		*04/17/2018 13:12*	WG1098865
(S) 2-Fluorobiphenyl	*62.9*			*28.0-120*		*04/17/2018 13:12*	WG1098865
(S) 2,4,6-Tribromophenol	*70.7*			*17.0-137*		*04/17/2018 13:12*	WG1098865
(S) p-Terphenyl-d14	*78.9*			*13.0-131*		*04/17/2018 13:12*	WG1098865

Sample Narrative:

L985823-02 WG1098865: Dilution due to sample volume

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Acenaphthene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Acenaphthylene	0.374		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Benzo(a)anthracene	0.0302	B J	0.0297	0.297	15	04/18/2018 16:31	WG1099792
Benzo(a)pyrene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Benzo(b)fluoranthene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Benzo(g,h,i)perylene	0.0510	B J	0.0297	0.297	15	04/18/2018 16:31	WG1099792
Benzo(k)fluoranthene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Chrysene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Dibenz(a,h)anthracene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Fluoranthene	0.0769	B J	0.0297	0.297	15	04/18/2018 16:31	WG1099792
Fluorene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Indeno(1,2,3-cd)pyrene	U		0.0297	0.297	15	04/18/2018 16:31	WG1099792
Naphthalene	U		0.0990	0.990	15	04/18/2018 16:31	WG1099792
Phenanthrene	0.0606	J	0.0297	0.297	15	04/18/2018 16:31	WG1099792
Pyrene	0.0518	J	0.0297	0.297	15	04/18/2018 16:31	WG1099792
1-Methylnaphthalene	U		0.0990	0.990	15	04/18/2018 16:31	WG1099792
2-Methylnaphthalene	U		0.0990	0.990	15	04/18/2018 16:31	WG1099792
2-Chloronaphthalene	U		0.0990	0.990	15	04/18/2018 16:31	WG1099792
(S) Nitrobenzene-d5	*59.9*			*14.0-149*		*04/18/2018 16:31*	WG1099792
(S) 2-Fluorobiphenyl	*94.6*			*34.0-125*		*04/18/2018 16:31*	WG1099792
(S) p-Terphenyl-d14	*87.5*			*23.0-120*		*04/18/2018 16:31*	WG1099792

Sample Narrative:

L985823-02 WG1099792: Dilution due to sample volume

Method Blank (MB)

(MB) R3302661-1 04/17/18 13:49

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L985842-01 Original Sample (OS) • Duplicate (DUP)

(OS) L985842-01 04/17/18 13:49 • (DUP) R3302661-3 04/17/18 13:49

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	75.3	76.0	1	0.943		5

Laboratory Control Sample (LCS)

(LCS) R3302661-2 04/17/18 13:49

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3302379-1 04/16/18 19:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L984685-01 Original Sample (OS) • Duplicate (DUP)

(OS) L984685-01 04/16/18 21:04 • (DUP) R3302379-7 04/16/18 21:11

	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	U	0.414	1	200	J P1	20

L985938-07 Original Sample (OS) • Duplicate (DUP)

(OS) L985938-07 04/16/18 23:12 • (DUP) R3302379-8 04/16/18 23:19

	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	2.02	1.28	1	45.1	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302379-2 04/16/18 19:42 • (LCSD) R3302379-3 04/16/18 19:48

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Hexavalent Chromium	10.0	9.67	9.73	96.7	97.3	80.0-120			0.620	20

L985817-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985817-01 04/16/18 20:15 • (MS) R3302379-4 04/16/18 20:22 • (MSD) R3302379-5 04/16/18 20:28

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	7.82	24.1	24.4	81.6	82.8	1	75.0-125			0.986	20

Method Blank (MB)

(MB) R3302461-1 04/17/18 12:33

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.0390	0.250

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302461-2 04/17/18 12:34 • (LCSD) R3302461-3 04/17/18 12:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Cyanide	2.50	2.45	2.38	98.0	95.3	50.0-150			2.76	20

Method Blank (MB)

(MB) R3303173-1 04/18/18 15:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Fluoride	U		0.261	1.00

L986111-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986111-01 04/18/18 18:51 • (DUP) R3303173-4 04/18/18 19:54

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	3.59	3.70	1	2.99		15

L986229-01 Original Sample (OS) • Duplicate (DUP)

(OS) L986229-01 04/19/18 02:10 • (DUP) R3303173-8 04/19/18 02:31

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	ND	3.08	10	0.000		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303173-2 04/18/18 15:48 • (LCSD) R3303173-3 04/18/18 16:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluoride	20.0	19.7	19.5	98.7	97.5	80.0-120			1.16	15

L986111-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986111-02 04/18/18 20:57 • (MS) R3303173-6 04/18/18 21:17 • (MSD) R3303173-7 04/18/18 21:38

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	50.0	3.19	9.15	7.48	11.9	8.57	1	80.0-120	J6	J3 J6	20.1	15

Method Blank (MB)

(MB) R3302625-1 04/17/18 22:30

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302625-2 04/17/18 22:32 • (LCSD) R3302625-3 04/17/18 22:35

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.300	0.345	0.341	115	114	80.0-120			1.08	20

L985823-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985823-02 04/17/18 22:37 • (MS) R3302625-4 04/17/18 22:40 • (MSD) R3302625-5 04/17/18 22:42

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.990	0.0287	1.13	1.11	111	109	1	75.0-125			1.73	20

Method Blank (MB)

(MB) R3302880-1 04/18/18 12:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Antimony	U		0.750	2.00
Arsenic	U		0.650	2.00
Barium	U		0.170	0.500
Beryllium	U		0.0700	0.200
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Cobalt	U		0.230	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Selenium	U		0.740	2.00
Silver	U		0.280	1.00
Thallium	U		0.650	2.00
Vanadium	U		0.240	2.00
Zinc	U		0.590	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302880-2 04/18/18 12:48 • (LCSD) R3302880-3 04/18/18 12:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Antimony	100	103	106	103	106	80.0-120			3.22	20
Arsenic	100	98.6	101	98.6	101	80.0-120			2.31	20
Barium	100	105	108	105	108	80.0-120			2.84	20
Beryllium	100	104	106	104	106	80.0-120			2.01	20
Cadmium	100	98.1	101	98.1	101	80.0-120			2.62	20
Chromium	100	101	104	101	104	80.0-120			2.74	20
Cobalt	100	103	105	103	105	80.0-120			2.40	20
Copper	100	101	104	101	104	80.0-120			2.85	20
Lead	100	98.9	101	98.9	101	80.0-120			2.47	20
Manganese	100	98.9	101	98.9	101	80.0-120			2.62	20
Molybdenum	100	105	108	105	108	80.0-120			2.28	20
Nickel	100	102	104	102	104	80.0-120			2.44	20
Selenium	100	102	106	102	106	80.0-120			3.33	20
Silver	20.0	19.1	19.6	95.3	97.9	80.0-120			2.78	20
Thallium	100	97.0	100	97.0	100	80.0-120			3.10	20
Vanadium	100	103	105	103	105	80.0-120			2.07	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302880-2 04/18/18 12:48 • (LCSD) R3302880-3 04/18/18 12:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Zinc	100	99.5	102	99.5	102	80.0-120			2.72	20

L986114-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L986114-01 04/18/18 12:55 • (MS) R3302880-6 04/18/18 13:04 • (MSD) R3302880-7 04/18/18 13:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	100	ND	80.0	82.9	79.1	82.0	1	75.0-125			3.49	20
Arsenic	100	4.17	105	100	101	96.1	1	75.0-125			4.83	20
Barium	100	17.1	142	176	125	158	1	75.0-125		J3 J5	20.9	20
Beryllium	100	0.306	102	103	102	103	1	75.0-125			0.437	20
Cadmium	100	ND	99.0	96.4	99.0	96.4	1	75.0-125			2.70	20
Chromium	100	6.41	110	106	104	99.6	1	75.0-125			3.95	20
Cobalt	100	ND	114	119	113	118	1	75.0-125			4.48	20
Copper	100	11.3	124	116	112	104	1	75.0-125			6.64	20
Lead	100	1.78	109	104	108	102	1	75.0-125			4.95	20
Manganese	100	133	315	495	183	362	1	75.0-125	J5	J3 J5	44.3	20
Molybdenum	100	9.06	122	110	113	101	1	75.0-125			9.78	20
Nickel	100	14.5	136	128	122	113	1	75.0-125			6.59	20
Selenium	100	ND	102	99.3	102	99.3	1	75.0-125			2.78	20
Silver	20.0	ND	18.8	18.6	94.0	93.1	1	75.0-125			1.06	20
Thallium	100	ND	98.8	96.4	98.8	96.4	1	75.0-125			2.41	20
Vanadium	100	24.2	139	129	115	105	1	75.0-125			6.99	20
Zinc	100	27.9	142	129	114	101	1	75.0-125			9.52	20

WG1098940

QUALITY CONTROL SUMMARY

Polychlorinated Biphenyls (GC) by Method 8082

L985823-02

Method Blank (MB)

(MB) R3302558-1 04/17/18 14:03

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
PCB 1016	U		0.00350	0.0170
PCB 1221	U		0.00537	0.0170
PCB 1232	U		0.00417	0.0170
PCB 1242	U		0.00318	0.0170
PCB 1248	U		0.00315	0.0170
PCB 1254	U		0.00472	0.0170
PCB 1260	U		0.00494	0.0170
(S) Decachlorobiphenyl	*102*			*10.0-148*
(S) Tetrachloro-m-xylene	*71.2*			*21.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302558-2 04/17/18 14:17 • (LCSD) R3302558-3 04/17/18 14:30

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
PCB 1260	0.167	0.162	0.153	97.1	91.8	37.0-145			5.63	37
PCB 1016	0.167	0.138	0.123	83.0	74.1	36.0-141			11.4	35
(S) Decachlorobiphenyl				*121*	*108*	*10.0-148*				
(S) Tetrachloro-m-xylene				*80.4*	*72.3*	*21.0-146*				

L985064-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985064-02 04/17/18 14:44 • (MS) R3302558-4 04/17/18 14:58 • (MSD) R3302558-5 04/17/18 15:24

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
PCB 1260	0.167	0.00580	0.0971	0.111	54.8	63.3	1	10.0-160			13.6	31
PCB 1016	0.167	0.0556	0.142	0.160	51.8	62.4	1	17.0-160			11.7	30
(S) Decachlorobiphenyl					*117*	*106*		*10.0-148*				
(S) Tetrachloro-m-xylene					*81.3*	*83.0*		*21.0-146*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3302455-3 04/17/18 08:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00642	0.0330
Acenaphthylene	U		0.00671	0.0330
Anthracene	U		0.00632	0.0330
Benzidine	U		0.0637	0.333
Benzo(a)anthracene	U		0.00428	0.0330
Benzo(b)fluoranthene	U		0.00695	0.0330
Benzo(k)fluoranthene	U		0.00582	0.0330
Benzo(g,h,i)perylene	U		0.00721	0.0330
Benzo(a)pyrene	U		0.00548	0.0330
Bis(2-chlorethoxy)methane	U		0.00770	0.333
Bis(2-chloroethyl)ether	U		0.00896	0.333
Bis(2-chloroisopropyl)ether	U		0.00760	0.333
4-Bromophenyl-phenylether	U		0.0114	0.333
2-Chloronaphthalene	U		0.00639	0.0330
4-Chlorophenyl-phenylether	U		0.00627	0.333
Chrysene	U		0.00555	0.0330
Dibenz(a,h)anthracene	U		0.00821	0.0330
3,3-Dichlorobenzidine	U		0.0794	0.333
2,4-Dinitrotoluene	U		0.00607	0.333
2,6-Dinitrotoluene	U		0.00737	0.333
Fluoranthene	U		0.00496	0.0330
Fluorene	U		0.00682	0.0330
Hexachlorobenzene	U		0.00856	0.333
Hexachloro-1,3-butadiene	U		0.0100	0.333
Hexachlorocyclopentadiene	U		0.0587	0.333
Hexachloroethane	U		0.0134	0.333
Indeno(1,2,3-cd)pyrene	U		0.00772	0.0330
Isophorone	U		0.00522	0.333
Naphthalene	U		0.00889	0.0330
Nitrobenzene	U		0.00695	0.333
n-Nitrosodimethylamine	U		0.0647	0.333
n-Nitrosodiphenylamine	U		0.00594	0.333
n-Nitrosodi-n-propylamine	U		0.00906	0.333
Phenanthrene	U		0.00528	0.0330
Benzylbutyl phthalate	U		0.0103	0.333
Bis(2-ethylhexyl)phthalate	U		0.0120	0.333
Di-n-butyl phthalate	U		0.0109	0.333
Diethyl phthalate	U		0.00691	0.333
Dimethyl phthalate	U		0.00540	0.333
Di-n-octyl phthalate	U		0.00907	0.333

Method Blank (MB)

(MB) R3302455-3 04/17/18 08:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.0123	0.0330
1,2,4-Trichlorobenzene	U		0.00876	0.333
4-Chloro-3-methylphenol	U		0.00477	0.333
2-Chlorophenol	U		0.00831	0.333
2,4-Dichlorophenol	U		0.00746	0.333
2,4-Dimethylphenol	U		0.0471	0.333
4,6-Dinitro-2-methylphenol	U		0.124	0.333
2,4-Dinitrophenol	U		0.0980	0.333
2-Nitrophenol	U		0.0130	0.333
4-Nitrophenol	U		0.0525	0.333
Pentachlorophenol	U		0.0480	0.333
Phenol	U		0.00695	0.333
2,4,6-Trichlorophenol	U		0.00779	0.333
(S) Nitrobenzene-d5	*71.0*			*18.0-125*
(S) 2-Fluorobiphenyl	*72.4*			*28.0-120*
(S) p-Terphenyl-d14	*87.1*			*13.0-131*
(S) Phenol-d5	*80.9*			*20.0-120*
(S) 2-Fluorophenol	*84.4*			*20.0-120*
(S) 2,4,6-Tribromophenol	*60.2*			*17.0-137*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302455-1 04/17/18 08:09 • (LCSD) R3302455-2 04/17/18 08:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.667	0.507	0.516	76.0	77.3	47.0-120			1.74	21
Acenaphthylene	0.667	0.531	0.557	79.6	83.5	48.0-120			4.81	21
Anthracene	0.667	0.497	0.449	74.5	67.4	46.0-120			9.99	20
Benzidine	0.667	ND	ND	0.000	0.000	1.00-120	J4	J4	0.000	36
Benzo(a)anthracene	0.667	0.504	0.509	75.5	76.2	46.0-120			0.946	20
Benzo(b)fluoranthene	0.667	0.493	0.531	73.9	79.6	45.0-120			7.36	22
Benzo(k)fluoranthene	0.667	0.496	0.491	74.4	73.6	45.0-120			1.01	23
Benzo(g,h,i)perylene	0.667	0.568	0.585	85.1	87.8	48.0-120			3.09	21
Benzo(a)pyrene	0.667	0.518	0.538	77.6	80.6	46.0-120			3.77	21
Bis(2-chlorethoxy)methane	0.667	0.391	0.397	58.6	59.6	41.0-120			1.60	22
Bis(2-chloroethyl)ether	0.667	0.462	0.493	69.3	73.8	28.0-120			6.31	28
Bis(2-chloroisopropyl)ether	0.667	0.419	0.503	62.8	75.3	40.0-120			18.2	27
4-Bromophenyl-phenylether	0.667	0.566	0.500	84.9	75.0	45.0-120			12.4	20
2-Chloronaphthalene	0.667	0.526	0.537	78.8	80.5	43.0-120			2.10	22

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302455-1 04/17/18 08:09 • (LCSD) R3302455-2 04/17/18 08:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Chlorophenyl-phenylether	0.667	0.435	0.460	65.2	69.0	46.0-120			5.72	21
Chrysene	0.667	0.486	0.495	72.8	74.2	46.0-120			1.89	20
Dibenz(a,h)anthracene	0.667	0.546	0.558	81.8	83.7	47.0-120			2.25	22
3,3-Dichlorobenzidine	0.667	0.435	0.458	65.3	68.7	20.0-130			5.13	24
2,4-Dinitrotoluene	0.667	0.474	0.511	71.1	76.6	48.0-122			7.46	21
2,6-Dinitrotoluene	0.667	0.504	0.541	75.5	81.1	46.0-120			7.17	21
Fluoranthene	0.667	0.494	0.461	74.1	69.2	46.0-120			6.91	20
Fluorene	0.667	0.486	0.496	72.9	74.4	47.0-120			1.98	20
Hexachlorobenzene	0.667	0.517	0.479	77.5	71.8	42.0-120			7.64	20
Hexachloro-1,3-butadiene	0.667	0.348	0.314	52.1	47.1	36.0-120			10.0	26
Hexachlorocyclopentadiene	0.667	0.432	0.437	64.8	65.6	20.0-124			1.13	26
Hexachloroethane	0.667	0.429	0.452	64.3	67.8	32.0-120			5.26	31
Indeno(1,2,3-cd)pyrene	0.667	0.553	0.597	82.9	89.6	48.0-120			7.67	21
Isophorone	0.667	0.413	0.414	61.9	62.1	42.0-120			0.297	21
Naphthalene	0.667	0.385	0.396	57.8	59.3	41.0-120			2.59	24
Nitrobenzene	0.667	0.411	0.402	61.6	60.3	36.0-120			2.10	24
n-Nitrosodimethylamine	0.667	0.379	0.393	56.8	58.9	20.0-120			3.70	31
n-Nitrosodiphenylamine	0.667	0.577	0.538	86.6	80.6	42.0-120			7.08	20
n-Nitrosodi-n-propylamine	0.667	0.451	0.471	67.6	70.6	39.0-120			4.41	23
Phenanthrene	0.667	0.530	0.492	79.5	73.7	45.0-120			7.58	20
Benzylbutyl phthalate	0.667	0.499	0.522	74.9	78.2	41.0-123			4.39	20
Bis(2-ethylhexyl)phthalate	0.667	0.503	0.485	75.4	72.7	41.0-124			3.61	20
Di-n-butyl phthalate	0.667	0.512	0.487	76.8	73.0	44.0-120			5.00	20
Diethyl phthalate	0.667	0.454	0.460	68.1	69.0	46.0-120			1.26	20
Dimethyl phthalate	0.667	0.517	0.488	77.6	73.2	47.0-120			5.76	21
Di-n-octyl phthalate	0.667	0.500	0.526	75.0	78.9	40.0-123			5.06	21
Pyrene	0.667	0.507	0.513	76.1	77.0	45.0-120			1.19	21
1,2,4-Trichlorobenzene	0.667	0.359	0.365	53.9	54.8	40.0-120			1.68	25
4-Chloro-3-methylphenol	0.667	0.367	0.341	55.1	51.1	46.0-120			7.53	20
2-Chlorophenol	0.667	0.492	0.509	73.7	76.4	37.0-120			3.52	27
2,4-Dichlorophenol	0.667	0.396	0.380	59.4	57.0	45.0-120			4.09	21
2,4-Dimethylphenol	0.667	0.350	0.362	52.5	54.3	40.0-120			3.42	22
4,6-Dinitro-2-methylphenol	0.667	0.572	0.501	85.7	75.2	34.0-120			13.1	23
2,4-Dinitrophenol	0.667	0.314	0.384	47.1	57.6	10.0-120			20.0	30
2-Nitrophenol	0.667	0.423	0.410	63.4	61.5	42.0-120			3.09	24
4-Nitrophenol	0.667	0.447	0.468	67.0	70.2	40.0-120			4.77	21
Pentachlorophenol	0.667	0.458	0.448	68.7	67.2	33.0-122			2.22	22
Phenol	0.667	0.475	0.526	71.2	78.8	38.0-120			10.1	25
2,4,6-Trichlorophenol	0.667	0.525	0.519	78.7	77.8	47.0-120			1.18	22
(S) Nitrobenzene-d5				*59.9*	*58.3*	*18.0-125*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302455-1 04/17/18 08:09 • (LCSD) R3302455-2 04/17/18 08:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
(S) 2-Fluorobiphenyl				*74.5*	*77.2*	*28.0-120*				
(S) p-Terphenyl-d14				*73.9*	*74.8*	*13.0-131*				
(S) Phenol-d5				*73.1*	*80.1*	*20.0-120*				
(S) 2-Fluorophenol				*77.8*	*81.7*	*20.0-120*				
(S) 2,4,6-Tribromophenol				*68.6*	*61.1*	*17.0-137*				

L985245-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985245-03 04/17/18 14:25 • (MS) R3302455-4 04/17/18 14:49 • (MSD) R3302455-5 04/17/18 15:12

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.822	0.294	0.833	0.840	65.6	66.3	1	37.0-120			0.766	23
Acenaphthylene	0.822	ND	0.611	0.609	74.4	74.2	1	41.0-120			0.239	22
Anthracene	0.822	0.0493	1.10	1.25	128	146	1	30.0-123	J5	J5	12.7	25
Benzidine	0.822	ND	0.107	0.117	13.0	14.3	1	1.00-120			9.25	36
Benzo(a)anthracene	0.822	ND	0.664	0.622	80.8	75.7	1	21.0-123			6.55	26
Benzo(b)fluoranthene	0.822	ND	0.748	0.747	91.0	90.9	1	20.0-127			0.0622	29
Benzo(k)fluoranthene	0.822	ND	0.732	0.738	89.1	89.8	1	22.0-123			0.864	28
Benzo(g,h,i)perylene	0.822	ND	0.339	0.268	41.3	32.6	1	10.0-120			23.5	32
Benzo(a)pyrene	0.822	ND	0.665	0.625	80.9	76.0	1	23.0-120			6.24	27
Bis(2-chlorethoxy)methane	0.822	ND	0.553	0.681	67.3	82.9	1	37.0-120			20.6	22
Bis(2-chloroethyl)ether	0.822	ND	0.629	0.668	76.6	81.3	1	26.0-120			6.01	27
Bis(2-chloroisopropyl)ether	0.822	ND	0.620	0.669	75.5	81.4	1	35.0-120			7.52	25
4-Bromophenyl-phenylether	0.822	ND	0.710	0.722	86.3	87.8	1	34.0-120			1.71	23
2-Chloronaphthalene	0.822	ND	0.463	0.502	56.4	61.0	1	40.0-120			7.92	22
4-Chlorophenyl-phenylether	0.822	ND	0.470	0.447	57.2	54.4	1	37.0-120			5.04	23
Chrysene	0.822	ND	0.652	0.621	79.4	75.5	1	19.0-127			4.98	27
Dibenz(a,h)anthracene	0.822	ND	0.412	0.326	50.2	39.7	1	10.0-120			23.2	28
3,3-Dichlorobenzidine	0.822	ND	0.603	0.580	73.4	70.6	1	10.0-142			3.91	30
2,4-Dinitrotoluene	0.822	ND	0.790	0.841	96.2	102	1	37.0-129			6.19	24
2,6-Dinitrotoluene	0.822	ND	0.748	0.817	91.1	99.4	1	40.0-120			8.75	23
Fluoranthene	0.822	ND	0.538	0.557	62.1	64.4	1	20.0-133			3.46	28
Fluorene	0.822	0.376	0.983	0.997	73.9	75.6	1	35.0-120			1.45	23
Hexachlorobenzene	0.822	ND	0.725	0.796	88.3	96.9	1	33.0-120			9.32	24
Hexachloro-1,3-butadiene	0.822	ND	0.394	0.387	47.9	47.1	1	33.0-120			1.77	25
Hexachlorocyclopentadiene	0.822	ND	0.123	0.0917	15.0	11.2	1	10.0-120			29.5	33
Hexachloroethane	0.822	ND	1.22	1.33	149	162	1	21.0-120	J5	J5	8.26	30
Indeno(1,2,3-cd)pyrene	0.822	ND	0.413	0.335	50.2	40.8	1	10.0-120			20.8	30
Isophorone	0.822	ND	0.649	0.604	78.9	73.4	1	38.0-120			7.19	22

L985245-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L985245-03 04/17/18 14:25 • (MS) R3302455-4 04/17/18 14:49 • (MSD) R3302455-5 04/17/18 15:12

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Naphthalene	0.822	0.198	0.805	0.777	73.9	70.5	1	37.0-120			3.52	25
Nitrobenzene	0.822	ND	0.564	0.561	68.7	68.2	1	32.0-120			0.667	24
n-Nitrosodimethylamine	0.822	ND	0.499	0.526	60.7	64.0	1	18.0-120			5.26	27
n-Nitrosodiphenylamine	0.822	ND	2.27	2.76	277	335	1	20.0-125	E J5	E J5	19.1	25
n-Nitrosodi-n-propylamine	0.822	ND	0.863	0.829	105	101	1	34.0-120			3.91	23
Phenanthrene	0.822	0.991	2.09	2.35	134	165	1	24.0-124	E J5	E J5	11.4	25
Benzylbutyl phthalate	0.822	ND	0.511	0.465	62.2	56.5	1	18.0-130			9.61	27
Bis(2-ethylhexyl)phthalate	0.822	ND	0.672	0.742	81.7	90.3	1	19.0-127			10.0	28
Di-n-butyl phthalate	0.822	ND	0.588	0.642	71.6	78.2	1	29.0-120			8.85	26
Diethyl phthalate	0.822	ND	0.525	0.525	63.9	63.9	1	42.0-121			0.0437	23
Dimethyl phthalate	0.822	ND	0.819	0.909	99.6	111	1	42.0-120			10.4	23
Di-n-octyl phthalate	0.822	ND	0.710	0.580	86.4	70.5	1	21.0-122			20.2	27
Pyrene	0.822	0.0506	0.617	0.573	68.9	63.6	1	19.0-127			7.31	29
1,2,4-Trichlorobenzene	0.822	ND	0.481	0.452	58.5	55.1	1	39.0-120			6.03	25
4-Chloro-3-methylphenol	0.822	ND	0.714	0.721	86.9	87.8	1	37.0-121			1.04	23
2-Chlorophenol	0.822	ND	0.697	0.699	84.9	85.1	1	34.0-120			0.291	25
2,4-Dichlorophenol	0.822	ND	0.520	0.505	63.3	61.4	1	41.0-120			2.97	22
2,4-Dimethylphenol	0.822	ND	0.512	0.467	62.4	56.8	1	27.0-120			9.31	25
4,6-Dinitro-2-methylphenol	0.822	ND	ND	0.182	0.000	22.1	1	10.0-131	J6	J3	200	29
2,4-Dinitrophenol	0.822	ND	ND	ND	0.000	0.000	1	10.0-142	J6	J6	0.000	30
2-Nitrophenol	0.822	ND	0.496	0.622	60.4	75.7	1	34.0-124			22.4	27
4-Nitrophenol	0.822	ND	1.20	1.18	146	144	1	26.0-133	J5	J5	1.06	25
Pentachlorophenol	0.822	ND	0.516	0.563	62.7	68.6	1	15.0-152			8.88	26
Phenol	0.822	ND	0.629	0.659	76.5	80.3	1	33.0-120			4.75	24
2,4,6-Trichlorophenol	0.822	ND	0.555	0.587	67.5	71.4	1	40.0-125			5.65	24
(S) Nitrobenzene-d5					*79.1*	*75.4*		*18.0-125*				
(S) 2-Fluorobiphenyl					*51.9*	*51.8*		*28.0-120*				
(S) p-Terphenyl-d14					*70.7*	*69.6*		*13.0-131*				
(S) Phenol-d5					*81.1*	*89.4*		*20.0-120*				
(S) 2-Fluorophenol					*82.1*	*86.3*		*20.0-120*				
(S) 2,4,6-Tribromophenol					*87.4*	*95.1*		*17.0-137*				

WG1099792 QUALITY CONTROL SUMMARY

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

L985823-02

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3302998-3 04/18/18 16:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	0.000793	J	0.000600	0.00600
Benzo(a)pyrene	0.000639	J	0.000600	0.00600
Benzo(b)fluoranthene	0.000988	J	0.000600	0.00600
Benzo(g,h,i)perylene	0.000773	J	0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	0.000764	J	0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	0.000947	J	0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	*58.0*			*14.0-149*
(S) 2-Fluorobiphenyl	*98.0*			*34.0-125*
(S) p-Terphenyl-d14	*86.6*			*23.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302998-1 04/18/18 15:25 • (LCSD) R3302998-2 04/18/18 15:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.0929	0.0954	116	119	50.0-125			2.68	20
Acenaphthene	0.0800	0.0821	0.0815	103	102	52.0-120			0.626	20
Acenaphthylene	0.0800	0.0791	0.0784	98.9	98.0	51.0-120			0.970	20
Benzo(a)anthracene	0.0800	0.0788	0.0786	98.5	98.3	46.0-121			0.230	20
Benzo(a)pyrene	0.0800	0.0856	0.0852	107	107	42.0-121			0.491	20
Benzo(b)fluoranthene	0.0800	0.0781	0.0792	97.7	98.9	42.0-123			1.31	20
Benzo(g,h,i)perylene	0.0800	0.0904	0.0898	113	112	43.0-128			0.601	20
Benzo(k)fluoranthene	0.0800	0.0913	0.0888	114	111	45.0-128			2.80	20
Chrysene	0.0800	0.0864	0.0880	108	110	48.0-127			1.82	20
Dibenz(a,h)anthracene	0.0800	0.0894	0.0891	112	111	43.0-132			0.352	20
Fluoranthene	0.0800	0.0878	0.0901	110	113	49.0-129			2.56	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3302998-1 04/18/18 15:25 • (LCSD) R3302998-2 04/18/18 15:47

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Fluorene	0.0800	0.0776	0.0769	97.0	96.1	50.0-120			0.968	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0900	0.0899	113	112	44.0-131			0.151	20
Naphthalene	0.0800	0.0725	0.0714	90.7	89.2	50.0-120			1.60	20
Phenanthrene	0.0800	0.0823	0.0843	103	105	48.0-120			2.45	20
Pyrene	0.0800	0.0771	0.0784	96.4	98.0	48.0-135			1.65	20
1-Methylnaphthalene	0.0800	0.0819	0.0808	102	101	52.0-122			1.43	20
2-Methylnaphthalene	0.0800	0.0781	0.0779	97.7	97.4	52.0-120			0.283	20
2-Chloronaphthalene	0.0800	0.0798	0.0797	99.7	99.6	50.0-120			0.158	20
(S) Nitrobenzene-d5				*58.1*	*56.2*	*14.0-149*				
(S) 2-Fluorobiphenyl				*92.3*	*90.0*	*34.0-125*				
(S) p-Terphenyl-d14				*82.0*	*78.5*	*23.0-120*				

GLOSSARY OF TERMS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

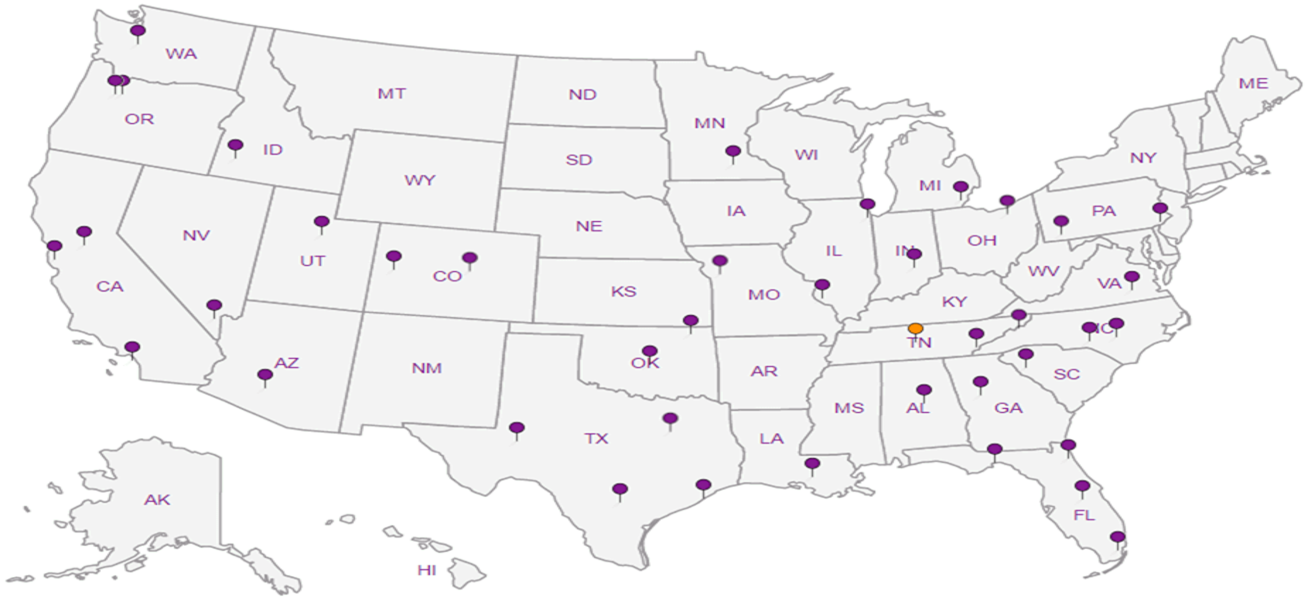
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SLR International Corp. - West Linn, OR

1800 Blankenship Road, Suite 440

Billing Information:

Accounts Payable
1800 Blankenship Rd, Ste 440
West Linn, OR 97068

Pres Chk

Report to:
Tyler Weber

Email To: tweber@slrconsulting.com

Project Description: Selmet Fooc Delisty

City/State Collected: Albany, OR

Phone: 503-723-4423
Fax:

Client Project #

Lab Project #
SLRWLOR-WEBER

Collected by (print): Tyler Weber

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 985823

G136

Acctnum: SLRWLOR
Template: T132913
Prelogin: P639719
TSR: 110 - Brian Ford
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	Cyanide, F, Cr6IC 8ozClr-NoPres	SV8082 PCBs 4ozClr-NoPres	SV8270D SVOCs 4ozClr-NoPres	SV8270PAHSIMD LL PAH 4ozClr-NoPres	Total Metals* 2ozClr-NoPres	V8260 VOCs 2ozClr-NoPres	V8260 VOCs 40ml/NaHS04/Syr/MeOH	Remarks	Sample # (lab only)
Pond Grid 26	Grab	SS	—	4/12/18	15:50 4	~~4~~						X	X		-1
Pond Composite B	Composite	SS	—	4/12/18	16:00 6	~~7~~	X	X	X	X	X				-2
		SS													
		SS													
		SS													
		SS													
		SS													
		SS													
		SS													
		SS													

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: *Total Metals=please list metals needed here

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ______

Tracking # 7466 1466 7835

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: __Y ✓N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)
Date: 4/12/18
Time: 20:00

Received by: (Signature)

Trip Blank Received: [✓ Yes] / ~~No~~ 1 [✓ HCl] / MeoH TBR

Relinquished by : (Signature)
Date:
Time:

Received by: (Signature)

Temp: 4.1 °C

Bottles Received: 10

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:

Received for lab by: (Signature) 904

Date: 4/14/18
Time: 9:00

Hold:

Condition: [✓ NCF] / ~~OK~~

From: Tyler Weber <tweber@slrconsulting.com>
Sent: Friday, April 13, 2018 8:43 PM
To: Brian Ford
Subject: Re: ESC Lab Sciences Login for Stormwater Sampling L985661

Hi Brian,

There will be a set of samples arriving tomorrow from us. I realized I did not put the trip blank on the pond sample. Please add that to the COC and run it with the pond samples.

Thanks,

Tyler

-------- Original message --------
From: Brian Ford <bford@esclabsciences.com>
Date: 4/13/18 3:24 PM (GMT-08:00)
To: ryanl@selmetinc.com, Steven Hammer <shammer@slrconsulting.com>, judyt@selmetinc.com, Tyler Weber <tweber@slrconsulting.com>
Subject: ESC Lab Sciences Login for Stormwater Sampling L985661

Thank you for choosing ESC Lab Sciences! Please find enclosed PDF files containing your laboratory login confirmation and chain of custody.

ESC is leading the laboratory industry with our On-line Data Management tools. Please contact your Technical Service Representative to learn how to create historical Excel tables or access data in real time using powerful and intuitive software that is only available at http://www.esclabsciences.com.

Visit ESC's secure data management web site - myESC - for all your reporting and data management needs at http://www.esclabsciences.com/login

ESC ... "Your Lab of Choice"

Brian Ford
Technical Service Representative
615-773-9772

ESC Lab Sciences
12065 Lebanon Rd.
Mt. Juliet, TN 37122

SLR

Tyler Weber, E.I.
Project Engineer
d 503-905-3208
c 503-939-5486
o 503-723-4423
e tweber@slrconsulting.com

SLR International Corporation
1800 Blankenship Road, Suite 440, West Linn, OR, 97068

WINNERS: International Business Excellence Award, 2016

Matt Shacklock

ESC Lab Sciences
Non-Conformance Form

Login #:985823	Client:SLRWLOR	Date:04/14/18	Evaluated by: Matthew Lockhart

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type	x	Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
x	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments:Client did not send bulk container sample for Paul Grid 26.

2) Clarification of metals needed to be ran.

Client informed by:		Call		Email	x	Voice Mail	Date:04/16/18	Time:1100
TSR Initials:bjf	Client Contact: Tyler Weber							

Login Instructions:

1) Will report in wet weight.
2) M6010CAM17 + MNICP.

ANALYTICAL REPORT

May 17, 2018

Selmet, Inc

Sample Delivery Group:	L987450
Samples Received:	04/20/2018
Project Number:	108.00256.00029
Description:	Selmet F006 Delisting
Report To:	Tyler Weber 33992 SE Seven Mile Lane Albany, OR 97322

Entire Report Reviewed By: Chris Ward

Chris Ward
Technical Service Representative

TABLE OF CONTENTS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

POND COMPOSITE A L987450-01 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 14:15	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101966	1	04/24/18 13:49	04/24/18 14:00	KDW
Wet Chemistry by Method 7199	WG1101979	10	04/24/18 16:56	04/25/18 18:48	GB
Wet Chemistry by Method 9012B	WG1101728	1	04/25/18 14:33	04/25/18 16:46	KK
Wet Chemistry by Method 9056A	WG1101642	20	04/23/18 20:48	04/25/18 16:51	MAJ
Mercury by Method 7471A	WG1102647	1	04/24/18 22:58	04/25/18 08:57	ABL
Metals (ICP) by Method 6010B	WG1102597	20	04/24/18 20:58	04/26/18 12:11	TRB
Polychlorinated Biphenyls (GC) by Method 8082	WG1101748	1	04/23/18 06:42	04/23/18 16:59	TD
Semi Volatile Organic Compounds (GC/MS) by Method 8270D	WG1101733	10	04/24/18 08:28	04/27/18 22:01	ADF
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1101758	1	04/23/18 07:16	04/24/18 15:30	DMG

POND COMPOSITE C L987450-02 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 14:05	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101966	1	04/24/18 13:49	04/24/18 14:00	KDW
Wet Chemistry by Method 7199	WG1101979	10	04/24/18 16:56	04/25/18 18:55	GB
Wet Chemistry by Method 9012B	WG1101728	1	04/25/18 14:33	04/25/18 16:47	KK
Wet Chemistry by Method 9056A	WG1101642	50	04/23/18 20:48	04/25/18 17:33	MAJ
Mercury by Method 7471A	WG1102647	1	04/24/18 22:58	04/25/18 09:00	ABL
Metals (ICP) by Method 6010B	WG1102597	10	04/24/18 20:58	04/26/18 13:21	TRB
Polychlorinated Biphenyls (GC) by Method 8082	WG1101748	1	04/23/18 06:42	04/23/18 17:13	TD
Semi Volatile Organic Compounds (GC/MS) by Method 8270D	WG1101733	10	04/24/18 08:28	04/27/18 21:14	CJR
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1101758	1	04/23/18 07:16	04/24/18 16:33	DMG

POND COMPOSITE D L987450-03 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 12:55	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101966	1	04/24/18 13:49	04/24/18 14:00	KDW
Wet Chemistry by Method 7199	WG1101979	10	04/24/18 16:56	04/25/18 19:01	GB
Wet Chemistry by Method 9012B	WG1101728	1	04/25/18 14:33	04/25/18 16:48	KK
Wet Chemistry by Method 9056A	WG1101642	50	04/23/18 20:48	04/25/18 18:36	MAJ
Mercury by Method 7471A	WG1102647	1	04/24/18 22:58	04/25/18 09:02	ABL
Metals (ICP) by Method 6010B	WG1102597	10	04/24/18 20:58	04/26/18 13:24	TRB
Polychlorinated Biphenyls (GC) by Method 8082	WG1101748	1	04/23/18 06:42	04/23/18 17:28	TD
Semi Volatile Organic Compounds (GC/MS) by Method 8270D	WG1101733	10	04/24/18 08:28	04/27/18 21:38	CJR
Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM	WG1101758	1	04/23/18 07:16	04/24/18 16:55	DMG

POND GRID 16 L987450-04 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 13:35	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101966	1	04/24/18 13:49	04/24/18 14:00	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1101154	1	04/18/18 13:35	04/20/18 19:32	LRL

POND GRID 26 L987450-05 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 13:15	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101966	1	04/24/18 13:49	04/24/18 14:00	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1101154	1	04/18/18 13:15	04/20/18 19:52	LRL

POND GRID 42 L987450-06 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 13:55	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101968	1	04/23/18 17:04	04/23/18 17:13	JD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1101154	1	04/18/18 13:55	04/20/18 20:12	LRL

POND GRID 59 L987450-07 Solid

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 11:30	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1101968	1	04/23/18 17:04	04/23/18 17:13	JD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1101154	1.14	04/18/18 11:30	04/20/18 20:32	LRL

TRIP BLANK L987450-08 GW

Collected by	Collected date/time	Received date/time
Tyler Weber	04/18/18 00:00	04/20/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1101237	1	04/20/18 22:23	04/20/18 22:23	RAS

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward

Chris Ward
Technical Service Representative

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	43.0		1	04/24/2018 14:00	WG1101966

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		5.93	23.3	10	04/25/2018 18:48	WG1101979

Sample Narrative:

L987450-01 WG1101979: DILUTION DUE TO MATRIX INTERFERENCE

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	U		0.0907	0.581	1	04/25/2018 16:46	WG1101728

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	3080		12.1	46.5	20	04/25/2018 16:51	WG1101642

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.00651	0.0465	1	04/25/2018 08:57	WG1102647

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Antimony	U		34.9	93.0	20	04/26/2018 12:11	WG1102597
Arsenic	U		30.2	93.0	20	04/26/2018 12:11	WG1102597
Barium	75.7		7.91	23.3	20	04/26/2018 12:11	WG1102597
Beryllium	U		3.26	9.30	20	04/26/2018 12:11	WG1102597
Cadmium	U		3.26	23.3	20	04/26/2018 12:11	WG1102597
Chromium	110		6.51	46.5	20	04/26/2018 12:11	WG1102597
Cobalt	U		10.7	46.5	20	04/26/2018 12:11	WG1102597
Copper	U		24.6	93.0	20	04/26/2018 12:11	WG1102597
Lead	U		8.84	23.3	20	04/26/2018 12:11	WG1102597
Manganese	185		5.58	46.5	20	04/26/2018 12:11	WG1102597
Molybdenum	80.5		7.44	23.3	20	04/26/2018 12:11	WG1102597
Nickel	32.2	J	22.8	93.0	20	04/26/2018 12:11	WG1102597
Selenium	U		34.4	93.0	20	04/26/2018 12:11	WG1102597
Silver	105		13.0	46.5	20	04/26/2018 12:11	WG1102597
Thallium	U		30.2	93.0	20	04/26/2018 12:11	WG1102597
Vanadium	1130		11.2	93.0	20	04/26/2018 12:11	WG1102597
Zinc	56.7	J	27.4	233	20	04/26/2018 12:11	WG1102597

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.00814	0.0395	1	04/23/2018 16:59	WG1101748
PCB 1221	U		0.0125	0.0395	1	04/23/2018 16:59	WG1101748
PCB 1232	U		0.00970	0.0395	1	04/23/2018 16:59	WG1101748
PCB 1242	U		0.00739	0.0395	1	04/23/2018 16:59	WG1101748

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1248	U		0.00732	0.0395	1	04/23/2018 16:59	WG1101748
PCB 1254	U		0.0110	0.0395	1	04/23/2018 16:59	WG1101748
PCB 1260	U		0.0115	0.0395	1	04/23/2018 16:59	WG1101748
(S) Decachlorobiphenyl	*46.6*			*10.0-148*		*04/23/2018 16:59*	WG1101748
(S) Tetrachloro-m-xylene	*56.8*			*21.0-146*		*04/23/2018 16:59*	WG1101748

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.149	0.767	10	04/27/2018 22:01	WG1101733
Acenaphthylene	U		0.156	0.767	10	04/27/2018 22:01	WG1101733
Anthracene	U		0.147	0.767	10	04/27/2018 22:01	WG1101733
Benzidine	U		1.48	7.74	10	04/27/2018 22:01	WG1101733
Benzo(a)anthracene	U		0.0995	0.767	10	04/27/2018 22:01	WG1101733
Benzo(b)fluoranthene	U		0.162	0.767	10	04/27/2018 22:01	WG1101733
Benzo(k)fluoranthene	U		0.135	0.767	10	04/27/2018 22:01	WG1101733
Benzo(g,h,i)perylene	U		0.168	0.767	10	04/27/2018 22:01	WG1101733
Benzo(a)pyrene	U		0.127	0.767	10	04/27/2018 22:01	WG1101733
Bis(2-chlorethoxy)methane	U		0.179	7.74	10	04/27/2018 22:01	WG1101733
Bis(2-chloroethyl)ether	U		0.208	7.74	10	04/27/2018 22:01	WG1101733
Bis(2-chloroisopropyl)ether	U		0.177	7.74	10	04/27/2018 22:01	WG1101733
4-Bromophenyl-phenylether	U		0.265	7.74	10	04/27/2018 22:01	WG1101733
2-Chloronaphthalene	U		0.149	0.767	10	04/27/2018 22:01	WG1101733
4-Chlorophenyl-phenylether	U		0.146	7.74	10	04/27/2018 22:01	WG1101733
Chrysene	U		0.129	0.767	10	04/27/2018 22:01	WG1101733
Dibenz(a,h)anthracene	U		0.191	0.767	10	04/27/2018 22:01	WG1101733
3,3-Dichlorobenzidine	U		1.85	7.74	10	04/27/2018 22:01	WG1101733
2,4-Dinitrotoluene	U		0.141	7.74	10	04/27/2018 22:01	WG1101733
2,6-Dinitrotoluene	U		0.171	7.74	10	04/27/2018 22:01	WG1101733
Fluoranthene	U		0.115	0.767	10	04/27/2018 22:01	WG1101733
Fluorene	U		0.159	0.767	10	04/27/2018 22:01	WG1101733
Hexachlorobenzene	U		0.199	7.74	10	04/27/2018 22:01	WG1101733
Hexachloro-1,3-butadiene	U		0.233	7.74	10	04/27/2018 22:01	WG1101733
Hexachlorocyclopentadiene	U		1.36	7.74	10	04/27/2018 22:01	WG1101733
Hexachloroethane	U		0.312	7.74	10	04/27/2018 22:01	WG1101733
Indeno(1,2,3-cd)pyrene	U		0.179	0.767	10	04/27/2018 22:01	WG1101733
Isophorone	U	J3	0.121	7.74	10	04/27/2018 22:01	WG1101733
Naphthalene	U		0.207	0.767	10	04/27/2018 22:01	WG1101733
Nitrobenzene	U		0.162	7.74	10	04/27/2018 22:01	WG1101733
n-Nitrosodimethylamine	U		1.50	7.74	10	04/27/2018 22:01	WG1101733
n-Nitrosodiphenylamine	U		0.138	7.74	10	04/27/2018 22:01	WG1101733
n-Nitrosodi-n-propylamine	U		0.211	7.74	10	04/27/2018 22:01	WG1101733
Phenanthrene	U		0.123	0.767	10	04/27/2018 22:01	WG1101733
Benzylbutyl phthalate	0.304	J	0.239	7.74	10	04/27/2018 22:01	WG1101733
Bis(2-ethylhexyl)phthalate	0.477	J	0.279	7.74	10	04/27/2018 22:01	WG1101733
Di-n-butyl phthalate	U		0.253	7.74	10	04/27/2018 22:01	WG1101733
Diethyl phthalate	U		0.161	7.74	10	04/27/2018 22:01	WG1101733
Dimethyl phthalate	U		0.126	7.74	10	04/27/2018 22:01	WG1101733
Di-n-octyl phthalate	U		0.211	7.74	10	04/27/2018 22:01	WG1101733
Pyrene	U		0.286	0.767	10	04/27/2018 22:01	WG1101733
1,2,4-Trichlorobenzene	U		0.204	7.74	10	04/27/2018 22:01	WG1101733
4-Chloro-3-methylphenol	U	J3	0.111	7.74	10	04/27/2018 22:01	WG1101733
2-Chlorophenol	U		0.193	7.74	10	04/27/2018 22:01	WG1101733
2,4-Dichlorophenol	U		0.173	7.74	10	04/27/2018 22:01	WG1101733
2,4-Dimethylphenol	U		1.10	7.74	10	04/27/2018 22:01	WG1101733
4,6-Dinitro-2-methylphenol	U		2.88	7.74	10	04/27/2018 22:01	WG1101733

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2,4-Dinitrophenol	U		2.28	7.74	10	04/27/2018 22:01	WG1101733
2-Nitrophenol	U		0.302	7.74	10	04/27/2018 22:01	WG1101733
4-Nitrophenol	U		1.22	7.74	10	04/27/2018 22:01	WG1101733
Pentachlorophenol	U		1.12	7.74	10	04/27/2018 22:01	WG1101733
Phenol	U		0.162	7.74	10	04/27/2018 22:01	WG1101733
2,4,6-Trichlorophenol	U		0.181	7.74	10	04/27/2018 22:01	WG1101733
(S) 2-Fluorophenol	*99.0*			*20.0-120*		*04/27/2018 22:01*	WG1101733
(S) Phenol-d5	*85.7*			*20.0-120*		*04/27/2018 22:01*	WG1101733
(S) Nitrobenzene-d5	*99.5*			*18.0-125*		*04/27/2018 22:01*	WG1101733
(S) 2-Fluorobiphenyl	*92.1*			*28.0-120*		*04/27/2018 22:01*	WG1101733
(S) 2,4,6-Tribromophenol	*81.8*			*17.0-137*		*04/27/2018 22:01*	WG1101733
(S) p-Terphenyl-d14	*100*			*13.0-131*		*04/27/2018 22:01*	WG1101733

Sample Narrative:

L987450-01 WG1101733: Dilution due to matrix impact during extract concentration procedure

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Acenaphthene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Acenaphthylene	0.00687	J J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Benzo(a)anthracene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Benzo(a)pyrene	0.00756	J J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Benzo(b)fluoranthene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Benzo(g,h,i)perylene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Benzo(k)fluoranthene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Chrysene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Dibenz(a,h)anthracene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Fluoranthene	0.00183	J J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Fluorene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Indeno(1,2,3-cd)pyrene	U	J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Naphthalene	U		0.00465	0.0465	1	04/24/2018 15:30	WG1101758
Phenanthrene	0.00146	J J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
Pyrene	0.00152	J J3	0.00140	0.0140	1	04/24/2018 15:30	WG1101758
1-Methylnaphthalene	U	J3	0.00465	0.0465	1	04/24/2018 15:30	WG1101758
2-Methylnaphthalene	U	J3	0.00465	0.0465	1	04/24/2018 15:30	WG1101758
2-Chloronaphthalene	U	J3	0.00465	0.0465	1	04/24/2018 15:30	WG1101758
(S) Nitrobenzene-d5	*79.3*			*14.0-149*		*04/24/2018 15:30*	WG1101758
(S) 2-Fluorobiphenyl	*69.0*			*34.0-125*		*04/24/2018 15:30*	WG1101758
(S) p-Terphenyl-d14	*75.8*			*23.0-120*		*04/24/2018 15:30*	WG1101758

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	%			date / time	
Total Solids	45.2		1	04/24/2018 14:00	WG1101966

Wet Chemistry by Method 7199

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Hexavalent Chromium	U		5.64	22.1	10	04/25/2018 18:55	WG1101979

Sample Narrative:

L987450-02 WG1101979: DILUTION DUE TO MATRIX INTERFERENCE

Wet Chemistry by Method 9012B

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Cyanide	0.0950	J	0.0862	0.553	1	04/25/2018 16:47	WG1101728

Wet Chemistry by Method 9056A

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Fluoride	3500		28.7	111	50	04/25/2018 17:33	WG1101642

Mercury by Method 7471A

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Mercury	U		0.00619	0.0442	1	04/25/2018 09:00	WG1102647

Metals (ICP) by Method 6010B

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Antimony	U		16.6	44.2	10	04/26/2018 13:21	WG1102597
Arsenic	U		14.4	44.2	10	04/26/2018 13:21	WG1102597
Barium	114		3.76	11.1	10	04/26/2018 13:21	WG1102597
Beryllium	U		1.55	4.42	10	04/26/2018 13:21	WG1102597
Cadmium	U		1.55	11.1	10	04/26/2018 13:21	WG1102597
Chromium	80.4		3.09	22.1	10	04/26/2018 13:21	WG1102597
Cobalt	U		5.08	22.1	10	04/26/2018 13:21	WG1102597
Copper	U		11.7	44.2	10	04/26/2018 13:21	WG1102597
Lead	U		4.20	11.1	10	04/26/2018 13:21	WG1102597
Manganese	130		2.65	22.1	10	04/26/2018 13:21	WG1102597
Molybdenum	115		3.54	11.1	10	04/26/2018 13:21	WG1102597
Nickel	16.9	J	10.8	44.2	10	04/26/2018 13:21	WG1102597
Selenium	U		16.4	44.2	10	04/26/2018 13:21	WG1102597
Silver	190		6.19	22.1	10	04/26/2018 13:21	WG1102597
Thallium	U		14.4	44.2	10	04/26/2018 13:21	WG1102597
Vanadium	1330		5.31	44.2	10	04/26/2018 13:21	WG1102597
Zinc	44.0	J	13.0	111	10	04/26/2018 13:21	WG1102597

Sample Narrative:

L987450-02 WG1102597: Reporting at 10x, MS/MSD refer to 1x diluton only and are not applicable.

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.00774	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1221	U		0.0119	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1232	U		0.00922	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1242	U		0.00703	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1248	U		0.00696	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1254	U		0.0104	0.0376	1	04/23/2018 17:13	WG1101748
PCB 1260	U		0.0109	0.0376	1	04/23/2018 17:13	WG1101748
(S) Decachlorobiphenyl	*47.7*			*10.0-148*		*04/23/2018 17:13*	WG1101748
(S) Tetrachloro-m-xylene	*52.6*			*21.0-146*		*04/23/2018 17:13*	WG1101748

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.142	0.729	10	04/27/2018 21:14	WG1101733
Acenaphthylene	U		0.148	0.729	10	04/27/2018 21:14	WG1101733
Anthracene	U		0.140	0.729	10	04/27/2018 21:14	WG1101733
Benzidine	U		1.41	7.36	10	04/27/2018 21:14	WG1101733
Benzo(a)anthracene	U		0.0946	0.729	10	04/27/2018 21:14	WG1101733
Benzo(b)fluoranthene	U		0.154	0.729	10	04/27/2018 21:14	WG1101733
Benzo(k)fluoranthene	U		0.129	0.729	10	04/27/2018 21:14	WG1101733
Benzo(g,h,i)perylene	U		0.159	0.729	10	04/27/2018 21:14	WG1101733
Benzo(a)pyrene	U		0.121	0.729	10	04/27/2018 21:14	WG1101733
Bis(2-chlorethoxy)methane	U		0.170	7.36	10	04/27/2018 21:14	WG1101733
Bis(2-chloroethyl)ether	U		0.198	7.36	10	04/27/2018 21:14	WG1101733
Bis(2-chloroisopropyl)ether	U		0.168	7.36	10	04/27/2018 21:14	WG1101733
4-Bromophenyl-phenylether	U		0.252	7.36	10	04/27/2018 21:14	WG1101733
2-Chloronaphthalene	U		0.141	0.729	10	04/27/2018 21:14	WG1101733
4-Chlorophenyl-phenylether	U		0.139	7.36	10	04/27/2018 21:14	WG1101733
Chrysene	U		0.123	0.729	10	04/27/2018 21:14	WG1101733
Dibenz(a,h)anthracene	U		0.181	0.729	10	04/27/2018 21:14	WG1101733
3,3-Dichlorobenzidine	U		1.76	7.36	10	04/27/2018 21:14	WG1101733
2,4-Dinitrotoluene	U		0.134	7.36	10	04/27/2018 21:14	WG1101733
2,6-Dinitrotoluene	U		0.163	7.36	10	04/27/2018 21:14	WG1101733
Fluoranthene	U		0.110	0.729	10	04/27/2018 21:14	WG1101733
Fluorene	U		0.151	0.729	10	04/27/2018 21:14	WG1101733
Hexachlorobenzene	U		0.189	7.36	10	04/27/2018 21:14	WG1101733
Hexachloro-1,3-butadiene	U		0.221	7.36	10	04/27/2018 21:14	WG1101733
Hexachlorocyclopentadiene	U		1.30	7.36	10	04/27/2018 21:14	WG1101733
Hexachloroethane	U		0.296	7.36	10	04/27/2018 21:14	WG1101733
Indeno(1,2,3-cd)pyrene	U		0.171	0.729	10	04/27/2018 21:14	WG1101733
Isophorone	U	J3	0.115	7.36	10	04/27/2018 21:14	WG1101733
Naphthalene	U		0.197	0.729	10	04/27/2018 21:14	WG1101733
Nitrobenzene	U		0.154	7.36	10	04/27/2018 21:14	WG1101733
n-Nitrosodimethylamine	U		1.43	7.36	10	04/27/2018 21:14	WG1101733
n-Nitrosodiphenylamine	U		0.131	7.36	10	04/27/2018 21:14	WG1101733
n-Nitrosodi-n-propylamine	U		0.200	7.36	10	04/27/2018 21:14	WG1101733
Phenanthrene	U		0.117	0.729	10	04/27/2018 21:14	WG1101733
Benzylbutyl phthalate	0.243	J	0.228	7.36	10	04/27/2018 21:14	WG1101733
Bis(2-ethylhexyl)phthalate	0.322	J	0.265	7.36	10	04/27/2018 21:14	WG1101733
Di-n-butyl phthalate	U		0.241	7.36	10	04/27/2018 21:14	WG1101733
Diethyl phthalate	U		0.153	7.36	10	04/27/2018 21:14	WG1101733
Dimethyl phthalate	U		0.119	7.36	10	04/27/2018 21:14	WG1101733
Di-n-octyl phthalate	U		0.200	7.36	10	04/27/2018 21:14	WG1101733
Pyrene	U		0.272	0.729	10	04/27/2018 21:14	WG1101733
1,2,4-Trichlorobenzene	U		0.194	7.36	10	04/27/2018 21:14	WG1101733
4-Chloro-3-methylphenol	U	J3	0.105	7.36	10	04/27/2018 21:14	WG1101733

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2-Chlorophenol	U		0.184	7.36	10	04/27/2018 21:14	WG1101733
2,4-Dichlorophenol	U		0.165	7.36	10	04/27/2018 21:14	WG1101733
2,4-Dimethylphenol	U		1.04	7.36	10	04/27/2018 21:14	WG1101733
4,6-Dinitro-2-methylphenol	U		2.74	7.36	10	04/27/2018 21:14	WG1101733
2,4-Dinitrophenol	U		2.17	7.36	10	04/27/2018 21:14	WG1101733
2-Nitrophenol	U		0.287	7.36	10	04/27/2018 21:14	WG1101733
4-Nitrophenol	U		1.16	7.36	10	04/27/2018 21:14	WG1101733
Pentachlorophenol	U		1.06	7.36	10	04/27/2018 21:14	WG1101733
Phenol	U		0.154	7.36	10	04/27/2018 21:14	WG1101733
2,4,6-Trichlorophenol	U		0.172	7.36	10	04/27/2018 21:14	WG1101733
(S) 2-Fluorophenol	*90.4*			*20.0-120*		*04/27/2018 21:14*	WG1101733
(S) Phenol-d5	*78.7*			*20.0-120*		*04/27/2018 21:14*	WG1101733
(S) Nitrobenzene-d5	*86.4*			*18.0-125*		*04/27/2018 21:14*	WG1101733
(S) 2-Fluorobiphenyl	*86.7*			*28.0-120*		*04/27/2018 21:14*	WG1101733
(S) 2,4,6-Tribromophenol	*85.6*			*17.0-137*		*04/27/2018 21:14*	WG1101733
(S) p-Terphenyl-d14	*95.6*			*13.0-131*		*04/27/2018 21:14*	WG1101733

Sample Narrative:

L987450-02 WG1101733: Dilution due to matrix impact during extract concentration procedure

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Acenaphthene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Acenaphthylene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Benzo(a)anthracene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Benzo(a)pyrene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Benzo(b)fluoranthene	0.00159	J	0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Benzo(g,h,i)perylene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Benzo(k)fluoranthene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Chrysene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Dibenz(a,h)anthracene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Fluoranthene	0.00187	J	0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Fluorene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Indeno(1,2,3-cd)pyrene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Naphthalene	U		0.00442	0.0442	1	04/24/2018 16:33	WG1101758
Phenanthrene	U		0.00133	0.0133	1	04/24/2018 16:33	WG1101758
Pyrene	0.00212	J	0.00133	0.0133	1	04/24/2018 16:33	WG1101758
1-Methylnaphthalene	0.00679	J	0.00442	0.0442	1	04/24/2018 16:33	WG1101758
2-Methylnaphthalene	U		0.00442	0.0442	1	04/24/2018 16:33	WG1101758
2-Chloronaphthalene	U		0.00442	0.0442	1	04/24/2018 16:33	WG1101758
(S) Nitrobenzene-d5	*75.5*			*14.0-149*		*04/24/2018 16:33*	WG1101758
(S) 2-Fluorobiphenyl	*72.8*			*34.0-125*		*04/24/2018 16:33*	WG1101758
(S) p-Terphenyl-d14	*84.4*			*23.0-120*		*04/24/2018 16:33*	WG1101758

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	45.0		1	04/24/2018 14:00	WG1101966

Wet Chemistry by Method 7199

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	17.9	J	5.66	22.2	10	04/25/2018 19:01	WG1101979

Sample Narrative:

L987450-03 WG1101979: DILUTION DUE TO MATRIX INTERFERENCE

Wet Chemistry by Method 9012B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Cyanide	U		0.0866	0.555	1	04/25/2018 16:48	WG1101728

Wet Chemistry by Method 9056A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Fluoride	4190		28.9	111	50	04/25/2018 18:36	WG1101642

Mercury by Method 7471A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Mercury	U		0.00622	0.0444	1	04/25/2018 09:02	WG1102647

Metals (ICP) by Method 6010B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Antimony	U		16.6	44.4	10	04/26/2018 13:24	WG1102597
Arsenic	U		14.4	44.4	10	04/26/2018 13:24	WG1102597
Barium	122		3.77	11.1	10	04/26/2018 13:24	WG1102597
Beryllium	U		1.55	4.44	10	04/26/2018 13:24	WG1102597
Cadmium	U		1.55	11.1	10	04/26/2018 13:24	WG1102597
Chromium	97.5		3.11	22.2	10	04/26/2018 13:24	WG1102597
Cobalt	10.1	J	5.11	22.2	10	04/26/2018 13:24	WG1102597
Copper	17.4	J	11.8	44.4	10	04/26/2018 13:24	WG1102597
Lead	U		4.22	11.1	10	04/26/2018 13:24	WG1102597
Manganese	179		2.66	22.2	10	04/26/2018 13:24	WG1102597
Molybdenum	81.0		3.55	11.1	10	04/26/2018 13:24	WG1102597
Nickel	27.5	J	10.9	44.4	10	04/26/2018 13:24	WG1102597
Selenium	U		16.4	44.4	10	04/26/2018 13:24	WG1102597
Silver	73.3		6.22	22.2	10	04/26/2018 13:24	WG1102597
Thallium	U		14.4	44.4	10	04/26/2018 13:24	WG1102597
Vanadium	1060		5.33	44.4	10	04/26/2018 13:24	WG1102597
Zinc	53.8	J	13.1	111	10	04/26/2018 13:24	WG1102597

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	U		0.00777	0.0377	1	04/23/2018 17:28	WG1101748
PCB 1221	U		0.0119	0.0377	1	04/23/2018 17:28	WG1101748
PCB 1232	U		0.00926	0.0377	1	04/23/2018 17:28	WG1101748
PCB 1242	U		0.00706	0.0377	1	04/23/2018 17:28	WG1101748

POND COMPOSITE D

Collected date/time: 04/18/18 12:55

SAMPLE RESULTS - 03

L987450

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1248	U		0.00699	0.0377	1	04/23/2018 17:28	WG1101748
PCB 1254	U		0.0105	0.0377	1	04/23/2018 17:28	WG1101748
PCB 1260	U		0.0110	0.0377	1	04/23/2018 17:28	WG1101748
(S) Decachlorobiphenyl	*50.4*			*10.0-148*		*04/23/2018 17:28*	WG1101748
(S) Tetrachloro-m-xylene	*55.2*			*21.0-146*		*04/23/2018 17:28*	WG1101748

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.143	0.733	10	04/27/2018 21:38	WG1101733
Acenaphthylene	U		0.149	0.733	10	04/27/2018 21:38	WG1101733
Anthracene	U		0.140	0.733	10	04/27/2018 21:38	WG1101733
Benzidine	U		1.41	7.39	10	04/27/2018 21:38	WG1101733
Benzo(a)anthracene	U		0.0950	0.733	10	04/27/2018 21:38	WG1101733
Benzo(b)fluoranthene	U		0.154	0.733	10	04/27/2018 21:38	WG1101733
Benzo(k)fluoranthene	U		0.129	0.733	10	04/27/2018 21:38	WG1101733
Benzo(g,h,i)perylene	U		0.160	0.733	10	04/27/2018 21:38	WG1101733
Benzo(a)pyrene	U		0.122	0.733	10	04/27/2018 21:38	WG1101733
Bis(2-chlorethoxy)methane	U		0.171	7.39	10	04/27/2018 21:38	WG1101733
Bis(2-chloroethyl)ether	U		0.199	7.39	10	04/27/2018 21:38	WG1101733
Bis(2-chloroisopropyl)ether	U		0.169	7.39	10	04/27/2018 21:38	WG1101733
4-Bromophenyl-phenylether	U		0.253	7.39	10	04/27/2018 21:38	WG1101733
2-Chloronaphthalene	U		0.142	0.733	10	04/27/2018 21:38	WG1101733
4-Chlorophenyl-phenylether	U		0.139	7.39	10	04/27/2018 21:38	WG1101733
Chrysene	U		0.123	0.733	10	04/27/2018 21:38	WG1101733
Dibenz(a,h)anthracene	U		0.182	0.733	10	04/27/2018 21:38	WG1101733
3,3-Dichlorobenzidine	U		1.76	7.39	10	04/27/2018 21:38	WG1101733
2,4-Dinitrotoluene	U		0.135	7.39	10	04/27/2018 21:38	WG1101733
2,6-Dinitrotoluene	U		0.164	7.39	10	04/27/2018 21:38	WG1101733
Fluoranthene	U		0.110	0.733	10	04/27/2018 21:38	WG1101733
Fluorene	U		0.151	0.733	10	04/27/2018 21:38	WG1101733
Hexachlorobenzene	U		0.190	7.39	10	04/27/2018 21:38	WG1101733
Hexachloro-1,3-butadiene	U		0.222	7.39	10	04/27/2018 21:38	WG1101733
Hexachlorocyclopentadiene	U		1.30	7.39	10	04/27/2018 21:38	WG1101733
Hexachloroethane	U		0.297	7.39	10	04/27/2018 21:38	WG1101733
Indeno(1,2,3-cd)pyrene	U		0.171	0.733	10	04/27/2018 21:38	WG1101733
Isophorone	U	J3	0.116	7.39	10	04/27/2018 21:38	WG1101733
Naphthalene	U		0.197	0.733	10	04/27/2018 21:38	WG1101733
Nitrobenzene	U		0.154	7.39	10	04/27/2018 21:38	WG1101733
n-Nitrosodimethylamine	U		1.44	7.39	10	04/27/2018 21:38	WG1101733
n-Nitrosodiphenylamine	U		0.132	7.39	10	04/27/2018 21:38	WG1101733
n-Nitrosodi-n-propylamine	U		0.201	7.39	10	04/27/2018 21:38	WG1101733
Phenanthrene	U		0.117	0.733	10	04/27/2018 21:38	WG1101733
Benzylbutyl phthalate	0.408	J	0.229	7.39	10	04/27/2018 21:38	WG1101733
Bis(2-ethylhexyl)phthalate	0.269	J	0.266	7.39	10	04/27/2018 21:38	WG1101733
Di-n-butyl phthalate	U		0.242	7.39	10	04/27/2018 21:38	WG1101733
Diethyl phthalate	U		0.153	7.39	10	04/27/2018 21:38	WG1101733
Dimethyl phthalate	U		0.120	7.39	10	04/27/2018 21:38	WG1101733
Di-n-octyl phthalate	U		0.201	7.39	10	04/27/2018 21:38	WG1101733
Pyrene	U		0.273	0.733	10	04/27/2018 21:38	WG1101733
1,2,4-Trichlorobenzene	U		0.194	7.39	10	04/27/2018 21:38	WG1101733
4-Chloro-3-methylphenol	U	J3	0.106	7.39	10	04/27/2018 21:38	WG1101733
2-Chlorophenol	U		0.184	7.39	10	04/27/2018 21:38	WG1101733
2,4-Dichlorophenol	U		0.166	7.39	10	04/27/2018 21:38	WG1101733
2,4-Dimethylphenol	U		1.05	7.39	10	04/27/2018 21:38	WG1101733
4,6-Dinitro-2-methylphenol	U		2.75	7.39	10	04/27/2018 21:38	WG1101733

Semi Volatile Organic Compounds (GC/MS) by Method 8270D

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
2,4-Dinitrophenol	U		2.18	7.39	10	04/27/2018 21:38	WG1101733
2-Nitrophenol	U		0.289	7.39	10	04/27/2018 21:38	WG1101733
4-Nitrophenol	U		1.17	7.39	10	04/27/2018 21:38	WG1101733
Pentachlorophenol	U		1.07	7.39	10	04/27/2018 21:38	WG1101733
Phenol	U		0.154	7.39	10	04/27/2018 21:38	WG1101733
2,4,6-Trichlorophenol	U		0.173	7.39	10	04/27/2018 21:38	WG1101733
(S) 2-Fluorophenol	*97.7*			*20.0-120*		*04/27/2018 21:38*	WG1101733
(S) Phenol-d5	*85.7*			*20.0-120*		*04/27/2018 21:38*	WG1101733
(S) Nitrobenzene-d5	*95.1*			*18.0-125*		*04/27/2018 21:38*	WG1101733
(S) 2-Fluorobiphenyl	*85.5*			*28.0-120*		*04/27/2018 21:38*	WG1101733
(S) 2,4,6-Tribromophenol	*82.0*			*17.0-137*		*04/27/2018 21:38*	WG1101733
(S) p-Terphenyl-d14	*91.9*			*13.0-131*		*04/27/2018 21:38*	WG1101733

Sample Narrative:

L987450-03 WG1101733: Dilution due to matrix impact during extract concentration procedure

Semi Volatile Organic Compounds (GC/MS) by Method 8270D-SIM

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Acenaphthene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Acenaphthylene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Benzo(a)anthracene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Benzo(a)pyrene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Benzo(b)fluoranthene	0.00145	J	0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Benzo(g,h,i)perylene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Benzo(k)fluoranthene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Chrysene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Dibenz(a,h)anthracene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Fluoranthene	0.00183	J	0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Fluorene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Indeno(1,2,3-cd)pyrene	U		0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Naphthalene	U		0.00444	0.0444	1	04/24/2018 16:55	WG1101758
Phenanthrene	0.00138	J	0.00133	0.0133	1	04/24/2018 16:55	WG1101758
Pyrene	0.00188	J	0.00133	0.0133	1	04/24/2018 16:55	WG1101758
1-Methylnaphthalene	0.00762	J	0.00444	0.0444	1	04/24/2018 16:55	WG1101758
2-Methylnaphthalene	U		0.00444	0.0444	1	04/24/2018 16:55	WG1101758
2-Chloronaphthalene	U		0.00444	0.0444	1	04/24/2018 16:55	WG1101758
(S) Nitrobenzene-d5	*78.1*			*14.0-149*		*04/24/2018 16:55*	WG1101758
(S) 2-Fluorobiphenyl	*72.2*			*34.0-125*		*04/24/2018 16:55*	WG1101758
(S) p-Terphenyl-d14	*83.8*			*23.0-120*		*04/24/2018 16:55*	WG1101758

Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	%			date / time	
Total Solids	46.8		1	04/24/2018 14:00	WG1101966

Volatile Organic Compounds (GC/MS) by Method 8260B

	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg	mg/kg		date / time	
Acetone	0.275		0.0214	0.107	1	04/20/2018 19:32	WG1101154
Acrylonitrile	U		0.00383	0.0214	1	04/20/2018 19:32	WG1101154
Benzene	0.00111	J	0.000577	0.00214	1	04/20/2018 19:32	WG1101154
Bromobenzene	U		0.000607	0.00214	1	04/20/2018 19:32	WG1101154
Bromodichloromethane	U		0.000543	0.00214	1	04/20/2018 19:32	WG1101154
Bromoform	U		0.000907	0.00214	1	04/20/2018 19:32	WG1101154
Bromomethane	U		0.00286	0.0107	1	04/20/2018 19:32	WG1101154
n-Butylbenzene	U		0.000552	0.00214	1	04/20/2018 19:32	WG1101154
sec-Butylbenzene	U		0.000430	0.00214	1	04/20/2018 19:32	WG1101154
tert-Butylbenzene	U		0.000440	0.00214	1	04/20/2018 19:32	WG1101154
Carbon tetrachloride	U		0.000701	0.00214	1	04/20/2018 19:32	WG1101154
Chlorobenzene	U		0.000453	0.00214	1	04/20/2018 19:32	WG1101154
Chlorodibromomethane	U		0.000797	0.00214	1	04/20/2018 19:32	WG1101154
Chloroethane	U		0.00202	0.0107	1	04/20/2018 19:32	WG1101154
Chloroform	U		0.000490	0.0107	1	04/20/2018 19:32	WG1101154
Chloromethane	U		0.000802	0.00534	1	04/20/2018 19:32	WG1101154
2-Chlorotoluene	U		0.000644	0.00214	1	04/20/2018 19:32	WG1101154
4-Chlorotoluene	U		0.000513	0.00214	1	04/20/2018 19:32	WG1101154
1,2-Dibromo-3-Chloropropane	U		0.00224	0.0107	1	04/20/2018 19:32	WG1101154
1,2-Dibromoethane	U		0.000733	0.00214	1	04/20/2018 19:32	WG1101154
Dibromomethane	U		0.000817	0.00214	1	04/20/2018 19:32	WG1101154
1,2-Dichlorobenzene	U		0.000652	0.00214	1	04/20/2018 19:32	WG1101154
1,3-Dichlorobenzene	U		0.000511	0.00214	1	04/20/2018 19:32	WG1101154
1,4-Dichlorobenzene	U		0.000483	0.00214	1	04/20/2018 19:32	WG1101154
Dichlorodifluoromethane	U		0.00152	0.0107	1	04/20/2018 19:32	WG1101154
1,1-Dichloroethane	U		0.000425	0.00214	1	04/20/2018 19:32	WG1101154
1,2-Dichloroethane	U		0.000567	0.00214	1	04/20/2018 19:32	WG1101154
1,1-Dichloroethene	U		0.000648	0.00214	1	04/20/2018 19:32	WG1101154
cis-1,2-Dichloroethene	U		0.000502	0.00214	1	04/20/2018 19:32	WG1101154
trans-1,2-Dichloroethene	U		0.000564	0.00214	1	04/20/2018 19:32	WG1101154
1,2-Dichloropropane	U		0.000765	0.00214	1	04/20/2018 19:32	WG1101154
1,1-Dichloropropene	U		0.000678	0.00214	1	04/20/2018 19:32	WG1101154
1,3-Dichloropropane	U		0.000443	0.00214	1	04/20/2018 19:32	WG1101154
cis-1,3-Dichloropropene	U		0.000560	0.00214	1	04/20/2018 19:32	WG1101154
trans-1,3-Dichloropropene	U		0.000571	0.00214	1	04/20/2018 19:32	WG1101154
2,2-Dichloropropane	U		0.000597	0.00214	1	04/20/2018 19:32	WG1101154
Di-isopropyl ether	U		0.000530	0.00214	1	04/20/2018 19:32	WG1101154
Ethylbenzene	U		0.000635	0.00214	1	04/20/2018 19:32	WG1101154
Hexachloro-1,3-butadiene	U		0.000731	0.00214	1	04/20/2018 19:32	WG1101154
Isopropylbenzene	U		0.000520	0.00214	1	04/20/2018 19:32	WG1101154
p-Isopropyltoluene	U		0.000436	0.00214	1	04/20/2018 19:32	WG1101154
2-Butanone (MEK)	U		0.0100	0.0214	1	04/20/2018 19:32	WG1101154
Methylene Chloride	U		0.00214	0.0107	1	04/20/2018 19:32	WG1101154
4-Methyl-2-pentanone (MIBK)	0.00474	J	0.00402	0.0214	1	04/20/2018 19:32	WG1101154
Methyl tert-butyl ether	U		0.000453	0.00214	1	04/20/2018 19:32	WG1101154
Naphthalene	U		0.00214	0.0107	1	04/20/2018 19:32	WG1101154
n-Propylbenzene	U		0.000440	0.00214	1	04/20/2018 19:32	WG1101154
Styrene	U		0.000500	0.00214	1	04/20/2018 19:32	WG1101154
1,1,1,2-Tetrachloroethane	U		0.000564	0.00214	1	04/20/2018 19:32	WG1101154
1,1,2,2-Tetrachloroethane	U		0.000780	0.00214	1	04/20/2018 19:32	WG1101154

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	U		0.000780	0.00214	1	04/20/2018 19:32	WG1101154
Tetrachloroethene	U		0.000590	0.00214	1	04/20/2018 19:32	WG1101154
Toluene	U		0.000928	0.0107	1	04/20/2018 19:32	WG1101154
1,2,3-Trichlorobenzene	U		0.000654	0.00214	1	04/20/2018 19:32	WG1101154
1,2,4-Trichlorobenzene	U		0.000830	0.00214	1	04/20/2018 19:32	WG1101154
1,1,1-Trichloroethane	U		0.000611	0.00214	1	04/20/2018 19:32	WG1101154
1,1,2-Trichloroethane	U		0.000592	0.00214	1	04/20/2018 19:32	WG1101154
Trichloroethene	U		0.000597	0.00214	1	04/20/2018 19:32	WG1101154
Trichlorofluoromethane	U		0.000817	0.0107	1	04/20/2018 19:32	WG1101154
1,2,3-Trichloropropane	U		0.00158	0.00534	1	04/20/2018 19:32	WG1101154
1,2,4-Trimethylbenzene	U		0.000451	0.00214	1	04/20/2018 19:32	WG1101154
1,2,3-Trimethylbenzene	U		0.000614	0.00214	1	04/20/2018 19:32	WG1101154
1,3,5-Trimethylbenzene	U		0.000569	0.00214	1	04/20/2018 19:32	WG1101154
Vinyl chloride	U		0.000622	0.00214	1	04/20/2018 19:32	WG1101154
Xylenes, Total	U		0.00149	0.00641	1	04/20/2018 19:32	WG1101154
(S) Toluene-d8	*94.3*			*80.0-120*		*04/20/2018 19:32*	WG1101154
(S) Dibromofluoromethane	*122*			*74.0-131*		*04/20/2018 19:32*	WG1101154
(S) 4-Bromofluorobenzene	*138*	J1		*64.0-132*		*04/20/2018 19:32*	WG1101154

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	62.2		1	04/24/2018 14:00	WG1101966

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.0924		0.0161	0.0803	1	04/20/2018 19:52	WG1101154
Acrylonitrile	U		0.00288	0.0161	1	04/20/2018 19:52	WG1101154
Benzene	0.000823	J	0.000434	0.00161	1	04/20/2018 19:52	WG1101154
Bromobenzene	U		0.000456	0.00161	1	04/20/2018 19:52	WG1101154
Bromodichloromethane	U		0.000408	0.00161	1	04/20/2018 19:52	WG1101154
Bromoform	U		0.000681	0.00161	1	04/20/2018 19:52	WG1101154
Bromomethane	U		0.00215	0.00803	1	04/20/2018 19:52	WG1101154
n-Butylbenzene	U		0.000414	0.00161	1	04/20/2018 19:52	WG1101154
sec-Butylbenzene	U		0.000323	0.00161	1	04/20/2018 19:52	WG1101154
tert-Butylbenzene	U		0.000331	0.00161	1	04/20/2018 19:52	WG1101154
Carbon tetrachloride	U		0.000527	0.00161	1	04/20/2018 19:52	WG1101154
Chlorobenzene	U		0.000341	0.00161	1	04/20/2018 19:52	WG1101154
Chlorodibromomethane	U		0.000599	0.00161	1	04/20/2018 19:52	WG1101154
Chloroethane	U		0.00152	0.00803	1	04/20/2018 19:52	WG1101154
Chloroform	U		0.000368	0.00803	1	04/20/2018 19:52	WG1101154
Chloromethane	U		0.000602	0.00402	1	04/20/2018 19:52	WG1101154
2-Chlorotoluene	U		0.000484	0.00161	1	04/20/2018 19:52	WG1101154
4-Chlorotoluene	U		0.000386	0.00161	1	04/20/2018 19:52	WG1101154
1,2-Dibromo-3-Chloropropane	U		0.00169	0.00803	1	04/20/2018 19:52	WG1101154
1,2-Dibromoethane	U		0.000551	0.00161	1	04/20/2018 19:52	WG1101154
Dibromomethane	U		0.000614	0.00161	1	04/20/2018 19:52	WG1101154
1,2-Dichlorobenzene	U		0.000490	0.00161	1	04/20/2018 19:52	WG1101154
1,3-Dichlorobenzene	U		0.000384	0.00161	1	04/20/2018 19:52	WG1101154
1,4-Dichlorobenzene	U		0.000363	0.00161	1	04/20/2018 19:52	WG1101154
Dichlorodifluoromethane	U		0.00115	0.00803	1	04/20/2018 19:52	WG1101154
1,1-Dichloroethane	U		0.000320	0.00161	1	04/20/2018 19:52	WG1101154
1,2-Dichloroethane	U		0.000426	0.00161	1	04/20/2018 19:52	WG1101154
1,1-Dichloroethene	U		0.000487	0.00161	1	04/20/2018 19:52	WG1101154
cis-1,2-Dichloroethene	U		0.000378	0.00161	1	04/20/2018 19:52	WG1101154
trans-1,2-Dichloroethene	U		0.000424	0.00161	1	04/20/2018 19:52	WG1101154
1,2-Dichloropropane	U		0.000575	0.00161	1	04/20/2018 19:52	WG1101154
1,1-Dichloropropene	U		0.000509	0.00161	1	04/20/2018 19:52	WG1101154
1,3-Dichloropropane	U		0.000333	0.00161	1	04/20/2018 19:52	WG1101154
cis-1,3-Dichloropropene	U		0.000421	0.00161	1	04/20/2018 19:52	WG1101154
trans-1,3-Dichloropropene	U		0.000429	0.00161	1	04/20/2018 19:52	WG1101154
2,2-Dichloropropane	U		0.000448	0.00161	1	04/20/2018 19:52	WG1101154
Di-isopropyl ether	U		0.000398	0.00161	1	04/20/2018 19:52	WG1101154
Ethylbenzene	U		0.000477	0.00161	1	04/20/2018 19:52	WG1101154
Hexachloro-1,3-butadiene	U		0.000549	0.00161	1	04/20/2018 19:52	WG1101154
Isopropylbenzene	U		0.000390	0.00161	1	04/20/2018 19:52	WG1101154
p-Isopropyltoluene	U		0.000328	0.00161	1	04/20/2018 19:52	WG1101154
2-Butanone (MEK)	U		0.00752	0.0161	1	04/20/2018 19:52	WG1101154
Methylene Chloride	U		0.00161	0.00803	1	04/20/2018 19:52	WG1101154
4-Methyl-2-pentanone (MIBK)	U		0.00302	0.0161	1	04/20/2018 19:52	WG1101154
Methyl tert-butyl ether	U		0.000341	0.00161	1	04/20/2018 19:52	WG1101154
Naphthalene	U		0.00161	0.00803	1	04/20/2018 19:52	WG1101154
n-Propylbenzene	U		0.000331	0.00161	1	04/20/2018 19:52	WG1101154
Styrene	U		0.000376	0.00161	1	04/20/2018 19:52	WG1101154
1,1,1,2-Tetrachloroethane	U		0.000424	0.00161	1	04/20/2018 19:52	WG1101154
1,1,2,2-Tetrachloroethane	U		0.000586	0.00161	1	04/20/2018 19:52	WG1101154

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	U		0.000586	0.00161	1	04/20/2018 19:52	WG1101154
Tetrachloroethene	U		0.000443	0.00161	1	04/20/2018 19:52	WG1101154
Toluene	U		0.000697	0.00803	1	04/20/2018 19:52	WG1101154
1,2,3-Trichlorobenzene	U		0.000492	0.00161	1	04/20/2018 19:52	WG1101154
1,2,4-Trichlorobenzene	U		0.000623	0.00161	1	04/20/2018 19:52	WG1101154
1,1,1-Trichloroethane	U		0.000459	0.00161	1	04/20/2018 19:52	WG1101154
1,1,2-Trichloroethane	U		0.000445	0.00161	1	04/20/2018 19:52	WG1101154
Trichloroethene	U		0.000448	0.00161	1	04/20/2018 19:52	WG1101154
Trichlorofluoromethane	U		0.000614	0.00803	1	04/20/2018 19:52	WG1101154
1,2,3-Trichloropropane	U		0.00119	0.00402	1	04/20/2018 19:52	WG1101154
1,2,4-Trimethylbenzene	U		0.000339	0.00161	1	04/20/2018 19:52	WG1101154
1,2,3-Trimethylbenzene	U		0.000461	0.00161	1	04/20/2018 19:52	WG1101154
1,3,5-Trimethylbenzene	U		0.000427	0.00161	1	04/20/2018 19:52	WG1101154
Vinyl chloride	U		0.000467	0.00161	1	04/20/2018 19:52	WG1101154
Xylenes, Total	U		0.00112	0.00482	1	04/20/2018 19:52	WG1101154
(S) Toluene-d8	*99.8*			*80.0-120*		*04/20/2018 19:52*	WG1101154
(S) Dibromofluoromethane	*114*			*74.0-131*		*04/20/2018 19:52*	WG1101154
(S) 4-Bromofluorobenzene	*106*			*64.0-132*		*04/20/2018 19:52*	WG1101154

POND GRID 42

Collected date/time: 04/18/18 13:55

SAMPLE RESULTS - 06

L987450

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	56.8	J3	1	04/23/2018 17:13	WG1101968

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	0.0319	J	0.0176	0.0880	1	04/20/2018 20:12	WG1101154
Acrylonitrile	U		0.00315	0.0176	1	04/20/2018 20:12	WG1101154
Benzene	0.000665	J	0.000475	0.00176	1	04/20/2018 20:12	WG1101154
Bromobenzene	U		0.000500	0.00176	1	04/20/2018 20:12	WG1101154
Bromodichloromethane	U		0.000447	0.00176	1	04/20/2018 20:12	WG1101154
Bromoform	U		0.000746	0.00176	1	04/20/2018 20:12	WG1101154
Bromomethane	U		0.00236	0.00880	1	04/20/2018 20:12	WG1101154
n-Butylbenzene	U		0.000454	0.00176	1	04/20/2018 20:12	WG1101154
sec-Butylbenzene	U		0.000354	0.00176	1	04/20/2018 20:12	WG1101154
tert-Butylbenzene	U		0.000363	0.00176	1	04/20/2018 20:12	WG1101154
Carbon tetrachloride	U		0.000577	0.00176	1	04/20/2018 20:12	WG1101154
Chlorobenzene	U		0.000373	0.00176	1	04/20/2018 20:12	WG1101154
Chlorodibromomethane	U		0.000657	0.00176	1	04/20/2018 20:12	WG1101154
Chloroethane	U		0.00167	0.00880	1	04/20/2018 20:12	WG1101154
Chloroform	U		0.000403	0.00880	1	04/20/2018 20:12	WG1101154
Chloromethane	U		0.000660	0.00440	1	04/20/2018 20:12	WG1101154
2-Chlorotoluene	U		0.000530	0.00176	1	04/20/2018 20:12	WG1101154
4-Chlorotoluene	U		0.000422	0.00176	1	04/20/2018 20:12	WG1101154
1,2-Dibromo-3-Chloropropane	U		0.00185	0.00880	1	04/20/2018 20:12	WG1101154
1,2-Dibromoethane	U		0.000604	0.00176	1	04/20/2018 20:12	WG1101154
Dibromomethane	U		0.000672	0.00176	1	04/20/2018 20:12	WG1101154
1,2-Dichlorobenzene	U		0.000537	0.00176	1	04/20/2018 20:12	WG1101154
1,3-Dichlorobenzene	U		0.000421	0.00176	1	04/20/2018 20:12	WG1101154
1,4-Dichlorobenzene	U		0.000398	0.00176	1	04/20/2018 20:12	WG1101154
Dichlorodifluoromethane	U		0.00126	0.00880	1	04/20/2018 20:12	WG1101154
1,1-Dichloroethane	U		0.000350	0.00176	1	04/20/2018 20:12	WG1101154
1,2-Dichloroethane	U		0.000467	0.00176	1	04/20/2018 20:12	WG1101154
1,1-Dichloroethene	U		0.000533	0.00176	1	04/20/2018 20:12	WG1101154
cis-1,2-Dichloroethene	U		0.000414	0.00176	1	04/20/2018 20:12	WG1101154
trans-1,2-Dichloroethene	U		0.000465	0.00176	1	04/20/2018 20:12	WG1101154
1,2-Dichloropropane	U		0.000630	0.00176	1	04/20/2018 20:12	WG1101154
1,1-Dichloropropene	U		0.000558	0.00176	1	04/20/2018 20:12	WG1101154
1,3-Dichloropropane	U		0.000364	0.00176	1	04/20/2018 20:12	WG1101154
cis-1,3-Dichloropropene	U		0.000461	0.00176	1	04/20/2018 20:12	WG1101154
trans-1,3-Dichloropropene	U		0.000470	0.00176	1	04/20/2018 20:12	WG1101154
2,2-Dichloropropane	U		0.000491	0.00176	1	04/20/2018 20:12	WG1101154
Di-isopropyl ether	U		0.000437	0.00176	1	04/20/2018 20:12	WG1101154
Ethylbenzene	U		0.000523	0.00176	1	04/20/2018 20:12	WG1101154
Hexachloro-1,3-butadiene	U		0.000602	0.00176	1	04/20/2018 20:12	WG1101154
Isopropylbenzene	U		0.000428	0.00176	1	04/20/2018 20:12	WG1101154
p-Isopropyltoluene	U		0.000359	0.00176	1	04/20/2018 20:12	WG1101154
2-Butanone (MEK)	U		0.00824	0.0176	1	04/20/2018 20:12	WG1101154
Methylene Chloride	U		0.00176	0.00880	1	04/20/2018 20:12	WG1101154
4-Methyl-2-pentanone (MIBK)	U		0.00331	0.0176	1	04/20/2018 20:12	WG1101154
Methyl tert-butyl ether	U		0.000373	0.00176	1	04/20/2018 20:12	WG1101154
Naphthalene	U		0.00176	0.00880	1	04/20/2018 20:12	WG1101154
n-Propylbenzene	U		0.000363	0.00176	1	04/20/2018 20:12	WG1101154
Styrene	U		0.000412	0.00176	1	04/20/2018 20:12	WG1101154
1,1,1,2-Tetrachloroethane	U		0.000465	0.00176	1	04/20/2018 20:12	WG1101154
1,1,2,2-Tetrachloroethane	U		0.000643	0.00176	1	04/20/2018 20:12	WG1101154

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	U		0.000643	0.00176	1	04/20/2018 20:12	WG1101154
Tetrachloroethene	U		0.000486	0.00176	1	04/20/2018 20:12	WG1101154
Toluene	U		0.000764	0.00880	1	04/20/2018 20:12	WG1101154
1,2,3-Trichlorobenzene	U		0.000539	0.00176	1	04/20/2018 20:12	WG1101154
1,2,4-Trichlorobenzene	U		0.000683	0.00176	1	04/20/2018 20:12	WG1101154
1,1,1-Trichloroethane	U		0.000503	0.00176	1	04/20/2018 20:12	WG1101154
1,1,2-Trichloroethane	U		0.000488	0.00176	1	04/20/2018 20:12	WG1101154
Trichloroethene	U		0.000491	0.00176	1	04/20/2018 20:12	WG1101154
Trichlorofluoromethane	U		0.000672	0.00880	1	04/20/2018 20:12	WG1101154
1,2,3-Trichloropropane	U		0.00130	0.00440	1	04/20/2018 20:12	WG1101154
1,2,4-Trimethylbenzene	U		0.000371	0.00176	1	04/20/2018 20:12	WG1101154
1,2,3-Trimethylbenzene	U		0.000505	0.00176	1	04/20/2018 20:12	WG1101154
1,3,5-Trimethylbenzene	U		0.000468	0.00176	1	04/20/2018 20:12	WG1101154
Vinyl chloride	U		0.000512	0.00176	1	04/20/2018 20:12	WG1101154
Xylenes, Total	U		0.00123	0.00528	1	04/20/2018 20:12	WG1101154
(S) Toluene-d8	*100*			*80.0-120*		*04/20/2018 20:12*	WG1101154
(S) Dibromofluoromethane	*115*			*74.0-131*		*04/20/2018 20:12*	WG1101154
(S) 4-Bromofluorobenzene	*104*			*64.0-132*		*04/20/2018 20:12*	WG1101154

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	19.1		1	04/23/2018 17:13	WG1101968

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Acetone	1.25		0.0596	0.298	1.14	04/20/2018 20:32	WG1101154
Acrylonitrile	U		0.0107	0.0596	1.14	04/20/2018 20:32	WG1101154
Benzene	0.00848		0.00161	0.00596	1.14	04/20/2018 20:32	WG1101154
Bromobenzene	U		0.00169	0.00596	1.14	04/20/2018 20:32	WG1101154
Bromodichloromethane	U		0.00152	0.00596	1.14	04/20/2018 20:32	WG1101154
Bromoform	U		0.00252	0.00596	1.14	04/20/2018 20:32	WG1101154
Bromomethane	U		0.00799	0.0298	1.14	04/20/2018 20:32	WG1101154
n-Butylbenzene	U		0.00154	0.00596	1.14	04/20/2018 20:32	WG1101154
sec-Butylbenzene	U		0.00120	0.00596	1.14	04/20/2018 20:32	WG1101154
tert-Butylbenzene	U		0.00123	0.00596	1.14	04/20/2018 20:32	WG1101154
Carbon tetrachloride	U		0.00195	0.00596	1.14	04/20/2018 20:32	WG1101154
Chlorobenzene	U		0.00126	0.00596	1.14	04/20/2018 20:32	WG1101154
Chlorodibromomethane	U		0.00222	0.00596	1.14	04/20/2018 20:32	WG1101154
Chloroethane	U		0.00564	0.0298	1.14	04/20/2018 20:32	WG1101154
Chloroform	U		0.00136	0.0298	1.14	04/20/2018 20:32	WG1101154
Chloromethane	U		0.00224	0.0149	1.14	04/20/2018 20:32	WG1101154
2-Chlorotoluene	U		0.00179	0.00596	1.14	04/20/2018 20:32	WG1101154
4-Chlorotoluene	U		0.00143	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2-Dibromo-3-Chloropropane	U		0.00627	0.0298	1.14	04/20/2018 20:32	WG1101154
1,2-Dibromoethane	U		0.00204	0.00596	1.14	04/20/2018 20:32	WG1101154
Dibromomethane	U		0.00227	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2-Dichlorobenzene	U		0.00182	0.00596	1.14	04/20/2018 20:32	WG1101154
1,3-Dichlorobenzene	U		0.00142	0.00596	1.14	04/20/2018 20:32	WG1101154
1,4-Dichlorobenzene	U		0.00135	0.00596	1.14	04/20/2018 20:32	WG1101154
Dichlorodifluoromethane	U		0.00425	0.0298	1.14	04/20/2018 20:32	WG1101154
1,1-Dichloroethane	U		0.00119	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2-Dichloroethane	U		0.00158	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1-Dichloroethene	U		0.00180	0.00596	1.14	04/20/2018 20:32	WG1101154
cis-1,2-Dichloroethene	U		0.00140	0.00596	1.14	04/20/2018 20:32	WG1101154
trans-1,2-Dichloroethene	U		0.00157	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2-Dichloropropane	U		0.00213	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1-Dichloropropene	U		0.00189	0.00596	1.14	04/20/2018 20:32	WG1101154
1,3-Dichloropropane	U		0.00123	0.00596	1.14	04/20/2018 20:32	WG1101154
cis-1,3-Dichloropropene	U		0.00156	0.00596	1.14	04/20/2018 20:32	WG1101154
trans-1,3-Dichloropropene	U		0.00159	0.00596	1.14	04/20/2018 20:32	WG1101154
2,2-Dichloropropane	U		0.00166	0.00596	1.14	04/20/2018 20:32	WG1101154
Di-isopropyl ether	U		0.00148	0.00596	1.14	04/20/2018 20:32	WG1101154
Ethylbenzene	U		0.00177	0.00596	1.14	04/20/2018 20:32	WG1101154
Hexachloro-1,3-butadiene	U		0.00204	0.00596	1.14	04/20/2018 20:32	WG1101154
Isopropylbenzene	U		0.00145	0.00596	1.14	04/20/2018 20:32	WG1101154
p-Isopropyltoluene	0.00298	J	0.00121	0.00596	1.14	04/20/2018 20:32	WG1101154
2-Butanone (MEK)	0.0385	J	0.0279	0.0596	1.14	04/20/2018 20:32	WG1101154
Methylene Chloride	U		0.00596	0.0298	1.14	04/20/2018 20:32	WG1101154
4-Methyl-2-pentanone (MIBK)	U		0.0112	0.0596	1.14	04/20/2018 20:32	WG1101154
Methyl tert-butyl ether	U		0.00126	0.00596	1.14	04/20/2018 20:32	WG1101154
Naphthalene	U		0.00596	0.0298	1.14	04/20/2018 20:32	WG1101154
n-Propylbenzene	U		0.00123	0.00596	1.14	04/20/2018 20:32	WG1101154
Styrene	U		0.00139	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1,1,2-Tetrachloroethane	U		0.00157	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1,2,2-Tetrachloroethane	U		0.00217	0.00596	1.14	04/20/2018 20:32	WG1101154

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	U		0.00217	0.00596	1.14	04/20/2018 20:32	WG1101154
Tetrachloroethene	U		0.00165	0.00596	1.14	04/20/2018 20:32	WG1101154
Toluene	U		0.00259	0.0298	1.14	04/20/2018 20:32	WG1101154
1,2,3-Trichlorobenzene	U		0.00182	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2,4-Trichlorobenzene	U		0.00231	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1,1-Trichloroethane	U		0.00170	0.00596	1.14	04/20/2018 20:32	WG1101154
1,1,2-Trichloroethane	U		0.00165	0.00596	1.14	04/20/2018 20:32	WG1101154
Trichloroethene	U		0.00166	0.00596	1.14	04/20/2018 20:32	WG1101154
Trichlorofluoromethane	U		0.00227	0.0298	1.14	04/20/2018 20:32	WG1101154
1,2,3-Trichloropropane	U		0.00441	0.0149	1.14	04/20/2018 20:32	WG1101154
1,2,4-Trimethylbenzene	U		0.00125	0.00596	1.14	04/20/2018 20:32	WG1101154
1,2,3-Trimethylbenzene	U		0.00171	0.00596	1.14	04/20/2018 20:32	WG1101154
1,3,5-Trimethylbenzene	U		0.00158	0.00596	1.14	04/20/2018 20:32	WG1101154
Vinyl chloride	U		0.00173	0.00596	1.14	04/20/2018 20:32	WG1101154
Xylenes, Total	U		0.00416	0.0179	1.14	04/20/2018 20:32	WG1101154
(S) Toluene-d8	*101*			*80.0-120*		*04/20/2018 20:32*	WG1101154
(S) Dibromofluoromethane	*116*			*74.0-131*		*04/20/2018 20:32*	WG1101154
(S) 4-Bromofluorobenzene	*124*			*64.0-132*		*04/20/2018 20:32*	WG1101154

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	04/20/2018 22:23	WG1101237
Acrolein	U		8.87	50.0	1	04/20/2018 22:23	WG1101237
Acrylonitrile	U		1.87	10.0	1	04/20/2018 22:23	WG1101237
Benzene	U		0.331	1.00	1	04/20/2018 22:23	WG1101237
Bromobenzene	U		0.352	1.00	1	04/20/2018 22:23	WG1101237
Bromodichloromethane	U	J4	0.380	1.00	1	04/20/2018 22:23	WG1101237
Bromoform	U		0.469	1.00	1	04/20/2018 22:23	WG1101237
Bromomethane	U		0.866	5.00	1	04/20/2018 22:23	WG1101237
n-Butylbenzene	U		0.361	1.00	1	04/20/2018 22:23	WG1101237
sec-Butylbenzene	U		0.365	1.00	1	04/20/2018 22:23	WG1101237
tert-Butylbenzene	U		0.399	1.00	1	04/20/2018 22:23	WG1101237
Carbon tetrachloride	U		0.379	1.00	1	04/20/2018 22:23	WG1101237
Chlorobenzene	U		0.348	1.00	1	04/20/2018 22:23	WG1101237
Chlorodibromomethane	U		0.327	1.00	1	04/20/2018 22:23	WG1101237
Chloroethane	U		0.453	5.00	1	04/20/2018 22:23	WG1101237
Chloroform	U		0.324	5.00	1	04/20/2018 22:23	WG1101237
Chloromethane	U		0.276	2.50	1	04/20/2018 22:23	WG1101237
2-Chlorotoluene	U		0.375	1.00	1	04/20/2018 22:23	WG1101237
4-Chlorotoluene	U		0.351	1.00	1	04/20/2018 22:23	WG1101237
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	04/20/2018 22:23	WG1101237
1,2-Dibromoethane	U		0.381	1.00	1	04/20/2018 22:23	WG1101237
Dibromomethane	U		0.346	1.00	1	04/20/2018 22:23	WG1101237
1,2-Dichlorobenzene	U		0.349	1.00	1	04/20/2018 22:23	WG1101237
1,3-Dichlorobenzene	U		0.220	1.00	1	04/20/2018 22:23	WG1101237
1,4-Dichlorobenzene	U		0.274	1.00	1	04/20/2018 22:23	WG1101237
Dichlorodifluoromethane	U		0.551	5.00	1	04/20/2018 22:23	WG1101237
1,1-Dichloroethane	U		0.259	1.00	1	04/20/2018 22:23	WG1101237
1,2-Dichloroethane	U		0.361	1.00	1	04/20/2018 22:23	WG1101237
1,1-Dichloroethene	U		0.398	1.00	1	04/20/2018 22:23	WG1101237
cis-1,2-Dichloroethene	U		0.260	1.00	1	04/20/2018 22:23	WG1101237
trans-1,2-Dichloroethene	U		0.396	1.00	1	04/20/2018 22:23	WG1101237
1,2-Dichloropropane	U		0.306	1.00	1	04/20/2018 22:23	WG1101237
1,1-Dichloropropene	U		0.352	1.00	1	04/20/2018 22:23	WG1101237
1,3-Dichloropropane	U		0.366	1.00	1	04/20/2018 22:23	WG1101237
cis-1,3-Dichloropropene	U		0.418	1.00	1	04/20/2018 22:23	WG1101237
trans-1,3-Dichloropropene	U		0.419	1.00	1	04/20/2018 22:23	WG1101237
2,2-Dichloropropane	U		0.321	1.00	1	04/20/2018 22:23	WG1101237
Di-isopropyl ether	U		0.320	1.00	1	04/20/2018 22:23	WG1101237
Ethylbenzene	U		0.384	1.00	1	04/20/2018 22:23	WG1101237
Hexachloro-1,3-butadiene	U		0.256	1.00	1	04/20/2018 22:23	WG1101237
Isopropylbenzene	U		0.326	1.00	1	04/20/2018 22:23	WG1101237
p-Isopropyltoluene	U		0.350	1.00	1	04/20/2018 22:23	WG1101237
2-Butanone (MEK)	U		3.93	10.0	1	04/20/2018 22:23	WG1101237
Methylene Chloride	U		1.00	5.00	1	04/20/2018 22:23	WG1101237
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	04/20/2018 22:23	WG1101237
Methyl tert-butyl ether	U		0.367	1.00	1	04/20/2018 22:23	WG1101237
Naphthalene	U	J4	1.00	5.00	1	04/20/2018 22:23	WG1101237
n-Propylbenzene	U		0.349	1.00	1	04/20/2018 22:23	WG1101237
Styrene	U		0.307	1.00	1	04/20/2018 22:23	WG1101237
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	04/20/2018 22:23	WG1101237
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	04/20/2018 22:23	WG1101237
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	04/20/2018 22:23	WG1101237
Tetrachloroethene	U		0.372	1.00	1	04/20/2018 22:23	WG1101237
Toluene	U		0.412	1.00	1	04/20/2018 22:23	WG1101237
1,2,3-Trichlorobenzene	U		0.230	1.00	1	04/20/2018 22:23	WG1101237
1,2,4-Trichlorobenzene	U		0.355	1.00	1	04/20/2018 22:23	WG1101237

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	U		0.319	1.00	1	04/20/2018 22:23	WG1101237
1,1,2-Trichloroethane	U		0.383	1.00	1	04/20/2018 22:23	WG1101237
Trichloroethene	U		0.398	1.00	1	04/20/2018 22:23	WG1101237
Trichlorofluoromethane	U		1.20	5.00	1	04/20/2018 22:23	WG1101237
1,2,3-Trichloropropane	U		0.807	2.50	1	04/20/2018 22:23	WG1101237
1,2,4-Trimethylbenzene	U		0.373	1.00	1	04/20/2018 22:23	WG1101237
1,2,3-Trimethylbenzene	U		0.321	1.00	1	04/20/2018 22:23	WG1101237
1,3,5-Trimethylbenzene	U		0.387	1.00	1	04/20/2018 22:23	WG1101237
Vinyl chloride	U		0.259	1.00	1	04/20/2018 22:23	WG1101237
Xylenes, Total	U		1.06	3.00	1	04/20/2018 22:23	WG1101237
(S) Toluene-d8	*107*			*80.0-120*		*04/20/2018 22:23*	WG1101237
(S) Dibromofluoromethane	*100*			*76.0-123*		*04/20/2018 22:23*	WG1101237
(S) 4-Bromofluorobenzene	*110*			*80.0-120*		*04/20/2018 22:23*	WG1101237

Method Blank (MB)

(MB) R3304442-1 04/24/18 14:00

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L987445-10 Original Sample (OS) • Duplicate (DUP)

(OS) L987445-10 04/24/18 14:00 • (DUP) R3304442-3 04/24/18 14:00

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	98.0	97.8	1	0.146		5

Laboratory Control Sample (LCS)

(LCS) R3304442-2 04/24/18 14:00

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3304113-1 04/23/18 17:13

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L987450-06 Original Sample (OS) • Duplicate (DUP)

(OS) L987450-06 04/23/18 17:13 • (DUP) R3304113-3 04/23/18 17:13

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	56.8	60.3	1	5.99	J3	5

Laboratory Control Sample (LCS)

(LCS) R3304113-2 04/23/18 17:13

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3304849-1 04/25/18 15:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L987075-01 Original Sample (OS) • Duplicate (DUP)

(OS) L987075-01 04/25/18 15:31 • (DUP) R3304849-4 04/25/18 15:40

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	1.19	1.46	1	20.2	J P1	20

L987450-03 Original Sample (OS) • Duplicate (DUP)

(OS) L987450-03 04/25/18 19:01 • (DUP) R3304849-10 04/25/18 19:07

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	17.9	19.6	10	8.95	J	20

Sample Narrative:

OS: DILUTION DUE TO MATRIX INTERFERENCE

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304849-2 04/25/18 15:14 • (LCSD) R3304849-3 04/25/18 15:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	10.0	9.11	9.31	91.1	93.1	80.0-120			2.24	20

L987142-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987142-09 04/25/18 16:45 • (MS) R3304849-5 04/25/18 16:51 • (MSD) R3304849-6 04/25/18 16:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	21.9	58.1	99.4	100	189	192	1	75.0-125	E J5	E J5	0.649	20

L987142-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L987142-09 04/25/18 16:45 • (MS) R3304849-7 04/25/18 17:03

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	1130	58.1	761	62.4	50	75.0-125	J6

QUALITY CONTROL SUMMARY

L987450-01,02,03

Method Blank (MB)

(MB) R3304693-1 04/25/18 16:34

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Cyanide	U		0.0390	0.250

L987672-15 Original Sample (OS) • Duplicate (DUP)

(OS) L987672-15 04/25/18 17:04 • (DUP) R3304693-7 04/25/18 17:05

	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Cyanide	0.0924	0.115	1	22.2	J P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304693-2 04/25/18 16:35 • (LCSD) R3304693-3 04/25/18 16:36

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Cyanide	2.50	2.52	2.43	101	97.3	50.0-150			3.37	20

L987672-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987672-14 04/25/18 17:01 • (MS) R3304693-5 04/25/18 17:02 • (MSD) R3304693-6 04/25/18 17:03

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Cyanide	3.31	0.110	3.28	3.09	95.8	90.1	1	75.0-125			5.91	20

Method Blank (MB)

(MB) R3304956-1 04/25/18 13:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Fluoride	U		0.261	1.00

L987450-01 Original Sample (OS) • Duplicate (DUP)

(OS) L987450-01 04/25/18 16:51 • (DUP) R3304956-4 04/25/18 17:12

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	3080	3090	20	0.352		15

L987909-03 Original Sample (OS) • Duplicate (DUP)

(OS) L987909-03 04/26/18 00:31 • (DUP) R3304956-7 04/26/18 00:51

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	4.66	6.10	1	26.8	J3	15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304956-2 04/25/18 13:57 • (LCSD) R3304956-3 04/25/18 14:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluoride	20.0	20.9	20.0	104	100	80.0-120			4.12	15

L987837-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987837-05 04/25/18 21:44 • (MS) R3304956-5 04/25/18 22:46 • (MSD) R3304956-6 04/25/18 23:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	50.0	14.0	44.4	43.2	60.7	58.3	1	80.0-120	J6	J6	2.73	15

WG1102647

Mercury by Method 7471A

QUALITY CONTROL SUMMARY

L987450-01,02,03

Method Blank (MB)

(MB) R3304530-1 04/25/18 08:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.00280	0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304530-2 04/25/18 08:45 • (LCSD) R3304530-3 04/25/18 08:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.261	0.260	87.0	86.7	80.0-120			0.253	20

L988001-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L988001-02 04/25/18 08:50 • (MS) R3304530-4 04/25/18 08:52 • (MSD) R3304530-5 04/25/18 08:55

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.300	0.119	0.441	0.581	107	154	1	75.0-125		J3 J5	27.4	20

Method Blank (MB)

(MB) R3304764-1 04/26/18 04:46

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Antimony	U		0.750	2.00
Arsenic	U		0.650	2.00
Barium	U		0.170	0.500
Beryllium	U		0.0700	0.200
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Cobalt	U		0.230	1.00
Copper	U		0.530	2.00
Lead	0.257	J	0.190	0.500
Manganese	U		0.120	1.00
Molybdenum	U		0.160	0.500
Nickel	U		0.490	2.00
Selenium	U		0.740	2.00
Silver	U		0.280	1.00
Thallium	U		0.650	2.00
Vanadium	U		0.240	2.00
Zinc	U		0.590	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304764-2 04/26/18 04:49 • (LCSD) R3304764-3 04/26/18 04:52

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Antimony	100	97.1	93.9	97.1	93.9	80.0-120			3.36	20
Arsenic	100	95.2	92.0	95.2	92.0	80.0-120			3.44	20
Barium	100	103	99.9	103	99.9	80.0-120			3.33	20
Beryllium	100	96.6	93.4	96.6	93.4	80.0-120			3.44	20
Cadmium	100	98.5	95.6	98.5	95.6	80.0-120			3.00	20
Chromium	100	101	98.3	101	98.3	80.0-120			3.10	20
Cobalt	100	103	100	103	100	80.0-120			3.35	20
Copper	100	100	97.0	100	97.0	80.0-120			3.28	20
Lead	100	101	98.1	101	98.1	80.0-120			2.47	20
Manganese	100	99.6	96.4	99.6	96.4	80.0-120			3.25	20
Molybdenum	100	103	99.4	103	99.4	80.0-120			3.66	20
Nickel	100	103	100	103	100	80.0-120			2.90	20
Selenium	100	102	98.7	102	98.7	80.0-120			3.44	20
Silver	20.0	19.2	18.9	96.2	94.6	80.0-120			1.70	20
Thallium	100	103	100	103	100	80.0-120			2.53	20
Vanadium	100	94.6	91.3	94.6	91.3	80.0-120			3.56	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304764-2 04/26/18 04:49 • (LCSD) R3304764-3 04/26/18 04:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Zinc	100	103	99.9	103	99.9	80.0-120			2.94	20

L987450-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987450-02 04/26/18 04:56 • (MS) R3304764-6 04/26/18 05:06 • (MSD) R3304764-7 04/26/18 05:09

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	221	U	66.8	54.1	30.2	24.5	1	75.0-125	J6	J3 J6	21.0	20
Arsenic	221	2.44	90.9	101	40.0	44.6	1	75.0-125	J6	J6	10.6	20
Barium	221	63.6	175	240	50.6	79.8	1	75.0-125	J6	J3	31.1	20
Beryllium	221	0.169	100	134	45.3	60.4	1	75.0-125	J6	J3 J6	28.5	20
Cadmium	221	0.766	109	145	48.8	65.5	1	75.0-125	J6	J3 J6	28.9	20
Chromium	221	44.4	151	299	48.3	115	1	75.0-125	J6	J3	65.6	20
Cobalt	221	12.6	225	241	96.3	103	1	75.0-125			6.45	20
Copper	221	16.9	128	194	50.5	80.4	1	75.0-125	J6	J3	40.9	20
Lead	221	4.11	211	243	93.5	108	1	75.0-125			14.2	20
Manganese	221	72.8	191	321	53.4	113	1	75.0-125	J6	J3	51.0	20
Molybdenum	221	62.9	191	121	58.0	26.2	1	75.0-125	J6	J3 J6	45.0	20
Nickel	221	20.4	233	274	96.4	115	1	75.0-125			15.9	20
Selenium	221	U	104	134	46.9	60.5	1	75.0-125	J6	J3 J6	25.3	20
Silver	44.2	116	117	176	3.52	138	1	75.0-125	J6	J3 J5	40.4	20
Thallium	221	U	193	201	87.3	91.0	1	75.0-125			4.13	20
Vanadium	221	687	719	1090	14.4	182	1	75.0-125	J6	J3 J5	40.9	20
Zinc	221	24.5	143	239	53.8	97.0	1	75.0-125	J6	J3	50.0	20

Method Blank (MB)

(MB) R3304521-3 04/20/18 15:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0100	0.0500
Acrylonitrile	U		0.00179	0.0100
Benzene	U		0.000270	0.00100
Bromobenzene	U		0.000284	0.00100
Bromodichloromethane	U		0.000254	0.00100
Bromoform	U		0.000424	0.00100
Bromomethane	U		0.00134	0.00500
n-Butylbenzene	U		0.000258	0.00100
sec-Butylbenzene	U		0.000201	0.00100
tert-Butylbenzene	U		0.000206	0.00100
Carbon tetrachloride	U		0.000328	0.00100
Chlorobenzene	U		0.000212	0.00100
Chlorodibromomethane	U		0.000373	0.00100
Chloroethane	U		0.000946	0.00500
Chloroform	U		0.000229	0.00500
Chloromethane	U		0.000375	0.00250
2-Chlorotoluene	U		0.000301	0.00100
4-Chlorotoluene	U		0.000240	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00105	0.00500
1,2-Dibromoethane	U		0.000343	0.00100
Dibromomethane	U		0.000382	0.00100
1,2-Dichlorobenzene	U		0.000305	0.00100
1,3-Dichlorobenzene	U		0.000239	0.00100
1,4-Dichlorobenzene	U		0.000226	0.00100
Dichlorodifluoromethane	U		0.000713	0.00500
1,1-Dichloroethane	U		0.000199	0.00100
1,2-Dichloroethane	U		0.000265	0.00100
1,1-Dichloroethene	U		0.000303	0.00100
cis-1,2-Dichloroethene	U		0.000235	0.00100
trans-1,2-Dichloroethene	U		0.000264	0.00100
1,2-Dichloropropane	U		0.000358	0.00100
1,1-Dichloropropene	U		0.000317	0.00100
1,3-Dichloropropane	U		0.000207	0.00100
cis-1,3-Dichloropropene	U		0.000262	0.00100
trans-1,3-Dichloropropene	U		0.000267	0.00100
2,2-Dichloropropane	U		0.000279	0.00100
Di-isopropyl ether	U		0.000248	0.00100
Ethylbenzene	U		0.000297	0.00100
Hexachloro-1,3-butadiene	U		0.000342	0.00100
Isopropylbenzene	U		0.000243	0.00100

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3304521-3 04/20/18 15:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.000204	0.00100
2-Butanone (MEK)	U		0.00468	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00188	0.0100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000206	0.00100
Styrene	U		0.000234	0.00100
1,1,1,2-Tetrachloroethane	U		0.000264	0.00100
1,1,2,2-Tetrachloroethane	U		0.000365	0.00100
Tetrachloroethene	U		0.000276	0.00100
Toluene	U		0.000434	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000365	0.00100
1,2,3-Trichlorobenzene	U		0.000306	0.00100
1,2,4-Trichlorobenzene	U		0.000388	0.00100
1,1,1-Trichloroethane	U		0.000286	0.00100
1,1,2-Trichloroethane	U		0.000277	0.00100
Trichloroethene	U		0.000279	0.00100
Trichlorofluoromethane	U		0.000382	0.00500
1,2,3-Trichloropropane	U		0.000741	0.00250
1,2,3-Trimethylbenzene	U		0.000287	0.00100
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Vinyl chloride	U		0.000291	0.00100
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	*109*			*80.0-120*
(S) Dibromofluoromethane	*104*			*74.0-131*
(S) 4-Bromofluorobenzene	*102*			*64.0-132*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304521-1 04/20/18 14:32 • (LCSD) R3304521-2 04/20/18 14:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.137	0.154	110	123	11.0-160			11.8	23
Acrylonitrile	0.125	0.137	0.146	109	117	61.0-143			6.79	20
Benzene	0.0250	0.0235	0.0256	93.9	103	71.0-124			8.75	20
Bromobenzene	0.0250	0.0231	0.0253	92.3	101	78.0-120			9.33	20
Bromodichloromethane	0.0250	0.0224	0.0247	89.7	98.9	75.0-120			9.80	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304521-1 04/20/18 14:32 • (LCSD) R3304521-2 04/20/18 14:52

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Bromoform	0.0250	0.0218	0.0239	87.3	95.6	65.0-133			9.02	20
Bromomethane	0.0250	0.0228	0.0257	91.2	103	26.0-160			11.9	20
n-Butylbenzene	0.0250	0.0234	0.0254	93.5	102	73.0-126			8.45	20
sec-Butylbenzene	0.0250	0.0240	0.0263	96.0	105	75.0-121			9.22	20
tert-Butylbenzene	0.0250	0.0242	0.0264	96.6	106	74.0-122			8.88	20
Carbon tetrachloride	0.0250	0.0219	0.0245	87.5	97.9	66.0-123			11.2	20
Chlorobenzene	0.0250	0.0248	0.0264	99.1	105	79.0-121			6.23	20
Chlorodibromomethane	0.0250	0.0232	0.0250	92.8	99.8	74.0-128			7.34	20
Chloroethane	0.0250	0.0224	0.0245	89.4	98.0	51.0-147			9.10	20
Chloroform	0.0250	0.0235	0.0257	94.0	103	73.0-123			8.79	20
Chloromethane	0.0250	0.0263	0.0286	105	114	51.0-138			8.22	20
2-Chlorotoluene	0.0250	0.0243	0.0263	97.1	105	72.0-124			8.08	20
4-Chlorotoluene	0.0250	0.0235	0.0258	94.0	103	78.0-120			9.12	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0222	0.0250	88.7	100	65.0-126			12.0	20
1,2-Dibromoethane	0.0250	0.0253	0.0273	101	109	78.0-122			7.67	20
Dibromomethane	0.0250	0.0228	0.0250	91.2	100	79.0-120			9.40	20
1,2-Dichlorobenzene	0.0250	0.0235	0.0256	94.2	103	80.0-120			8.51	20
1,3-Dichlorobenzene	0.0250	0.0233	0.0257	93.1	103	72.0-123			9.84	20
1,4-Dichlorobenzene	0.0250	0.0232	0.0251	92.9	100	77.0-120			7.63	20
Dichlorodifluoromethane	0.0250	0.0242	0.0270	96.9	108	49.0-155			11.0	20
1,1-Dichloroethane	0.0250	0.0258	0.0285	103	114	70.0-128			9.70	20
1,2-Dichloroethane	0.0250	0.0266	0.0291	106	116	69.0-128			8.79	20
1,1-Dichloroethene	0.0250	0.0242	0.0269	96.7	108	63.0-131			10.8	20
cis-1,2-Dichloroethene	0.0250	0.0236	0.0253	94.6	101	74.0-123			6.73	20
trans-1,2-Dichloroethene	0.0250	0.0237	0.0264	94.8	106	72.0-122			10.8	20
1,2-Dichloropropane	0.0250	0.0252	0.0279	101	112	75.0-126			10.4	20
1,1-Dichloropropene	0.0250	0.0246	0.0271	98.3	108	72.0-130			9.71	20
1,3-Dichloropropane	0.0250	0.0253	0.0269	101	108	80.0-121			6.12	20
cis-1,3-Dichloropropene	0.0250	0.0243	0.0257	97.2	103	80.0-125			5.78	20
trans-1,3-Dichloropropene	0.0250	0.0239	0.0254	95.5	102	75.0-129			6.17	20
2,2-Dichloropropane	0.0250	0.0226	0.0245	90.5	98.0	60.0-129			7.92	20
Di-isopropyl ether	0.0250	0.0268	0.0291	107	116	62.0-133			8.31	20
Ethylbenzene	0.0250	0.0240	0.0262	95.9	105	77.0-120			8.97	20
Hexachloro-1,3-butadiene	0.0250	0.0245	0.0271	98.0	109	68.0-128			10.2	20
Isopropylbenzene	0.0250	0.0233	0.0256	93.0	102	75.0-120			9.46	20
p-Isopropyltoluene	0.0250	0.0240	0.0261	95.9	104	74.0-125			8.29	20
2-Butanone (MEK)	0.125	0.137	0.156	110	125	37.0-159			12.7	20
Methylene Chloride	0.0250	0.0241	0.0266	96.4	106	67.0-123			9.74	20
4-Methyl-2-pentanone (MIBK)	0.125	0.137	0.157	110	125	60.0-144			13.0	20
Methyl tert-butyl ether	0.0250	0.0214	0.0237	85.6	94.8	66.0-125			10.2	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304521-1 04/20/18 14:32 • (LCSD) R3304521-2 04/20/18 14:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.0250	0.0219	0.0246	87.8	98.4	64.0-125			11.4	20
n-Propylbenzene	0.0250	0.0234	0.0259	93.6	104	78.0-120			10.2	20
Styrene	0.0250	0.0226	0.0241	90.6	96.4	78.0-124			6.25	20
1,1,1,2-Tetrachloroethane	0.0250	0.0238	0.0258	95.2	103	74.0-124			8.06	20
1,1,2,2-Tetrachloroethane	0.0250	0.0237	0.0263	95.0	105	73.0-120			10.2	20
Tetrachloroethene	0.0250	0.0249	0.0271	99.5	109	70.0-127			8.69	20
Toluene	0.0250	0.0238	0.0256	95.3	102	77.0-120			7.10	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0257	0.0293	103	117	64.0-135			12.9	20
1,2,3-Trichlorobenzene	0.0250	0.0234	0.0257	93.4	103	68.0-126			9.47	20
1,2,4-Trichlorobenzene	0.0250	0.0221	0.0247	88.6	98.7	70.0-127			10.8	20
1,1,1-Trichloroethane	0.0250	0.0234	0.0257	93.5	103	69.0-125			9.58	20
1,1,2-Trichloroethane	0.0250	0.0237	0.0257	94.8	103	78.0-120			7.97	20
Trichloroethene	0.0250	0.0239	0.0261	95.5	104	79.0-120			8.74	20
Trichlorofluoromethane	0.0250	0.0174	0.0201	69.8	80.5	59.0-136			14.3	20
1,2,3-Trichloropropane	0.0250	0.0247	0.0269	98.6	107	73.0-124			8.53	20
1,2,3-Trimethylbenzene	0.0250	0.0225	0.0243	89.9	97.1	76.0-120			7.70	20
1,2,4-Trimethylbenzene	0.0250	0.0213	0.0233	85.1	93.0	75.0-120			8.88	20
1,3,5-Trimethylbenzene	0.0250	0.0231	0.0246	92.3	98.6	75.0-120			6.52	20
Vinyl chloride	0.0250	0.0254	0.0282	102	113	63.0-134			10.3	20
Xylenes, Total	0.0750	0.0724	0.0786	96.5	105	77.0-120			8.21	20
(S) Toluene-d8				*108*	*107*	*80.0-120*				
(S) Dibromofluoromethane				*106*	*107*	*74.0-131*				
(S) 4-Bromofluorobenzene				*99.9*	*99.7*	*64.0-132*				

L987390-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987390-05 04/21/18 00:12 • (MS) R3304521-4 04/21/18 00:32 • (MSD) R3304521-5 04/21/18 00:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	ND	4.59	5.26	147	168	25	10.0-160		J5	13.5	36
Acrylonitrile	0.125	ND	3.78	3.58	121	115	25	14.0-160			5.36	33
Benzene	0.0250	ND	0.642	0.623	103	99.7	25	13.0-146			3.02	27
Bromobenzene	0.0250	ND	0.645	0.652	103	104	25	10.0-149			1.10	33
Bromodichloromethane	0.0250	ND	0.620	0.615	99.2	98.4	25	15.0-142			0.825	28
Bromoform	0.0250	ND	0.542	0.547	86.8	87.5	25	10.0-147			0.800	31
Bromomethane	0.0250	ND	0.483	0.451	77.4	72.1	25	10.0-160			7.00	32
n-Butylbenzene	0.0250	0.441	1.01	1.06	91.7	98.4	25	10.0-154			4.05	37
sec-Butylbenzene	0.0250	0.121	0.719	0.756	95.6	102	25	10.0-151			5.07	36
tert-Butylbenzene	0.0250	0.0613	0.687	0.714	100	104	25	10.0-152			3.90	35

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L987390-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987390-05 04/21/18 00:12 • (MS) R3304521-4 04/21/18 00:32 • (MSD) R3304521-5 04/21/18 00:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Carbon tetrachloride	0.0250	ND	4.39	0.433	702	69.3	25	13.0-140	J5	J3	164	30
Chlorobenzene	0.0250	ND	0.629	0.654	101	105	25	10.0-149			3.86	31
Chlorodibromomethane	0.0250	ND	0.573	0.598	91.6	95.7	25	12.0-147			4.32	29
Chloroethane	0.0250	ND	0.243	0.167	38.8	26.8	25	10.0-159		J3	36.7	33
Chloroform	0.0250	ND	0.645	0.637	103	102	25	18.0-148			1.27	28
Chloromethane	0.0250	ND	0.736	0.710	118	114	25	10.0-146			3.56	29
2-Chlorotoluene	0.0250	ND	0.717	0.723	115	116	25	10.0-151			0.897	35
4-Chlorotoluene	0.0250	ND	0.647	0.665	104	106	25	10.0-150			2.63	35
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.592	0.599	94.7	95.9	25	10.0-149			1.21	34
1,2-Dibromoethane	0.0250	ND	0.619	0.638	99.0	102	25	14.0-145			3.05	28
Dibromomethane	0.0250	ND	0.614	0.607	98.3	97.2	25	18.0-144			1.16	27
1,2-Dichlorobenzene	0.0250	ND	0.652	0.659	104	105	25	10.0-153			1.08	34
1,3-Dichlorobenzene	0.0250	ND	0.640	0.649	102	104	25	10.0-150			1.33	35
1,4-Dichlorobenzene	0.0250	ND	0.629	0.642	101	103	25	10.0-148			2.04	34
Dichlorodifluoromethane	0.0250	ND	0.877	0.840	140	134	25	10.0-160			4.23	30
1,1-Dichloroethane	0.0250	0.970	1.79	1.70	131	117	25	19.0-148			4.81	28
1,2-Dichloroethane	0.0250	ND	0.720	0.696	115	111	25	17.0-147			3.41	27
1,1-Dichloroethene	0.0250	0.692	1.45	1.40	122	113	25	10.0-150			4.06	31
cis-1,2-Dichloroethene	0.0250	0.416	1.10	1.06	110	103	25	16.0-145			3.98	28
trans-1,2-Dichloroethene	0.0250	ND	0.629	0.604	101	96.6	25	11.0-142			4.08	29
1,2-Dichloropropane	0.0250	ND	0.693	0.701	111	112	25	17.0-148			1.05	28
1,1-Dichloropropene	0.0250	ND	0.657	0.627	105	100	25	10.0-150			4.72	30
1,3-Dichloropropane	0.0250	ND	0.651	0.675	104	108	25	16.0-148			3.59	27
cis-1,3-Dichloropropene	0.0250	ND	0.626	0.653	100	105	25	13.0-150			4.28	28
trans-1,3-Dichloropropene	0.0250	ND	0.611	0.625	97.8	100	25	10.0-152			2.22	29
2,2-Dichloropropane	0.0250	ND	0.546	0.531	87.3	85.0	25	16.0-143			2.66	30
Di-isopropyl ether	0.0250	ND	0.749	0.733	120	117	25	16.0-149			2.13	28
Ethylbenzene	0.0250	1.02	1.70	1.73	108	113	25	10.0-147			1.84	31
Hexachloro-1,3-butadiene	0.0250	ND	0.359	0.384	57.4	61.4	25	10.0-154			6.80	40
Isopropylbenzene	0.0250	0.0648	0.703	0.712	102	104	25	10.0-147			1.29	33
p-Isopropyltoluene	0.0250	0.134	0.737	0.760	96.4	100	25	10.0-156			3.02	37
2-Butanone (MEK)	0.125	ND	4.24	4.19	136	134	25	10.0-160			0.978	33
Methylene Chloride	0.0250	ND	0.633	0.635	101	102	25	16.0-139			0.282	29
4-Methyl-2-pentanone (MIBK)	0.125	ND	3.80	3.80	121	122	25	12.0-160			0.132	32
Methyl tert-butyl ether	0.0250	ND	0.639	0.648	102	104	25	21.0-145			1.39	29
Naphthalene	0.0250	2.20	2.92	2.83	115	99.7	25	10.0-153			3.43	36
n-Propylbenzene	0.0250	0.146	0.788	0.791	103	103	25	10.0-151			0.378	34
Styrene	0.0250	ND	0.636	0.648	102	104	25	10.0-155			1.81	34
1,1,1,2-Tetrachloroethane	0.0250	ND	0.607	0.631	97.1	101	25	10.0-147			3.93	30
1,1,2,2-Tetrachloroethane	0.0250	ND	0.752	0.784	120	125	25	10.0-155			4.13	31

L987390-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987390-05 04/21/18 00:12 • (MS) R3304521-4 04/21/18 00:32 • (MSD) R3304521-5 04/21/18 00:52

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.260	0.908	0.915	104	105	25	10.0-144			0.825	32
Toluene	0.0250	ND	0.642	0.658	99.7	102	25	10.0-144			2.55	28
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.762	0.740	118	115	25	10.0-153			2.94	33
1,2,3-Trichlorobenzene	0.0250	ND	0.556	0.545	89.0	87.2	25	10.0-153			2.00	40
1,2,4-Trichlorobenzene	0.0250	ND	0.548	0.539	87.6	86.3	25	10.0-156			1.50	40
1,1,1-Trichloroethane	0.0250	31.6	33.9	32.0	369	68.6	25	18.0-145	E V	E	5.71	29
1,1,2-Trichloroethane	0.0250	ND	0.638	0.652	102	104	25	12.0-151			2.21	28
Trichloroethene	0.0250	11.1	12.5	11.9	217	134	25	11.0-148	E V	E	4.26	29
Trichlorofluoromethane	0.0250	ND	0.306	0.209	48.9	33.5	25	10.0-157		J3	37.4	34
1,2,3-Trichloropropane	0.0250	ND	0.706	0.691	113	111	25	10.0-154			2.10	32
1,2,3-Trimethylbenzene	0.0250	0.838	1.47	1.48	100	102	25	10.0-150			0.736	33
1,2,4-Trimethylbenzene	0.0250	0.993	1.59	1.61	96.3	98.9	25	10.0-151			1.04	34
1,3,5-Trimethylbenzene	0.0250	0.509	1.12	1.15	97.8	102	25	10.0-150			2.30	33
Vinyl chloride	0.0250	ND	0.697	0.655	112	105	25	10.0-150			6.28	29
Xylenes, Total	0.0750	5.68	7.63	7.79	104	113	25	10.0-150			2.08	31
(S) Toluene-d8					*106*	*110*		*80.0-120*				
(S) Dibromofluoromethane					*107*	*105*		*74.0-131*				
(S) 4-Bromofluorobenzene					*114*	*112*		*64.0-132*				

Method Blank (MB)

(MB) R3303689-3 04/20/18 21:23

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		10.0	50.0
Acrolein	U		8.87	50.0
Acrylonitrile	U		1.87	10.0
Benzene	U		0.331	1.00
Bromobenzene	U		0.352	1.00
Bromodichloromethane	U		0.380	1.00
Bromoform	U		0.469	1.00
Bromomethane	U		0.866	5.00
n-Butylbenzene	U		0.361	1.00
sec-Butylbenzene	U		0.365	1.00
tert-Butylbenzene	U		0.399	1.00
Carbon tetrachloride	U		0.379	1.00
Chlorobenzene	U		0.348	1.00
Chlorodibromomethane	U		0.327	1.00
Chloroethane	U		0.453	5.00
Chloroform	U		0.324	5.00
Chloromethane	U		0.276	2.50
2-Chlorotoluene	U		0.375	1.00
4-Chlorotoluene	U		0.351	1.00
1,2-Dibromo-3-Chloropropane	U		1.33	5.00
1,2-Dibromoethane	U		0.381	1.00
Dibromomethane	U		0.346	1.00
1,2-Dichlorobenzene	U		0.349	1.00
1,3-Dichlorobenzene	U		0.220	1.00
1,4-Dichlorobenzene	U		0.274	1.00
Dichlorodifluoromethane	U		0.551	5.00
1,1-Dichloroethane	U		0.259	1.00
1,2-Dichloroethane	U		0.361	1.00
1,1-Dichloroethene	U		0.398	1.00
cis-1,2-Dichloroethene	U		0.260	1.00
trans-1,2-Dichloroethene	U		0.396	1.00
1,2-Dichloropropane	U		0.306	1.00
1,1-Dichloropropene	U		0.352	1.00
1,3-Dichloropropane	U		0.366	1.00
cis-1,3-Dichloropropene	U		0.418	1.00
trans-1,3-Dichloropropene	U		0.419	1.00
2,2-Dichloropropane	U		0.321	1.00
Di-isopropyl ether	U		0.320	1.00
Ethylbenzene	U		0.384	1.00
Hexachloro-1,3-butadiene	U		0.256	1.00

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3303689-3 04/20/18 21:23

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Isopropylbenzene	U		0.326	1.00
p-Isopropyltoluene	U		0.350	1.00
2-Butanone (MEK)	U		3.93	10.0
Methylene Chloride	U		1.00	5.00
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0
Methyl tert-butyl ether	U		0.367	1.00
Naphthalene	U		1.00	5.00
n-Propylbenzene	U		0.349	1.00
Styrene	U		0.307	1.00
1,1,1,2-Tetrachloroethane	U		0.385	1.00
1,1,2,2-Tetrachloroethane	U		0.130	1.00
Tetrachloroethene	U		0.372	1.00
Toluene	U		0.412	1.00
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00
1,2,3-Trichlorobenzene	0.343	J	0.230	1.00
1,2,4-Trichlorobenzene	U		0.355	1.00
1,1,1-Trichloroethane	U		0.319	1.00
1,1,2-Trichloroethane	U		0.383	1.00
Trichloroethene	U		0.398	1.00
Trichlorofluoromethane	U		1.20	5.00
1,2,3-Trichloropropane	U		0.807	2.50
1,2,3-Trimethylbenzene	U		0.321	1.00
1,2,4-Trimethylbenzene	U		0.373	1.00
1,3,5-Trimethylbenzene	U		0.387	1.00
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*108*			*80.0-120*
(S) Dibromofluoromethane	*100*			*76.0-123*
(S) 4-Bromofluorobenzene	*108*			*80.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303689-1 04/20/18 20:23 • (LCSD) R3303689-2 04/20/18 20:43

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	125	106	101	85.0	81.1	10.0-160			4.78	23
Acrolein	125	166	170	132	136	10.0-160			2.73	20
Acrylonitrile	125	150	149	120	119	60.0-142			0.725	20
Benzene	25.0	23.4	23.5	93.8	93.9	69.0-123			0.116	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303689-1 04/20/18 20:23 • (LCSD) R3303689-2 04/20/18 20:43

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromobenzene	25.0	23.3	24.5	93.2	97.9	79.0-120			4.84	20
Bromodichloromethane	25.0	18.8	18.7	75.2	74.7	76.0-120	J4	J4	0.672	20
Bromoform	25.0	20.3	21.1	81.3	84.5	67.0-132			3.84	20
Bromomethane	25.0	15.7	16.9	62.7	67.8	18.0-160			7.85	20
n-Butylbenzene	25.0	23.6	24.2	94.4	97.0	72.0-126			2.71	20
sec-Butylbenzene	25.0	23.3	23.7	93.1	94.7	74.0-121			1.71	20
tert-Butylbenzene	25.0	24.5	24.6	98.0	98.4	75.0-122			0.362	20
Carbon tetrachloride	25.0	19.1	19.0	76.3	75.8	63.0-122			0.691	20
Chlorobenzene	25.0	24.1	23.9	96.2	95.8	79.0-121			0.456	20
Chlorodibromomethane	25.0	21.5	22.0	86.2	88.1	75.0-125			2.28	20
Chloroethane	25.0	21.9	22.9	87.7	91.7	47.0-152			4.53	20
Chloroform	25.0	22.7	22.6	91.0	90.5	72.0-121			0.531	20
Chloromethane	25.0	26.3	25.4	105	101	48.0-139			3.78	20
2-Chlorotoluene	25.0	24.1	25.1	96.5	100	74.0-122			3.81	20
4-Chlorotoluene	25.0	23.3	24.3	93.3	97.1	79.0-120			4.02	20
1,2-Dibromo-3-Chloropropane	25.0	30.6	30.4	122	121	64.0-127			0.591	20
1,2-Dibromoethane	25.0	26.3	25.8	105	103	77.0-123			2.06	20
Dibromomethane	25.0	24.7	24.6	98.8	98.4	78.0-120			0.394	20
1,2-Dichlorobenzene	25.0	25.7	27.0	103	108	80.0-120			4.70	20
1,3-Dichlorobenzene	25.0	24.8	24.7	99.1	98.6	72.0-123			0.478	20
1,4-Dichlorobenzene	25.0	24.6	25.3	98.3	101	77.0-120			3.08	20
Dichlorodifluoromethane	25.0	26.2	26.2	105	105	49.0-155			0.232	20
1,1-Dichloroethane	25.0	22.7	22.7	90.7	90.8	70.0-126			0.175	20
1,2-Dichloroethane	25.0	23.4	23.4	93.7	93.6	67.0-126			0.163	20
1,1-Dichloroethene	25.0	24.6	24.2	98.3	97.0	64.0-129			1.38	20
cis-1,2-Dichloroethene	25.0	22.8	23.0	91.1	92.0	73.0-120			0.993	20
trans-1,2-Dichloroethene	25.0	23.3	23.7	93.4	94.8	71.0-121			1.54	20
1,2-Dichloropropane	25.0	22.3	21.8	89.1	87.4	75.0-125			1.91	20
1,1-Dichloropropene	25.0	25.4	25.3	102	101	71.0-129			0.432	20
1,3-Dichloropropane	25.0	25.1	24.8	100	99.2	80.0-121			1.04	20
cis-1,3-Dichloropropene	25.0	26.1	26.5	104	106	79.0-123			1.36	20
trans-1,3-Dichloropropene	25.0	25.5	24.6	102	98.4	74.0-127			3.72	20
2,2-Dichloropropane	25.0	21.8	21.8	87.0	87.4	60.0-125			0.408	20
Di-isopropyl ether	25.0	20.0	20.1	80.1	80.4	59.0-133			0.355	20
Ethylbenzene	25.0	23.8	23.5	95.1	94.1	77.0-120			1.01	20
Hexachloro-1,3-butadiene	25.0	23.6	24.6	94.5	98.4	64.0-131			4.05	20
Isopropylbenzene	25.0	25.2	25.7	101	103	75.0-120			1.83	20
p-Isopropyltoluene	25.0	23.8	25.0	95.4	100	74.0-126			4.73	20
2-Butanone (MEK)	125	124	121	99.0	96.6	37.0-158			2.48	20
Methylene Chloride	25.0	23.3	23.7	93.0	94.7	66.0-121			1.83	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3303689-1 04/20/18 20:23 • (LCSD) R3303689-2 04/20/18 20:43

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	125	125	120	100	96.2	59.0-143			3.87	20
Methyl tert-butyl ether	25.0	23.0	22.8	92.0	91.3	64.0-123			0.761	20
Naphthalene	25.0	32.2	31.5	129	126	62.0-128	J4		2.23	20
n-Propylbenzene	25.0	25.3	26.4	101	106	79.0-120			4.32	20
Styrene	25.0	24.8	25.0	99.2	100	78.0-124			1.03	20
1,1,1,2-Tetrachloroethane	25.0	21.5	21.8	85.8	87.2	75.0-122			1.59	20
1,1,2,2-Tetrachloroethane	25.0	23.3	25.3	93.1	101	71.0-122			8.34	20
Tetrachloroethene	25.0	25.3	25.0	101	100	70.0-127			1.21	20
Toluene	25.0	23.0	22.9	92.0	91.4	77.0-120			0.671	20
1,1,2-Trichlorotrifluoroethane	25.0	24.4	24.8	97.6	99.2	61.0-136			1.70	20
1,2,3-Trichlorobenzene	25.0	28.4	28.5	113	114	61.0-133			0.419	20
1,2,4-Trichlorobenzene	25.0	25.9	27.1	104	108	69.0-129			4.55	20
1,1,1-Trichloroethane	25.0	21.4	21.8	85.7	87.3	68.0-122			1.82	20
1,1,2-Trichloroethane	25.0	24.0	23.2	95.8	92.6	78.0-120			3.37	20
Trichloroethene	25.0	26.3	25.8	105	103	78.0-120			2.05	20
Trichlorofluoromethane	25.0	24.6	23.3	98.5	93.0	56.0-137			5.70	20
1,2,3-Trichloropropane	25.0	29.0	28.6	116	114	72.0-124			1.49	20
1,2,3-Trimethylbenzene	25.0	24.8	25.3	99.3	101	75.0-120			1.75	20
1,2,4-Trimethylbenzene	25.0	23.2	23.5	92.7	94.1	75.0-120			1.46	20
1,3,5-Trimethylbenzene	25.0	23.6	24.5	94.5	97.9	75.0-120			3.62	20
Vinyl chloride	25.0	26.1	26.1	104	105	64.0-133			0.347	20
Xylenes, Total	75.0	70.0	70.4	93.3	93.9	77.0-120			0.570	20
(S) Toluene-d8				*106*	*106*	*80.0-120*				
(S) Dibromofluoromethane				*99.9*	*99.1*	*76.0-123*				
(S) 4-Bromofluorobenzene				*108*	*110*	*80.0-120*				

Method Blank (MB)

(MB) R3304101-1 04/23/18 13:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.00350	0.0170
PCB 1221	U		0.00537	0.0170
PCB 1232	U		0.00417	0.0170
PCB 1242	U		0.00318	0.0170
PCB 1248	U		0.00315	0.0170
PCB 1254	U		0.00472	0.0170
PCB 1260	U		0.00494	0.0170
(S) Decachlorobiphenyl	*59.3*			*10.0-148*
(S) Tetrachloro-m-xylene	*62.1*			*21.0-146*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304101-2 04/23/18 13:24 • (LCSD) R3304101-3 04/23/18 13:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	0.0890	0.0885	53.4	53.1	37.0-145			0.649	37
PCB 1016	0.167	0.0903	0.0920	54.2	55.2	36.0-141			1.87	35
(S) Decachlorobiphenyl				*49.8*	*47.9*	*10.0-148*				
(S) Tetrachloro-m-xylene				*52.4*	*53.1*	*21.0-146*				

L987126-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987126-05 04/23/18 14:36 • (MS) R3304101-4 04/23/18 14:50 • (MSD) R3304101-5 04/23/18 15:05

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	ND	0.0784	0.0670	47.0	40.2	1	10.0-160			15.7	31
PCB 1016	0.167	ND	0.0796	0.0723	47.7	43.4	1	17.0-160			9.52	30
(S) Decachlorobiphenyl					*42.9*	*35.9*		*10.0-148*				
(S) Tetrachloro-m-xylene					*50.0*	*42.9*		*21.0-146*				

Method Blank (MB)

(MB) R3305120-3 04/26/18 09:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00642	0.0330
Acenaphthylene	U		0.00671	0.0330
Anthracene	U		0.00632	0.0330
Benzidine	U		0.0637	0.333
Benzo(a)anthracene	U		0.00428	0.0330
Benzo(b)fluoranthene	U		0.00695	0.0330
Benzo(k)fluoranthene	U		0.00582	0.0330
Benzo(g,h,i)perylene	U		0.00721	0.0330
Benzo(a)pyrene	U		0.00548	0.0330
Bis(2-chlorethoxy)methane	U		0.00770	0.333
Bis(2-chloroethyl)ether	U		0.00896	0.333
Bis(2-chloroisopropyl)ether	U		0.00760	0.333
4-Bromophenyl-phenylether	U		0.0114	0.333
2-Chloronaphthalene	U		0.00639	0.0330
4-Chlorophenyl-phenylether	U		0.00627	0.333
Chrysene	U		0.00555	0.0330
Dibenz(a,h)anthracene	U		0.00821	0.0330
3,3-Dichlorobenzidine	U		0.0794	0.333
2,4-Dinitrotoluene	U		0.00607	0.333
2,6-Dinitrotoluene	U		0.00737	0.333
Fluoranthene	U		0.00496	0.0330
Fluorene	U		0.00682	0.0330
Hexachlorobenzene	U		0.00856	0.333
Hexachloro-1,3-butadiene	U		0.0100	0.333
Hexachlorocyclopentadiene	U		0.0587	0.333
Hexachloroethane	U		0.0134	0.333
Indeno(1,2,3-cd)pyrene	U		0.00772	0.0330
Isophorone	U		0.00522	0.333
Naphthalene	U		0.00889	0.0330
Nitrobenzene	U		0.00695	0.333
n-Nitrosodimethylamine	U		0.0647	0.333
n-Nitrosodiphenylamine	U		0.00594	0.333
n-Nitrosodi-n-propylamine	U		0.00906	0.333
Phenanthrene	U		0.00528	0.0330
Benzylbutyl phthalate	U		0.0103	0.333
Bis(2-ethylhexyl)phthalate	U		0.0120	0.333
Di-n-butyl phthalate	U		0.0109	0.333
Diethyl phthalate	U		0.00691	0.333
Dimethyl phthalate	U		0.00540	0.333
Di-n-octyl phthalate	U		0.00907	0.333

Method Blank (MB)

(MB) R3305120-3 04/26/18 09:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Pyrene	U		0.0123	0.0330
1,2,4-Trichlorobenzene	U		0.00876	0.333
4-Chloro-3-methylphenol	U		0.00477	0.333
2-Chlorophenol	U		0.00831	0.333
2,4-Dichlorophenol	U		0.00746	0.333
2,4-Dimethylphenol	U		0.0471	0.333
4,6-Dinitro-2-methylphenol	U		0.124	0.333
2,4-Dinitrophenol	U		0.0980	0.333
2-Nitrophenol	U		0.0130	0.333
4-Nitrophenol	U		0.0525	0.333
Pentachlorophenol	U		0.0480	0.333
Phenol	U		0.00695	0.333
2,4,6-Trichlorophenol	U		0.00779	0.333
(S) Nitrobenzene-d5	*73.5*			*18.0-125*
(S) 2-Fluorobiphenyl	*80.5*			*28.0-120*
(S) p-Terphenyl-d14	*92.5*			*13.0-131*
(S) Phenol-d5	*67.0*			*20.0-120*
(S) 2-Fluorophenol	*82.2*			*20.0-120*
(S) 2,4,6-Tribromophenol	*96.1*			*17.0-137*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3305120-1 04/26/18 08:50 • (LCSD) R3305120-2 04/26/18 09:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.667	0.509	0.483	76.3	72.4	47.0-120			5.30	21
Acenaphthylene	0.667	0.504	0.482	75.5	72.2	48.0-120			4.49	21
Anthracene	0.667	0.506	0.468	75.9	70.1	46.0-120			7.90	20
Benzidine	0.667	0.0874	0.103	13.1	15.5	1.00-120			16.5	36
Benzo(a)anthracene	0.667	0.543	0.525	81.4	78.7	46.0-120			3.33	20
Benzo(b)fluoranthene	0.667	0.594	0.541	89.1	81.1	45.0-120			9.38	22
Benzo(k)fluoranthene	0.667	0.550	0.557	82.5	83.5	45.0-120			1.18	23
Benzo(g,h,i)perylene	0.667	0.591	0.567	88.7	85.0	48.0-120			4.24	21
Benzo(a)pyrene	0.667	0.572	0.546	85.8	81.9	46.0-120			4.67	21
Bis(2-chlorethoxy)methane	0.667	0.407	0.328	61.0	49.1	41.0-120			21.5	22
Bis(2-chloroethyl)ether	0.667	0.396	0.369	59.4	55.3	28.0-120			7.25	28
Bis(2-chloroisopropyl)ether	0.667	0.433	0.402	65.0	60.3	40.0-120			7.47	27
4-Bromophenyl-phenylether	0.667	0.588	0.550	88.2	82.4	45.0-120			6.83	20
2-Chloronaphthalene	0.667	0.474	0.462	71.1	69.2	43.0-120			2.65	22

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3305120-1 04/26/18 08:50 • (LCSD) R3305120-2 04/26/18 09:13

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
4-Chlorophenyl-phenylether	0.667	0.534	0.523	80.0	78.5	46.0-120			1.92	21
Chrysene	0.667	0.545	0.524	81.7	78.5	46.0-120			3.95	20
Dibenz(a,h)anthracene	0.667	0.597	0.578	89.6	86.7	47.0-120			3.28	22
3,3-Dichlorobenzidine	0.667	0.503	0.497	75.4	74.5	20.0-130			1.14	24
2,4-Dinitrotoluene	0.667	0.551	0.532	82.6	79.8	48.0-122			3.45	21
2,6-Dinitrotoluene	0.667	0.517	0.491	77.4	73.6	46.0-120			5.07	21
Fluoranthene	0.667	0.566	0.527	84.8	79.1	46.0-120			7.04	20
Fluorene	0.667	0.523	0.513	78.5	76.9	47.0-120			1.98	20
Hexachlorobenzene	0.667	0.618	0.585	92.7	87.7	42.0-120			5.45	20
Hexachloro-1,3-butadiene	0.667	0.509	0.428	76.4	64.1	36.0-120			17.4	26
Hexachlorocyclopentadiene	0.667	0.447	0.434	67.0	65.1	20.0-124			2.78	26
Hexachloroethane	0.667	0.411	0.400	61.6	59.9	32.0-120			2.76	31
Indeno(1,2,3-cd)pyrene	0.667	0.604	0.579	90.5	86.8	48.0-120			4.21	21
Isophorone	0.667	0.427	0.337	64.0	50.6	42.0-120		J3	23.5	21
Naphthalene	0.667	0.451	0.359	67.7	53.9	41.0-120			22.7	24
Nitrobenzene	0.667	0.444	0.352	66.6	52.7	36.0-120			23.2	24
n-Nitrosodimethylamine	0.667	0.438	0.380	65.6	57.0	20.0-120			14.1	31
n-Nitrosodiphenylamine	0.667	0.504	0.471	75.6	70.6	42.0-120			6.79	20
n-Nitrosodi-n-propylamine	0.667	0.432	0.391	64.8	58.6	39.0-120			10.1	23
Phenanthrene	0.667	0.526	0.493	78.9	74.0	45.0-120			6.40	20
Benzylbutyl phthalate	0.667	0.594	0.567	89.1	85.0	41.0-123			4.68	20
Bis(2-ethylhexyl)phthalate	0.667	0.596	0.573	89.4	85.9	41.0-124			3.95	20
Di-n-butyl phthalate	0.667	0.583	0.533	87.5	80.0	44.0-120			8.97	20
Diethyl phthalate	0.667	0.517	0.499	77.6	74.8	46.0-120			3.64	20
Dimethyl phthalate	0.667	0.510	0.494	76.5	74.1	47.0-120			3.18	21
Di-n-octyl phthalate	0.667	0.600	0.581	89.9	87.2	40.0-123			3.14	21
Pyrene	0.667	0.549	0.530	82.3	79.4	45.0-120			3.56	21
1,2,4-Trichlorobenzene	0.667	0.475	0.389	71.2	58.3	40.0-120			19.8	25
4-Chloro-3-methylphenol	0.667	0.514	0.412	77.1	61.8	46.0-120		J3	22.0	20
2-Chlorophenol	0.667	0.456	0.438	68.3	65.6	37.0-120			4.08	27
2,4-Dichlorophenol	0.667	0.518	0.429	77.7	64.3	45.0-120			18.9	21
2,4-Dimethylphenol	0.667	0.478	0.385	71.6	57.8	40.0-120			21.4	22
4,6-Dinitro-2-methylphenol	0.667	0.536	0.494	80.3	74.1	34.0-120			8.07	23
2,4-Dinitrophenol	0.667	0.349	0.343	52.3	51.4	10.0-120			1.83	30
2-Nitrophenol	0.667	0.520	0.419	78.0	62.8	42.0-120			21.5	24
4-Nitrophenol	0.667	0.441	0.417	66.2	62.5	40.0-120			5.77	21
Pentachlorophenol	0.667	0.356	0.343	53.4	51.4	33.0-122			3.70	22
Phenol	0.667	0.392	0.357	58.8	53.6	38.0-120			9.26	25
2,4,6-Trichlorophenol	0.667	0.474	0.445	71.1	66.7	47.0-120			6.46	22
(S) Nitrobenzene-d5				*70.0*	*54.3*	*18.0-125*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3305120-1 04/26/18 08:50 • (LCSD) R3305120-2 04/26/18 09:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
(S) 2-Fluorobiphenyl				*76.2*	*71.3*	*28.0-120*				
(S) p-Terphenyl-d14				*88.1*	*86.4*	*13.0-131*				
(S) Phenol-d5				*63.4*	*59.7*	*20.0-120*				
(S) 2-Fluorophenol				*78.2*	*73.3*	*20.0-120*				
(S) 2,4,6-Tribromophenol				*89.0*	*82.2*	*17.0-137*				

Method Blank (MB)

(MB) R3304814-3 04/24/18 11:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	*83.0*			*14.0-149*
(S) 2-Fluorobiphenyl	*84.5*			*34.0-125*
(S) p-Terphenyl-d14	*91.3*			*23.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304814-1 04/24/18 10:34 • (LCSD) R3304814-2 04/24/18 10:55

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.0753	0.0811	94.1	101	50.0-125			7.49	20
Acenaphthene	0.0800	0.0653	0.0691	81.6	86.4	52.0-120			5.61	20
Acenaphthylene	0.0800	0.0714	0.0667	89.3	83.4	51.0-120			6.84	20
Benzo(a)anthracene	0.0800	0.0672	0.0719	83.9	89.8	46.0-121			6.76	20
Benzo(a)pyrene	0.0800	0.0728	0.0779	91.0	97.4	42.0-121			6.75	20
Benzo(b)fluoranthene	0.0800	0.0676	0.0762	84.5	95.2	42.0-123			12.0	20
Benzo(g,h,i)perylene	0.0800	0.0773	0.0832	96.7	104	43.0-128			7.36	20
Benzo(k)fluoranthene	0.0800	0.0755	0.0778	94.4	97.2	45.0-128			2.91	20
Chrysene	0.0800	0.0710	0.0766	88.7	95.8	48.0-127			7.61	20
Dibenz(a,h)anthracene	0.0800	0.0755	0.0813	94.3	102	43.0-132			7.45	20
Fluoranthene	0.0800	0.0638	0.0698	79.8	87.2	49.0-129			8.90	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3304814-1 04/24/18 10:34 • (LCSD) R3304814-2 04/24/18 10:55

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Fluorene	0.0800	0.0641	0.0631	80.1	78.8	50.0-120			1.65	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0766	0.0823	95.7	103	44.0-131			7.19	20
Naphthalene	0.0800	0.0628	0.0673	78.5	84.1	50.0-120			6.94	20
Phenanthrene	0.0800	0.0721	0.0780	90.1	97.5	48.0-120			7.85	20
Pyrene	0.0800	0.0768	0.0792	96.0	99.0	48.0-135			3.01	20
1-Methylnaphthalene	0.0800	0.0676	0.0687	84.5	85.9	52.0-122			1.69	20
2-Methylnaphthalene	0.0800	0.0677	0.0676	84.7	84.5	52.0-120			0.226	20
2-Chloronaphthalene	0.0800	0.0633	0.0671	79.1	83.9	50.0-120			5.86	20
(S) Nitrobenzene-d5				*83.9*	*87.1*	*14.0-149*				
(S) 2-Fluorobiphenyl				*75.0*	*79.5*	*34.0-125*				
(S) p-Terphenyl-d14				*90.2*	*91.1*	*23.0-120*				

L987239-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987239-01 04/24/18 13:01 • (MS) R3304814-4 04/24/18 13:22 • (MSD) R3304814-5 04/24/18 13:43

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Anthracene	0.0929	U	0.0771	0.0776	83.0	83.5	1	20.0-136			0.647	24
Acenaphthene	0.0929	U	0.0678	0.0681	73.0	73.3	1	29.0-124			0.462	20
Acenaphthylene	0.0929	U	0.0714	0.0726	76.8	78.1	1	35.0-120			1.68	20
Benzo(a)anthracene	0.0929	U	0.0754	0.0768	81.2	82.7	1	13.0-132			1.89	27
Benzo(a)pyrene	0.0929	U	0.0712	0.0729	76.7	78.6	1	14.0-138			2.44	27
Benzo(b)fluoranthene	0.0929	U	0.0711	0.0733	76.5	79.0	1	10.0-129			3.11	31
Benzo(g,h,i)perylene	0.0929	U	0.0687	0.0697	74.0	75.0	1	10.0-133			1.38	30
Benzo(k)fluoranthene	0.0929	U	0.0674	0.0692	72.6	74.6	1	15.0-131			2.65	27
Chrysene	0.0929	U	0.0746	0.0751	80.3	80.9	1	15.0-137			0.731	25
Dibenz(a,h)anthracene	0.0929	U	0.0696	0.0704	74.9	75.8	1	15.0-132			1.19	27
Fluoranthene	0.0929	U	0.0699	0.0698	75.3	75.1	1	13.0-139			0.220	28
Fluorene	0.0929	U	0.0706	0.0724	76.0	77.9	1	27.0-122			2.51	22
Indeno(1,2,3-cd)pyrene	0.0929	U	0.0706	0.0707	76.0	76.2	1	11.0-133			0.208	29
Naphthalene	0.0929	U	0.0672	0.0688	72.3	74.1	1	18.0-136			2.38	21
Phenanthrene	0.0929	U	0.0777	0.0790	83.7	85.1	1	15.0-133			1.67	25
Pyrene	0.0929	U	0.0759	0.0775	81.8	83.4	1	11.0-146			1.99	29
1-Methylnaphthalene	0.0929	U	0.0714	0.0707	76.9	76.1	1	24.0-137			1.06	22
2-Methylnaphthalene	0.0929	U	0.0698	0.0696	75.2	74.9	1	23.0-136			0.392	22
2-Chloronaphthalene	0.0929	U	0.0658	0.0676	70.9	72.8	1	36.0-120			2.73	20
(S) Nitrobenzene-d5					*72.6*	*78.9*		*14.0-149*				
(S) 2-Fluorobiphenyl					*68.6*	*72.4*		*34.0-125*				
(S) p-Terphenyl-d14					*77.5*	*78.7*		*23.0-120*				

L987450-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L987450-01 04/24/18 15:30 • (MS) R3304814-6 04/24/18 15:51 • (MSD) R3304814-7 04/24/18 16:12

	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Anthracene	0.186	U	0.0821	0.119	44.1	64.2	1	20.0-136		J3	37.0	24
Acenaphthene	0.186	U	0.0779	0.111	41.9	59.9	1	29.0-124		J3	35.4	20
Acenaphthylene	0.186	0.00687	0.0900	0.137	44.7	70.0	1	35.0-120		J3	41.6	20
Benzo(a)anthracene	0.186	U	0.0823	0.112	44.2	60.1	1	13.0-132		J3	30.4	27
Benzo(a)pyrene	0.186	0.00756	0.0840	0.120	41.1	60.5	1	14.0-138		J3	35.5	27
Benzo(b)fluoranthene	0.186	U	0.0786	0.115	42.3	61.7	1	10.0-129		J3	37.4	31
Benzo(g,h,i)perylene	0.186	U	0.0738	0.107	39.7	57.6	1	10.0-133		J3	36.9	30
Benzo(k)fluoranthene	0.186	U	0.0825	0.114	44.3	61.2	1	15.0-131		J3	31.9	27
Chrysene	0.186	U	0.0837	0.112	45.0	60.5	1	15.0-137		J3	29.4	25
Dibenz(a,h)anthracene	0.186	U	0.0832	0.119	44.8	63.8	1	15.0-132		J3	35.0	27
Fluoranthene	0.186	0.00183	0.0759	0.101	39.8	53.4	1	13.0-139		J3	28.6	28
Fluorene	0.186	U	0.0823	0.115	44.2	61.6	1	27.0-122		J3	32.8	22
Indeno(1,2,3-cd)pyrene	0.186	U	0.0795	0.112	42.7	60.1	1	11.0-133		J3	33.7	29
Naphthalene	0.186	U	0.0901	0.107	48.5	57.7	1	18.0-136			17.4	21
Phenanthrene	0.186	0.00146	0.0861	0.123	45.5	65.2	1	15.0-133		J3	35.1	25
Pyrene	0.186	0.00152	0.0840	0.128	44.4	67.7	1	11.0-146		J3	41.1	29
1-Methylnaphthalene	0.186	U	0.0822	0.109	44.2	58.7	1	24.0-137		J3	28.2	22
2-Methylnaphthalene	0.186	U	0.0784	0.103	42.2	55.2	1	23.0-136		J3	26.8	22
2-Chloronaphthalene	0.186	U	0.0770	0.0974	41.4	52.3	1	36.0-120		J3	23.3	20
(S) Nitrobenzene-d5					*70.3*	*69.2*		*14.0-149*				
(S) 2-Fluorobiphenyl					*65.2*	*60.3*		*34.0-125*				
(S) p-Terphenyl-d14					*66.2*	*73.2*		*23.0-120*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana [1]	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	n/a
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T 104704245-17-14
Texas [5]	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

Third Party Federal Accreditations

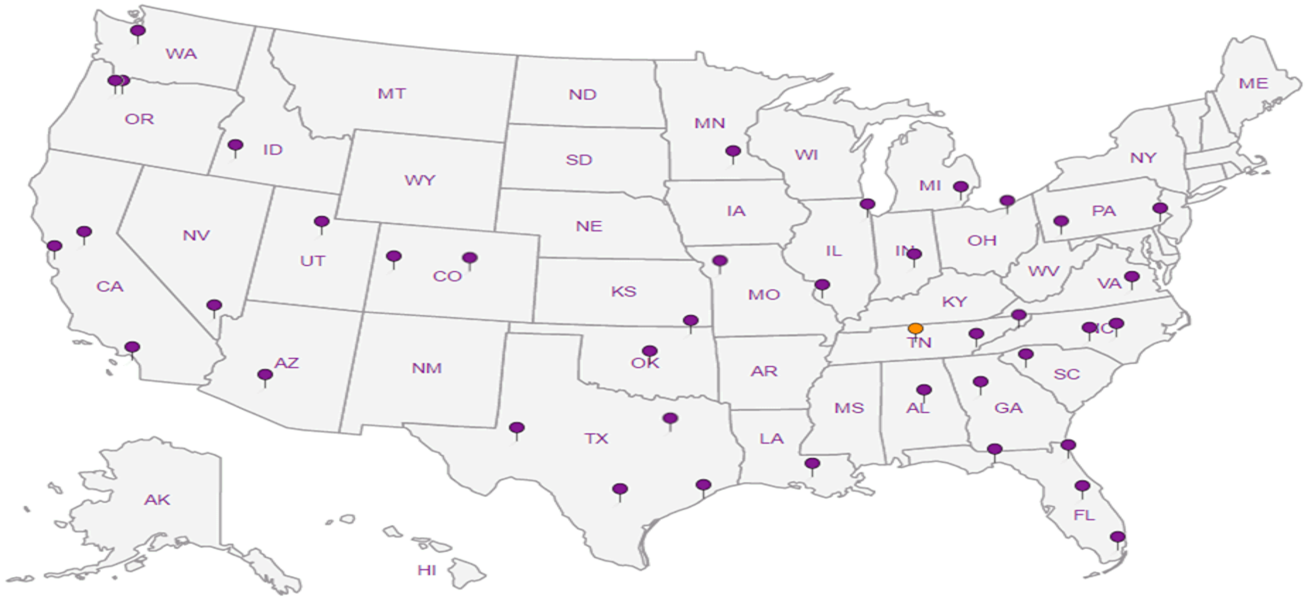
A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003

AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SLR International Corp. - West Linn, OR

1800 Blankenship Road, Suite 440

Billing Information:
~~Accounts Payable~~
~~1800 Blankenship Rd, Ste 440~~
~~West Linn, OR 97068~~
Selmet

Pres Chk

Report to: **Tyler Weber**

Email To: tweber@slrconsulting.com

Project Description: Selmet F006 Delisting

City/State Collected: Albany, OR

Phone: **503-723-4423**
Fax:

Client Project # —

Lab Project # **SLRWLOR-WEBER**

Collected by (print): Tyler Weber

Site/Facility ID # —

P.O. # —

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # —

Date Results Needed —

Chain of Custody Page 1 of 1

ESC LAB SCIENCES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L987450

B022

Acctnum: **SLRWLOR**
Template: **T132913**
Prelogin: **P639719**
TSR: **110 - Brian Ford**
PB:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cyanide, F, Cr6IC 8ozClr-NoPres	SV8082 PCBs 4ozClr-NoPres	SV8270D SVOCs 4ozClr-NoPres	SV8270PAHSIMD LL PAH 4ozClr-NoPres	Total Metals* 2ozClr-NoPres	V8260 VOCs 2ozClr-NoPres	V8260 VOCs 40ml/NaHS04/Syr/MeOH	Remarks	Sample # (lab only)
Pond Composite A	Comp	SS	—	4/18/18	1415	5	X	X	X	X	X				-01
Pond Composite C	Comp	SS	—	4/18/18	1405	5	X	X	X	X	X				-02
Pond Composite D	Comp	SS	—	4/18/18	12:55	5	X	X	X	X	X				-03
Pond Grid 16	Grab	SS	—	4/18/18	13:35	5	~~X~~ TW					X	X		-04
Pond Grid 26	Grab	SS	—	4/18/18	~~1405~~ 13:15 TW	5						X	X		-05
Pond Grid 42	Grab	SS	—	4/18/18	1355	5						X	X		-06
Pond Grid 59	Grab	SS	—	4/18/18	1130	5						X	X		-07
Trip Blank	—	SS	—	4/16/18	—	1							X	Please Run TB for VOCs	-08
		~~SS~~													
		~~SS~~													

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:*Total Metals=please list metals needed here

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier __ ______

Tracking # 4196 3258 7853

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: ✓Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)
Date: 4/19/18
Time: 11:00
Received by: (Signature)

Trip Blank Received: [✓ Yes] / No 1
[✓ HCL] / MeoH
TBR

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)

Temp: 1.1-2 °C
Bottles Received: 35

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature)

Date: 4-20-18
Time: 0845

Hold:

Condition: NCF / [✓ OK]

Brian Ford

From: Tyler Weber <tweber@slrconsulting.com>
Sent: Monday, April 23, 2018 11:12 AM
To: Brian Ford
Subject: RE: ESC Lab Sciences Selmet F006 Delisting L987450

Brian,

Please run the Pond Composite A, C, and D samples for the following metals:

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Manganese
Mercury
Molybdenum
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Thanks,

Tyler

SLR

Tyler Weber, E.I.
Project Engineer
d 503-905-3208
c 503-939-5486
o 503-723-4423
tweber@slrconsulting.com

SLR International Corporation
1800 Blankenship Road, Suite 440, West Linn, OR, 97068

WINNER: International Business Excellence Award, 2016

From: Brian Ford [mailto:BFord@esclabsciences.com]
Sent: April 20, 2018 11:55 AM
To: Tyler Weber
Subject: ESC Lab Sciences Selmet F006 Delisting L987450

Tyler,

See attached COC. Please let me know the list of metals needed.

Thanks,

Brian Ford
Technical Service Representative
ESC Lab Sciences-a subsidiary of Pace Analytical
12065 Lebanon Road | Mt. Juliet, TN 37122
615.773.9772
bford@esclabsciences.com | www.esclabsciences.com

Specialty Analytical
9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 04, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting

Dear Tyler Weber: Order No.: 1804111

Specialty Analytical received 2 sample(s) on 4/13/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804111**

Date: **5/4/2018**

CLIENT: SLR International Corp.

Project: Selmet F006 Delisting

This sample was hand delivered by the client on 4/13/2018 at 12:22.

Notes relating to quality control samples:

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Specialty Analytical

Date Reported: **04-May-18**

CLIENT: SLR International Corp.
Project: Selmet F006 Delisting
Lab ID: 1804111-001
Client Sample ID: Composite B (Pond)

Collection Date: 4/12/2018 4:00:00 PM
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	72.0	0		wt%	1	4/16/2018 3:00:13 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	1290000	31300		µg/Kg-dry	100	4/18/2018 9:21:52 AM

QC SUMMARY REPORT

WO#: **1804111**
18-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**
Client ID: **ICV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342906**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5180	100	5000	0	104	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**
Client ID: **CCV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4960	100	5000	0	99.3	90	110				

Sample ID **LCS-11716** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**
Client ID: **LCSS** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4920	100	5000	0	98.4	80	120				

Sample ID **1804137-001ADUP** SampType: **DUP** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**
Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	ND	960						0	0	20	RF

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_S**

Sample ID **1804137-001AMS** SampType: **MS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**

Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342911**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	6410	925	4626	145.6	136	70	130				SMI

Sample ID **1804137-001AMSD** SampType: **MSD** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**

Client ID: **ZZZZZZ** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342912**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5750	943	4715	145.6	119	70	130	6415	10.9	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**

Client ID: **CCV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342915**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4770	100	5000	0	95.4	90	110				

Sample ID **MB-11716** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/17/2018** RunNo: **25542**

Client ID: **PBS** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	ND	100									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1804111**

18-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_S**

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25542**

Client ID: **CCV** Batch ID: **11716** TestNo: **SW6020A** **SW3050B** Analysis Date: **4/18/2018** SeqNo: **342920**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4800	100	5000	0	96.1	90	110				

Qualifiers:

B Analyte detected in the associated Method Blank

O RSD is greater than RSDlimit

H Holding times for preparation or analysis exceeded

R RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit

S Spike Recovery outside accepted reco

PREP BATCH REPORT

Prep Start Date **4/17/2018 10:00:0**
Prep End Date: **4/17/2018 1:51:25**

Prep Factor Units: **mL / g**

Prep Batch ID **11716** Prep Code **3050_MS** Method No **3050** Technician **Ben Walker**

Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11716		Soil			0.5	0	0	50	100.000	4/17/2018	4/17/2018
LCS-11716		Soil			0.5	0	0	50	100.000	4/17/2018	4/17/2018
1804137-001A	100-2-041418	Unknown			0.514	0	0	50	97.276	4/17/2018	4/17/2018
1804137-001ADUP		Unknown			0.5209	0	0	50	95.988	4/17/2018	4/17/2018
1804137-001AMS		Unknown			0.5404	0	0	50	92.524	4/17/2018	4/17/2018
1804137-001AMSD		Unknown			0.5302	0	0	50	94.304	4/17/2018	4/17/2018
1804111-001A	Composite B (Pond)	Solid			0.5715	0	0	50	87.489	4/17/2018	4/17/2018
1804112-001A	Period 3 Filter Press	Solid			0.5414	0	0	50	92.353	4/17/2018	4/17/2018
1804134-001A	Rinse Water Sludge	Solid			0.5481	0	0	50	91.224	4/17/2018	4/17/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/27/2018 12:00:5**
Prep End Date: **4/27/2018 2:43:00**

Prep Factor Units: **mL / mL**

Prep Batch ID **11781** Prep Code **3010_WMS** Method No **3010** Technician **Julie Clay**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11781		Aqueous			50	0	0	50	1.000	4/27/2018	4/27/2018
LCS-11781		Aqueous			50	0	0	50	1.000	4/27/2018	4/27/2018
1804111-001A	Composite B (Pond)	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001ADUP		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001AMS		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001AMSD		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804112-001A	Period 3 Filter Press	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804238-001C	CE Ground Seep	Groundwater			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001A	Composite B (Pond)	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001ADUP		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001AMS		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001AMSD		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR
Address: 1800 Blankenship Rd, Ste 440
City, State, Zip: West Linn, OR 97068
Telephone: 503-723-4423
Invoice To: Selmet

Date: 4/12/16 Page: 1 of: 1
Project Name: Selmet F006 Delisting
Project No: PO No:
Collected by: Tyler Weber
State Collected: OR ☒ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 1804111
Temperature on Receipt:
Custody Seal: Y [✓ N] - N/A
Shipped Via: Client - SLR
Notes:
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests Total Zirconium	TCLP VOCs and SVOCs	TCLP Fluoride, Hex Chrome, Cyanide and Metals*			VOC	PCBs						Comments
1 ~~Composite A~~			~~SL~~	~~3~~	✓	✓	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
2 Composite B (Pond)	4/12/16	1600	SL	3	✓	✓	✓	☐	☐	☐	⊗	☐	☐	☐	☐	☐	Hold all TCLP tests
3 ~~Composite C~~			~~SL~~	~~3~~	✓	✓	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
4 ~~Composite D~~			~~SL~~	~~3~~	✓	✓	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
5					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	* - metals include; antimony,
6					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	arsenic, barium, beryllium, cadmium,
7					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	chromium, cobalt, copper, lead,
8					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	manganese, mercury, molybdenum,
9					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	nickel, selenium, silver, thallium,
10 Trip Blank			W	4	☐	☐	☐	☐	☐	⊗	☐	☐	☐	☐	☐	☐	vanadium, zinc, and zirconium

⊗ Additional Test per client request EC 4/13/18

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4/12/18 / 20:00
Received x Date/Time

Relinquished x Date/Time
Received x Date/Time 4/13/18 12:22

www.specialtyanalytical.com

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 09, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX

RE: Selmet F006 Delisting

Dear Tyler Weber: Order No.: 1805036

Specialty Analytical received 1 sample(s) on 5/3/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1805036**

Date: **5/9/2018**

CLIENT: SLR International Corp.

Project: Selmet F006 Delisting

This sample was hand delivered by the client on 4/13/2018 at 12:22.

Notes relating to quality control samples:

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

HT flags reported in this batch reflect that samples were analyzed outside of recommended holding time at client's request.

TCLP extracts for the samples in this job were extracted within designated hold times at request of client. Notes stating prep exceeded hold times should be disregarded.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Specialty Analytical

Date Reported: **09-May-18**

CLIENT: SLR International Corp.
Collection Date: 4/12/2018 4:00:00 PM
Project: Selmet F006 Delisting
Lab ID: 1805036-001
Client Sample ID: Composite B (Pond)
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	72.0	0		wt%	1	4/16/2018 3:00:13 PM
TCLP ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **JRC**
Arsenic, TCLP	17.4	5.00		µg/L	10	4/27/2018 5:00:10 PM
Chromium, TCLP	63.2	5.00		µg/L	10	4/27/2018 5:00:10 PM
Selenium, TCLP	65.6	50.0		µg/L	10	4/27/2018 5:00:10 PM
Silver, TCLP	20.8	5.00		µg/L	10	4/27/2018 5:00:10 PM
Thallium TCLP	ND	25.0		µg/L	10	4/30/2018 11:44:17 AM
TCLP SEMIVOLATILE ORGANICS-LOW LEVEL		**SW8270D**				Analyst: **CK**
2,4-Dinitrotoluene, TCLP	ND	12.8		µg/L	1	5/2/2018 6:42:00 PM
2,6-Dinitrotoluene	ND	12.8		µg/L	1	5/2/2018 6:42:00 PM
3,3´-Dichlorobenzidine	ND	12.8		µg/L	1	5/2/2018 6:42:00 PM
Benzidine	ND	5.13		µg/L	1	5/2/2018 6:42:00 PM
Bis(2-chloroethyl)ether	ND	5.13		µg/L	1	5/2/2018 6:42:00 PM
Hexachlorobenzene, TCLP	ND	2.56		µg/L	1	5/2/2018 6:42:00 PM
Hexachlorobutadiene, TCLP	ND	5.13		µg/L	1	5/2/2018 6:42:00 PM
N-Nitrosodimethylamine	ND	2.56		µg/L	1	5/2/2018 6:42:00 PM
N-Nitrosodi-n-propylamine	ND	5.13		µg/L	1	5/2/2018 6:42:00 PM
Pentachlorophenol, TCLP	ND	12.8		µg/L	1	5/2/2018 6:42:00 PM
Surr: 2,4,6-Tribromophenol	80.4	33.1-129.7		%REC	1	5/2/2018 6:42:00 PM
Surr: 2-Fluorobiphenyl	61.1	33.1-126.2		%REC	1	5/2/2018 6:42:00 PM
Surr: 2-Fluorophenol	47.2	13.4-127.1		%REC	1	5/2/2018 6:42:00 PM
Surr: 4-Terphenyl-d14	61.8	41-122		%REC	1	5/2/2018 6:42:00 PM
Surr: Nitrobenzene-d5	64.0	28.9-129.9		%REC	1	5/2/2018 6:42:00 PM
Surr: Phenol-d6	25.5	10.6-128.5		%REC	1	5/2/2018 6:42:00 PM
PCB'S IN SOLIDS		**SW 8082A**				Analyst: **ajr**
Aroclor 1016	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1221	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1232	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1242	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1248	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1254	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1260	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1262	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Aroclor 1268	ND	23.8	HT	µg/Kg-dry	1	5/2/2018 2:54:00 PM
Surr: Decachlorobiphenyl	86.3	56.5-130	HT	%REC	1	5/2/2018 2:54:00 PM

QC SUMMARY REPORT

WO#: **1805036**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **ICV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344557**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	50.1	0.100	50.00	0	100	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Selenium, TCLP	51.7	1.00	50.00	0	103	90	110				
Silver, TCLP	45.9	0.100	50.00	0	91.8	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344560**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Chromium, TCLP	48.2	0.100	50.00	0	96.5	90	110				
Selenium, TCLP	47.3	1.00	50.00	0	94.5	90	110				
Silver, TCLP	45.0	0.100	50.00	0	90.0	90	110				

Sample ID **MB-11781** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **PBW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344561**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805036**
17-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting **TestCode: 6020_TCLP**

Sample ID **LCS-11781** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **LCSW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344562**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	47.8	0.100	50.00	0	95.6	80	120				
Chromium, TCLP	49.6	0.100	50.00	0	99.2	80	120				
Selenium, TCLP	46.8	1.00	50.00	0	93.6	80	120				
Silver, TCLP	46.0	0.100	50.00	0	92.1	80	120				

Sample ID **1805036-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344564**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	5.00						17.43	200	20	RF
Chromium, TCLP	60.3	5.00						63.23	4.80	20	
Selenium, TCLP	ND	50.0						65.56	200	20	RF
Silver, TCLP	19.9	5.00						20.75	4.09	20	

Sample ID **1805036-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344565**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	238	5.00	250.0	17.43	88.2	70	130				
Chromium, TCLP	305	5.00	250.0	63.23	96.5	70	130				
Selenium, TCLP	222	50.0	250.0	65.56	62.6	70	130				SMI
Silver, TCLP	238	5.00	250.0	20.75	86.8	70	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** **6020_TCLP**

Sample ID **1805036-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/27/2018** SeqNo: **344566**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	243	5.00	250.0	17.43	90.1	70	130	238.0	1.91	20	
Chromium, TCLP	309	5.00	250.0	63.23	98.3	70	130	304.6	1.44	20	
Selenium, TCLP	226	50.0	250.0	65.56	64.1	70	130	222.0	1.72	20	SMI
Silver, TCLP	238	5.00	250.0	20.75	87.0	70	130	237.6	0.296	20	

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **ICV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344748**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	50.2	0.500	50.00	0	100	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344749**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	50.7	0.500	50.00	0	101	90	110				

Sample ID **MB-11781** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **PBW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344750**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	ND	0.500									

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting

TestCode: **6020_TCLP**

Sample ID **MB-11781** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **PBW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344750**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID **LCS-11781** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **LCSW** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344751**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	48.7	0.500	50.00	0	97.3	80	120				

Sample ID **1805036-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**
Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344753**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	ND	25.0						0	0	20	RF

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**
Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344754**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	49.5	0.500	50.00	0	99.0	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode: 6020_TCLP**

Sample ID **1805036-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344755**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	236	25.0	250.0	2.250	93.4	70	130				

Sample ID **1805036-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **4/27/2018** RunNo: **25685**

Client ID: **Composite B (Pond)** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344756**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	239	25.0	250.0	2.250	94.7	70	130	239.0	0	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25685**

Client ID: **CCV** Batch ID: **11781** TestNo: **E1311/6020** **SW3010A** Analysis Date: **4/30/2018** SeqNo: **344757**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium TCLP	50.2	0.500	50.00	0	100	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805036**
17-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting **TestCode:** **8082LL_S**

Sample ID **MB-11813** SampType: **MBLK** TestCode: **8082LL_S** Units: **µg/Kg** Prep Date: **5/1/2018** RunNo: **25745**
Client ID: **PBS** Batch ID: **11813** TestNo: **SW 8082A** **SW3550C** Analysis Date: **5/2/2018** SeqNo: **345143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	3.33									
Aroclor 1221	ND	3.33									
Aroclor 1232	ND	3.33									
Aroclor 1242	ND	3.33									
Aroclor 1248	ND	3.33									
Aroclor 1254	ND	3.33									
Aroclor 1260	ND	3.33									
Aroclor 1262	ND	3.33									
Aroclor 1268	ND	3.33									
Surr: Decachlorobiphenyl	5160		6667		77.4	56.5	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805036**

Specialty Analytical

17-May-18

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** 8270LL_W

Sample ID **CCV MSSWS-1517**	SampType: **CCV**	TestCode: **8270LL_W**	Units: **µg/L**		Prep Date:		RunNo: **25769**
Client ID: **CCV**	Batch ID: **11810**	TestNo: **SW8270D**	**SW 3510C**		Analysis Date: **5/2/2018**		SeqNo: **345388**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorobutadiene, TCLP	19.9	0.500	20.00	0	99.4	80	120				
Pentachlorophenol, TCLP	20.2	0.500	20.00	0	101	80	120				

Sample ID **MB-11810**	SampType: **MBLK**	TestCode: **8270LL_W**	Units: **µg/L**		Prep Date: **5/1/2018**		RunNo: **25769**
Client ID: **PBW**	Batch ID: **11810**	TestNo: **SW8270D**	**SW 3510C**		Analysis Date: **5/2/2018**		SeqNo: **345389**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	ND	0.500									
2,6-Dinitrotoluene	ND	0.500									
3,3´-Dichlorobenzidine	ND	0.500									
Bis(2-chloroethyl)ether	ND	0.500									
Hexachlorobenzene, TCLP	ND	0.500									
Hexachlorobutadiene, TCLP	ND	0.500									
N-Nitrosodimethylamine	ND	0.500									
N-Nitrosodi-n-propylamine	ND	0.500									
Pentachlorophenol, TCLP	ND	0.500									
Surr: 2,4,6-Tribromophenol	85.5		100.0		85.5	33.1	129.7				
Surr: 2-Fluorobiphenyl	55.0		100.0		55.0	33.1	126.2				
Surr: 2-Fluorophenol	43.4		100.0		43.4	13.4	127.1				
Surr: 4-Terphenyl-d14	77.1		100.0		77.1	41	122				
Surr: Nitrobenzene-d5	71.6		100.0		71.6	28.9	129.9				
Surr: Phenol-d6	27.7		100.0		27.7	10.6	128.5				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

QC SUMMARY REPORT

WO#: **1805036**

17-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting **TestCode:** 8270LL_W

Sample ID **LCS-11810** SampType: **LCS** TestCode: **8270LL_W** Units: **µg/L** Prep Date: **5/1/2018** RunNo: **25769**

Client ID: **LCSW** Batch ID: **11810** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/2/2018** SeqNo: **345391**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	22.2	0.500	40.00	0	55.5	40	133				
N-Nitrosodi-n-propylamine	24.7	0.500	40.00	0	61.6	33.9	138				
Pentachlorophenol, TCLP	23.3	0.500	40.00	0	58.4	43.3	113				

Sample ID **LCSD-11810** SampType: **LCSD** TestCode: **8270LL_W** Units: **µg/L** Prep Date: **5/1/2018** RunNo: **25769**

Client ID: **LCSS02** Batch ID: **11810** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/2/2018** SeqNo: **345392**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	21.9	0.500	40.00	0	54.7	40	133	22.20	1.41	20	
N-Nitrosodi-n-propylamine	20.6	0.500	40.00	0	51.4	33.9	138	24.66	18.2	20	
Pentachlorophenol, TCLP	20.7	0.500	40.00	0	51.8	43.3	113	23.34	11.9	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **5/1/2018 7:00:38 A**
Prep End Date: **5/2/2018 9:38:57 A**

Prep Factor Units: **mL / L**

Prep Batch ID **11810** Prep Code **3510_B** Method No **3510** Technician **Austin Mobley**

Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11810		Aqueous			1	0	0	1	1.000	5/1/2018	5/2/2018
LCS-11810		Aqueous			1	0	0	1	1.000	5/1/2018	5/2/2018
LCSD-11810		Aqueous			1	0	0	1	1.000	5/1/2018	5/2/2018
1804111-001A	Composite B (Pond)	Solid			0.39	0	0	1	2.564	5/1/2018	5/2/2018
	Prep hold time was exceeded by 11.625 day(s)										
1805036-001A	Composite B (Pond)	Solid			0.39	0	0	1	2.564	5/1/2018	5/2/2018
	Prep hold time was exceeded by 11.625 day(s)										

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **4/27/2018 12:00:5**
Prep End Date: **4/27/2018 2:43:00**

Prep Factor Units: **mL / mL**

Prep Batch ID **11781** Prep Code **3010_WMS** Method No **3010** Technician **Julie Clay**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11781		Aqueous			50	0	0	50	1.000	4/27/2018	4/27/2018
LCS-11781		Aqueous			50	0	0	50	1.000	4/27/2018	4/27/2018
1804111-001A	Composite B (Pond)	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001ADUP		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001AMS		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804111-001AMSD		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804112-001A	Period 3 Filter Press	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1804238-001C	CE Ground Seep	Groundwater			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001A	Composite B (Pond)	Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001ADUP		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001AMS		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018
1805036-001AMSD		Solid			10	0	0	50	5.000	4/27/2018	4/27/2018

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

Specialty Analytical

PREP BATCH REPORT

Prep Start Date **5/1/2018 1:00:47 P**
Prep End Date: **5/2/2018 1:13:00 P**

Prep Factor Units: **mL / Kg**

Prep Batch ID **11813** Prep Code **3550_PCB** Method No **3550** Technician **Austin Mobley**
Initial Temp: **°C** Final Temp **°C**

Sample ID	ClientSampleID	Matrix	pH1	pH2	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
MB-11813		Soil			0.03	0	0	2	66.667	5/1/2018	5/2/2018
LCS-11813		Soil			0.03	0	0	2	66.667	5/1/2018	5/2/2018
1804111-001AMS		Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 day(s)										
1804111-001AMSD		Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 day(s)										
1804111-001A	Composite B (Pond)	Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 day(s)										
1805017-001A	RS-PCB-01	Solid			0.00022	0	0	2	9090.909	5/2/2018	5/2/2018
1805017-002A	RS-PCB-02	Solid			0.00027	0	0	2	7407.407	5/2/2018	5/2/2018
1805036-001A	Composite B (Pond)	Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 day(s)										
1804111-001AMS		Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 days.										
1804111-001AMSD		Solid			0.015	0	0	2	133.333	5/1/2018	5/2/2018
	Prep hold time was exceeded by 4.876 days.										

Type	Chemical / Reagent ID	Chemical / Reagent Name	Container#	Container ID	Amount Added	Amount Unit

Spike ID	Spike Name	Samp Type	Container#	Container ID	Amount Added	Amount Unit

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR
Address: 1800 Blankenship Rd, Ste 440
City, State, Zip: West Linn, OR 97068
Telephone: 503-723-4423
Invoice To: Selmet

Date: 4/12/18 Page: 1 of: 1
Project Name: Selmet F006 Delisting
Project No: PO No:
Collected by: Tyler Weber
State Collected: OR ☒ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 1804111
Temperature on Receipt:
Custody Seal: Y [✓ N] - N/A
Shipped Via: Client - SLR
Notes:
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests												Comments
						Total Zirconium	TCLP VOCs and SVOCs	TCLP Fluoride, Hex Chrome, Cyanide and Metals*			VOC	PCBs						
1	~~Composite A~~			~~SL~~	~~3~~	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
2	Composite B (Pond)	4/12/18	1600	SL	3	☑	☑	☑	☐	☐	☐	⊗	☐	☐	☐	☐	☐	Hold all TCLP tests
3	~~Composite C~~			~~SL~~	~~3~~	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
4	~~Composite D~~			~~SL~~	~~3~~	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~
5						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	* - metals include: antimony,
6						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	arsenic, barium, beryllium, cadmium,
7						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	chromium, cobalt, copper, lead,
8						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	manganese, mercury, molybdenum,
9						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	nickel, selenium, silver, thallium,
10	Trip Blank			W	4	☐	☐	☐	☐	☐	⊗	☐	☐	☐	☐	☐	☐	vanadium, zinc, and zirconium

⊗ Additional test per client request EC 4/13/18

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4/12/18 / 20:00 Received x Date/Time

Relinquished x Date/Time Received x Date/Time 4/13/18 12:22

www.specialtyanalytical.com

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, Oregon 97015
TEL: 503-607-1331 FAX: 503-607-1336
Website: www.specialtyanalytical.com

May 21, 2018

Tyler Weber
SLR International Corp.
1800 Blankenship Rd.
Ste 440
West Linn, OR 97068

TEL: (503) 723-4423
FAX
RE: Selmet F006 Delisting / 108.00256.00029

Dear Tyler Weber: Order No.: 1804173

Specialty Analytical received 8 sample(s) on 4/19/2018 for the analyses presented in the following report.

REVISED REPORT: Please see case narrative for information on revision.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French
Lab Director

Case Narrative

WO#: **1804173**

Date: **5/21/2018**

CLIENT: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029

Notes relating to quality control samples:

B flags reported on QC in this batch reflect results where the sample has a concentration greater then ten times the hit in the method blank. This hit is considered insignificant in relation to the concentration of the sample.

RF flags reported on QC in this batch reflect results where the duplicate failed due to the result being at or near the method reporting limit.

RMI flags reported on QC in this batch reflect RPD results outside control limits due to matrix interference.

SMI flags reported on QC in this batch reflect recovery results outside control limits due to matrix interference. LCS values in this batch are within range.

TCLP extracts for the samples in this job were extracted within designated hold times at request of client. Notes stating prep exceeded hold times should be disregarded.

Revision 1-

This report has been revised to add prep batch reports. Flags have been updated to address QC failures.

Revision 2-

This report has been revised to include values for TCLP Tl on samples 002 & 003, and TCLP Sb on sample 001 per client request.

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp.
Collection Date: 4/18/2018 2:15:00 PM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1804173-001
Client Sample ID: Composite A (Pond)
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	73.5	0		wt%	1	4/19/2018 3:10:51 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	2020000	34100		µg/Kg-dry	100	5/8/2018 11:05:42 AM
ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Antimony TCLP	136	25.0		µg/L	10	5/7/2018 3:56:46 PM
Arsenic, TCLP	21.7	5.00		µg/L	10	5/7/2018 3:56:46 PM
Cadmium, TCLP	ND	5.00		µg/L	10	5/7/2018 3:56:46 PM
Chromium, TCLP	27.8	5.00		µg/L	10	5/7/2018 3:56:46 PM
Selenium, TCLP	94.2	50.0		µg/L	10	5/7/2018 3:56:46 PM
Silver, TCLP	9.85	5.00		µg/L	10	5/7/2018 3:56:46 PM
Thallium TCLP	ND	25.0		µg/L	10	5/7/2018 3:56:46 PM
TCLP SEMIVOLATILE ORGANICS-LOW LEVEL		**SW8270D**				Analyst: **CK**
2,4-Dinitrotoluene, TCLP	ND	21.0		µg/L	1	5/10/2018 6:36:00 PM
2,6-Dinitrotoluene	ND	21.0		µg/L	1	5/10/2018 6:36:00 PM
3,3´-Dichlorobenzidine	ND	21.0		µg/L	1	5/10/2018 6:36:00 PM
Benzidine	ND	8.40		µg/L	1	5/10/2018 6:36:00 PM
Hexachlorobenzene, TCLP	ND	4.20		µg/L	1	5/10/2018 6:36:00 PM
N-Nitrosodimethylamine	ND	4.20		µg/L	1	5/10/2018 6:36:00 PM
N-Nitrosodi-n-propylamine	ND	8.40		µg/L	1	5/10/2018 6:36:00 PM
Pentachlorophenol, TCLP	ND	21.0		µg/L	1	5/10/2018 6:36:00 PM
Surr: 2,4,6-Tribromophenol	100	33.1-129.7		%REC	1	5/10/2018 6:36:00 PM
Surr: 2-Fluorobiphenyl	82.5	33.1-126.2		%REC	1	5/10/2018 6:36:00 PM
Surr: 2-Fluorophenol	76.8	13.4-127.1		%REC	1	5/10/2018 6:36:00 PM
Surr: 4-Terphenyl-d14	88.2	41-122		%REC	1	5/10/2018 6:36:00 PM
Surr: Nitrobenzene-d5	86.7	28.9-129.9		%REC	1	5/10/2018 6:36:00 PM
Surr: Phenol-d6	60.0	10.6-128.5		%REC	1	5/10/2018 6:36:00 PM

CLIENT: SLR International Corp. **Collection Date:** 4/18/2018 2:05:00 PM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1804173-002
Client Sample ID: Composite C (Pond) **Matrix:** SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	61.4	0		wt%	1	4/19/2018 3:10:51 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	803000	21700		µg/Kg-dry	100	5/8/2018 11:10:01 AM
TCLP ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Arsenic, TCLP	ND	5.00		µg/L	10	5/7/2018 4:10:17 PM
Selenium, TCLP	ND	50.0		µg/L	10	5/7/2018 4:10:17 PM
Silver, TCLP	12.1	5.00		µg/L	10	5/7/2018 4:10:17 PM
Thallium TCLP	ND	25.0		µg/L	10	5/7/2018 4:10:17 PM
TCLP SEMIVOLATILE ORGANICS-LOW LEVEL		**SW8270D**				Analyst: **CK**
2,4-Dinitrotoluene, TCLP	ND	13.2		µg/L	1	5/10/2018 7:04:00 PM
2,6-Dinitrotoluene	ND	13.2		µg/L	1	5/10/2018 7:04:00 PM
3,3´-Dichlorobenzidine	ND	13.2		µg/L	1	5/10/2018 7:04:00 PM
Benzidine	ND	5.29		µg/L	1	5/10/2018 7:04:00 PM
Hexachlorobenzene, TCLP	ND	2.65		µg/L	1	5/10/2018 7:04:00 PM
N-Nitrosodimethylamine	ND	2.65		µg/L	1	5/10/2018 7:04:00 PM
N-Nitrosodi-n-propylamine	ND	5.29		µg/L	1	5/10/2018 7:04:00 PM
Pentachlorophenol, TCLP	ND	13.2		µg/L	1	5/10/2018 7:04:00 PM
Surr: 2,4,6-Tribromophenol	95.8	33.1-129.7		%REC	1	5/10/2018 7:04:00 PM
Surr: 2-Fluorobiphenyl	76.7	33.1-126.2		%REC	1	5/10/2018 7:04:00 PM
Surr: 2-Fluorophenol	77.1	13.4-127.1		%REC	1	5/10/2018 7:04:00 PM
Surr: 4-Terphenyl-d14	86.9	41-122		%REC	1	5/10/2018 7:04:00 PM
Surr: Nitrobenzene-d5	89.5	28.9-129.9		%REC	1	5/10/2018 7:04:00 PM
Surr: Phenol-d6	49.7	10.6-128.5		%REC	1	5/10/2018 7:04:00 PM

Specialty Analytical

Date Reported: **21-May-18**

CLIENT: SLR International Corp.
Collection Date: 4/18/2018 12:55:00 PM
Project: Selmet F006 Delisting / 108.00256.00029
Lab ID: 1804173-003
Client Sample ID: Composite D (Pond)
Matrix: SOLID

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE		**D2216**				Analyst: **AM**
Percent Moisture	60.4	0		wt%	1	4/19/2018 3:10:51 PM
ICP/MS METALS-TOTAL RECOVERABLE		**SW6020A**				Analyst: **BW**
Zirconium	1130000	23300		µg/Kg-dry	100	5/8/2018 11:11:05 AM
TCLP ICP/MS METALS-TCLP LEACHED		**E1311/6020**				Analyst: **BW**
Arsenic, TCLP	ND	5.00		µg/L	10	5/7/2018 4:13:40 PM
Selenium, TCLP	ND	50.0		µg/L	10	5/7/2018 4:13:40 PM
Thallium TCLP	ND	25.0		µg/L	10	5/7/2018 4:13:40 PM
TCLP SEMIVOLATILE ORGANICS-LOW LEVEL		**SW8270D**				Analyst: **CK**
2,4-Dinitrotoluene, TCLP	ND	15.5		µg/L	1	5/10/2018 7:31:00 PM
2,6-Dinitrotoluene	ND	15.5		µg/L	1	5/10/2018 7:31:00 PM
3,3´-Dichlorobenzidine	ND	15.5		µg/L	1	5/10/2018 7:31:00 PM
Benzidine	ND	6.19		µg/L	1	5/10/2018 7:31:00 PM
Hexachlorobenzene, TCLP	ND	3.10		µg/L	1	5/10/2018 7:31:00 PM
N-Nitrosodimethylamine	ND	3.10		µg/L	1	5/10/2018 7:31:00 PM
N-Nitrosodi-n-propylamine	ND	6.19		µg/L	1	5/10/2018 7:31:00 PM
Pentachlorophenol, TCLP	ND	15.5		µg/L	1	5/10/2018 7:31:00 PM
Surr: 2,4,6-Tribromophenol	85.1	33.1-129.7		%REC	1	5/10/2018 7:31:00 PM
Surr: 2-Fluorobiphenyl	63.1	33.1-126.2		%REC	1	5/10/2018 7:31:00 PM
Surr: 2-Fluorophenol	60.5	13.4-127.1		%REC	1	5/10/2018 7:31:00 PM
Surr: 4-Terphenyl-d14	69.2	41-122		%REC	1	5/10/2018 7:31:00 PM
Surr: Nitrobenzene-d5	80.1	28.9-129.9		%REC	1	5/10/2018 7:31:00 PM
Surr: Phenol-d6	44.4	10.6-128.5		%REC	1	5/10/2018 7:31:00 PM

QC SUMMARY REPORT

WO#: **1804173**
21-May-18

Specialty Analytical

Client: SLR International Corp.
Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**
Client ID: **ICV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345829**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	5230	100	5000	0	105	90	110				B

Sample ID **MB-11771** SampType: **MBLK** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/26/2018** RunNo: **25809**
Client ID: **PBS** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345830**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	428	100									

Sample ID **LCS-11771** SampType: **LCS** TestCode: **6020_S** Units: **µg/Kg** Prep Date: **4/26/2018** RunNo: **25809**
Client ID: **LCSS** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345831**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4650	100	5000	0	93.0	80	120				B

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**
Client ID: **CCV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345839**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4690	100	5000	0	93.8	90	110				B

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_S**

Sample ID	**1804173-001AMS**	SampType: **MS**	TestCode: **6020_S**	Units: **µg/Kg-dry**	Prep Date: **4/26/2018**	RunNo: **25809**						
Client ID:	**Composite A (Pond)**	Batch ID: **11771**	TestNo: **SW6020A**	**SW3050B**	Analysis Date: **5/8/2018**	SeqNo: **345842**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Zirconium	1990000	34700	17330	2016000	-165	70	130				SMI	

Sample ID	**1804173-001AMSD**	SampType: **MSD**	TestCode: **6020_S**	Units: **µg/Kg-dry**	Prep Date: **4/26/2018**	RunNo: **25809**					
Client ID:	**Composite A (Pond)**	Batch ID: **11771**	TestNo: **SW6020A**	**SW3050B**	Analysis Date: **5/8/2018**	SeqNo: **345843**					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	1600000	36100	18070	2016000	-2280	70	130	1988000	21.4	20	SRMI

Sample ID	**CCV**	SampType: **CCV**	TestCode: **6020_S**	Units: **µg/Kg**	Prep Date:	RunNo: **25809**					
Client ID:	**CCV**	Batch ID: **11771**	TestNo: **SW6020A**	**SW3050B**	Analysis Date: **5/8/2018**	SeqNo: **345847**					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4510	100	5000	0	90.2	90	110				B

Sample ID	**1804173-001ADUP**	SampType: **DUP**	TestCode: **6020_S**	Units: **µg/Kg-dry**	Prep Date: **4/26/2018**	RunNo: **25809**					
Client ID:	**Composite A (Pond)**	Batch ID: **11771**	TestNo: **SW6020A**	**SW3050B**	Analysis Date: **5/8/2018**	SeqNo: **345848**					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	2730000	332000						2016000	30.2	20	RMI

QC SUMMARY REPORT

WO#: **1804173**

21-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_S**

Sample ID **CCV** SampType: **CCV** TestCode: **6020_S** Units: **µg/Kg** Prep Date: RunNo: **25809**

Client ID: **CCV** Batch ID: **11771** TestNo: **SW6020A** **SW3050B** Analysis Date: **5/8/2018** SeqNo: **345849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zirconium	4780	100	5000	0	95.6	90	110				B

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **ICV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345871**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	50.5	0.500	50.00	0	101	90	110				
Arsenic, TCLP	50.7	0.100	50.00	0	101	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Selenium, TCLP	51.7	1.00	50.00	0	103	90	110				
Silver, TCLP	47.3	0.100	50.00	0	94.6	90	110				
Thallium TCLP	47.6	0.500	50.00	0	95.2	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **CCV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345873**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	50.5	0.500	50.00	0	101	90	110				
Arsenic, TCLP	51.8	0.100	50.00	0	104	90	110				
Cadmium, TCLP	52.1	0.100	50.00	0	104	90	110				
Chromium, TCLP	54.6	0.100	50.00	0	109	90	110				
Selenium, TCLP	52.2	1.00	50.00	0	104	90	110				
Silver, TCLP	46.7	0.100	50.00	0	93.3	90	110				
Thallium TCLP	47.2	0.500	50.00	0	94.3	90	110				

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **MB-11850** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **PBW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345874**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	ND	0.500									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									
Thallium TCLP	ND	0.500									

Sample ID **LCS-11850** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **LCSW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345875**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	50.5	0.100	50.00	0	101	80	120				
Cadmium, TCLP	53.3	0.100	50.00	0	107	80	120				
Chromium, TCLP	48.5	0.100	50.00	0	97.0	80	120				
Selenium, TCLP	49.4	1.00	50.00	0	98.9	80	120				
Silver, TCLP	45.6	0.100	50.00	0	91.1	80	120				
Thallium TCLP	47.9	0.500	50.00	0	95.7	80	120				

Sample ID **1804173-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **Composite A (Pond)** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345877**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	68.7	25.0						136.3	65.9	20	R

Qualifiers:						
	B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode: 6020_TCLP**

Sample ID **1804173-001ADUP** SampType: **DUP** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **Composite A (Pond)** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345877**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	6.08	5.00						21.74	113	20	RF
Cadmium, TCLP	ND	5.00						0	0	20	RF
Chromium, TCLP	28.1	5.00						27.75	1.37	20	
Selenium, TCLP	ND	50.0						94.16	200	20	RF
Silver, TCLP	9.80	5.00						9.850	0.479	20	
Thallium TCLP	ND	25.0						0	0	0	

Sample ID **1804173-001AMS** SampType: **MS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **Composite A (Pond)** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345878**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	199	25.0	250.0	136.3	25.1	70	130				SMI
Arsenic, TCLP	268	5.00	250.0	21.74	98.4	70	130				
Cadmium, TCLP	274	5.00	250.0	1.051	109	70	130				
Chromium, TCLP	288	5.00	250.0	27.75	104	70	130				
Selenium, TCLP	260	50.0	250.0	94.16	66.3	70	130				SMI
Silver, TCLP	225	5.00	250.0	9.850	86.1	70	130				
Thallium TCLP	227	25.0	250.0	1.100	90.4	70	130				

Sample ID **1804173-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **Composite A (Pond)** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345879**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **1804173-001AMSD** SampType: **MSD** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **Composite A (Pond)** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/7/2018** SeqNo: **345879**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	196	25.0	250.0	136.3	23.9	70	130	199.0	1.51	20	SMI
Arsenic, TCLP	266	5.00	250.0	21.74	97.7	70	130	267.8	0.634	20	
Cadmium, TCLP	259	5.00	250.0	1.051	103	70	130	273.7	5.41	20	
Chromium, TCLP	288	5.00	250.0	27.75	104	70	130	288.1	0.0972	20	
Selenium, TCLP	266	50.0	250.0	94.16	68.5	70	130	259.8	2.18	20	SMI
Silver, TCLP	226	5.00	250.0	9.850	86.4	70	130	225.1	0.269	20	
Thallium TCLP	228	25.0	250.0	1.100	90.8	70	130	227.0	0.483	20	

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **ICV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/9/2018** SeqNo: **346258**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.5	0.100	50.00	0	99.0	90	110				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **CCV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/9/2018** SeqNo: **346296**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.1	0.100	50.00	0	96.2	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **6020_TCLP**

Sample ID **MB-11850** SampType: **MBLK** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **PBW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/9/2018** SeqNo: **346297**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									

Sample ID **ICV** SampType: **ICV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **ICV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348343**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	45.7	0.500	50.00	0	91.4	90	110				

Sample ID **LCS-11850** SampType: **LCS** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: **5/7/2018** RunNo: **25812**

Client ID: **LCSW** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348344**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	51.4	0.500	50.00	0	103	80	120				

Sample ID **CCV** SampType: **CCV** TestCode: **6020_TCLP** Units: **µg/L** Prep Date: RunNo: **25812**

Client ID: **CCV** Batch ID: **11850** TestNo: **E1311/6020** **SW3010A** Analysis Date: **5/21/2018** SeqNo: **348345**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony TCLP	46.6	0.500	50.00	0	93.2	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **8270LL_W**

Sample ID **CCV MSSWS-1517** SampType: **CCV** TestCode: **8270LL_W** Units: **µg/L** Prep Date: RunNo: **25870**

Client ID: **CCV** Batch ID: **11861** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/9/2018** SeqNo: **346681**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pentachlorophenol, TCLP	17.0	0.500	20.00	0	85.0	80	120				

Sample ID **MB-11861** SampType: **MBLK** TestCode: **8270LL_W** Units: **µg/L** Prep Date: **5/8/2018** RunNo: **25870**

Client ID: **PBW** Batch ID: **11861** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/9/2018** SeqNo: **346682**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	ND	0.500									
2,6-Dinitrotoluene	ND	0.500									
3,3´-Dichlorobenzidine	ND	0.500									
Hexachlorobenzene, TCLP	ND	0.500									
N-Nitrosodimethylamine	ND	0.500									
N-Nitrosodi-n-propylamine	ND	0.500									
Pentachlorophenol, TCLP	ND	0.500									
Surr: 2,4,6-Tribromophenol	59.8		100.0		59.8	33.1	129.7				
Surr: 2-Fluorobiphenyl	64.1		100.0		64.1	33.1	126.2				
Surr: 2-Fluorophenol	50.1		100.0		50.1	13.4	127.1				
Surr: 4-Terphenyl-d14	64.8		100.0		64.8	41	122				
Surr: Nitrobenzene-d5	65.0		100.0		65.0	28.9	129.9				
Surr: Phenol-d6	38.8		100.0		38.8	10.6	128.5				

QC SUMMARY REPORT

WO#: **1804173**

21-May-18

Specialty Analytical

Client: SLR International Corp.

Project: Selmet F006 Delisting / 108.00256.00029 **TestCode:** **8270LL_W**

Sample ID **LCS-11861** SampType: **LCS** TestCode: **8270LL_W** Units: **µg/L** Prep Date: **5/8/2018** RunNo: **25870**

Client ID: **LCSW** Batch ID: **11861** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/9/2018** SeqNo: **346683**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	25.8	0.500	40.00	0	64.5	40	133				
N-Nitrosodi-n-propylamine	28.5	0.500	40.00	0	71.2	33.9	138				
Pentachlorophenol, TCLP	22.9	0.500	40.00	0	57.2	43.3	113				

Sample ID **LCSD-11861** SampType: **LCSD** TestCode: **8270LL_W** Units: **µg/L** Prep Date: **5/8/2018** RunNo: **25870**

Client ID: **LCSS02** Batch ID: **11861** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/9/2018** SeqNo: **346684**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene, TCLP	28.2	0.500	40.00	0	70.6	40	133	25.79	9.07	20	
N-Nitrosodi-n-propylamine	30.3	0.500	40.00	0	75.7	33.9	138	28.48	6.09	20	
Pentachlorophenol, TCLP	25.1	0.500	40.00	0	62.8	43.3	113	22.86	9.34	20	

Sample ID **CCV MSSWS-1517** SampType: **CCV** TestCode: **8270LL_W** Units: **µg/L** Prep Date: RunNo: **25870**

Client ID: **CCV** Batch ID: **11861** TestNo: **SW8270D** **SW 3510C** Analysis Date: **5/10/2018** SeqNo: **346685**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pentachlorophenol, TCLP	21.7	0.500	20.00	0	109	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted reco

KEY TO FLAGS

Rev. May 12, 2010

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
A4	The product appears to be aged or degraded diesel.
B	The blank exhibited a positive result great than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
G	Result may be biased high due to biogenic interferences. Clean up is recommended.
H	Sample was analyzed outside recommended holding time.
HT	At clients request, samples was analyzed outside of recommended holding time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits; post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Client: SLR
Address: 1800 Blankenship Rd, St 440
City, State, Zip: West Linn, OR 97068
Telephone: 503-723-4423
Invoice To: Selmet

Date: 4/19/18
Page: 1 of: ~~8~~ 2 TW
Project Name: Selmet F006 Delisting
Project No: 108.00256.00029 PO No: —
Collected by: Tyler Weber
State Collected: OR ☒ WA ☐ OTHER
Report To (PM): Tyler Weber
PM Email: tweber@slrconsulting.com

Laboratory Project No (internal): 180473
Temperature on Receipt: 7.1
Custody Seal: [✓ Y] N - Cooler
Shipped Via: Client
Notes:
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)

Requested Tests

Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Total Zirconium	TCLP VOCs and SVOCs	TCLP Fluoride, Hex Chrome, Cyanide and Metals*										Comments
1 Composite A (Pond)	4/18/18	1415	SL	3	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Hold all TCLP tests
~~2 Composite B~~			~~SL~~		~~☑~~	~~☑~~	~~☑~~	☐	☐	☐	☐	☐	☐	☐	☐	☐	~~Hold all TCLP tests~~ TW
3 Composite C (Pond)	4/18/18	1405	SL	3	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Hold all TCLP tests
4 Composite D (Pond)	4/18/18	1255	SL	3	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Hold all TCLP tests
5 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	* - metals include: antimony,
6 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	arsenic, barium, beryllium, cadmium,
7 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	chromium, cobalt, copper, lead,
8 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	manganese, mercury, molybdenum,
9 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	nickel, selenium, silver, Thallium,
10 —					☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Vanadium, zinc, and zirconium

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x Date/Time 4/19/18 1150
Received x Date/Time 4/19/18 11:50
Relinquished x Date/Time
Received x Date/Time

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Specialty Analytical
9011 SE Jannsen Rd
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Chain of Custody Record

Date: 4/19/2018
Page: 2 TW of: 2 TW
Laboratory Project No (internal): 1804173
Client: SLR
Project Name: Selmet F006 Delisting
Temperature on Receipt: 7.1
Address: 1800 Blankenship Rd, Suite 440
Project No: 108.00256.00029 PO No: -
Custody Seal: [✓ Y] N -Cooler
City, State, Zip: West Linn, OR, 97068
Collected by: Tyler Weber
Notes: Client
Telephone: 503-723-4423
State Collected: OR ☑ WA ☐ OTHER
Shipped Via:
Invoice To: Selmet
Report To (PM): Tyler Weber
Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 60 days)
PM Email: tweber@slrconsulting.com

	Sample Name	Sample Date	Sample Time	Sample Matrix*	# of Containers	Requested Tests												Comments
						TCLP VOCs*												
1	Pond Grid 16	4/18/2018	1335	SL	1	✓												Wait to Run Analysis*
2	Pond Grid 26	4/18/2018	1315	SL	1	✓												Wait to Run Analysis*
3	Pond Grid 42	4/18/2018	1355	SL	1	✓												Wait to Run Analysis*
4	Pond Grid 59	4/18/2018	1130	SL	1	✓												Wait to Run Analysis*
5	Trip Blank	4/10/18	—	—	1													Hold
6	—																	
7	—																	
8	—																	
9	—																	
10	—																	

*Matrix: A=Air, AQ=Aqueous, O=Other, P=Product, S=Soil, SD=Sediment, SL=Solid, W=Water, DW=Drinking Water, GW=Ground Water, SW=Storm Water, WW=Waste Water **Metals

Turn-around Time: Standard (5-7 Business): ☐ 3 Day: ☐ 2 Day: ☐ Next Day: ☐ Same Day: ☐

Relinquished x
Date/Time 4/19/18 1150
Received x
Date/Time 4/19/18 11:50

Relinquished x
Date/Time
Received x
Date/Time

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APPENDIX I

SELMET MATERIAL SAFETY DATA SHEETS (MSDS)

Selmet MSDSs are included on enclosed Data CD

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APPENDIX J

DRAS ANALYSES FILES

DRAS analyses files are included on enclosed Data CD

State of Oregon Department of Environmental Quality

OAR 340-101-0004

Appendix 2 – Pacific Cast Technologies Petition

F006 HAZARDOUS WASTE DELISTING

Delisting Petition for F006 Hazardous Waste

Prepared for:

Pacific Cast Technologies, Inc. dba ATI Cast Products

April 11, 2019

Delisting Petition for F006 Hazardous Waste

Prepared for:
Pacific Cast Technologies, Inc. dba ATI Cast Products
150 Queen Avenue SW
Albany, OR 97322

This document has been prepared by SLR International Corporation (SLR). The material and data in this report were prepared under the supervision and direction of the undersigned.

SDKronholm

Sarah Kronholm, P.E.
Principal Engineer

Tyler Weber, P.E.
Project Engineer

CONTENTS

EMBEDDED TABLES

ATTACHED TABLES

FIGURES

APPENDICES

ACRONYMS

ATI	Pacific Cast Technologies, Inc. dba ATI Cast Products
CFR	Code of Federal Regulations
Chem Mill	Chemical Milling
CMM	Coordinate-Measuring Machine
COC	Chain of Custody
COPC	Constituent of Potential Concern
DEQ	Department of Environmental Quality
DRAS	Delisting Risk Assessment Software
HDPE	High-Density Polyethylene
HIP	Hot Isostatic Pressing
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
MRL	Method Reporting Limit
Pace	Pace Lab Sciences
POTW	Publicly-Owned Treatment Works
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RDL	Reportable Detection Limits
SAP	Sampling and Analysis Plan
SDS	Safety Data Sheet
SLR	SLR International Corporation
Specialty	Specialty Analytical
TCLP	Toxicity Characteristics Leaching Procedure
TSD	Treatment, Storage, Disposal
USEPA	United States Environmental Protection Agency
WWTS	Wastewater Treatment System
yd^3	Cubic Yards

EXECUTIVE SUMMARY

Pacific Cast Technologies, Inc. dba ATI Cast Products (ATI) is a manufacturer of titanium-alloy castings and machined parts. The facility is located in Albany, Oregon (see Figure 1). ATI uses the investment casting process to produce parts for the aerospace industry. [redacted]

This petition is to delist sludge generated as a result of treating wastewater from ATI's chemical milling operations. To characterize the sludge generated from this process, ATI sampled and analyzed filter press cake for a number of metallic and non-metallic constituents, as described in this document.

Regulatory Background

In 2017, the Oregon Department of Environmental Quality (DEQ) notified ATI that it considers sludges generated as a result of treating wastewater from the ATI chemical milling (Chem Mill) process to be F006 listed hazardous waste, regulated by the Resource Conservation and Recovery Act (RCRA). This petition has been prepared for the DEQ to delist wastewater sludges generated in the Chem Mill process so that they are no longer considered F006 hazardous waste. This material includes the sludge currently generated by the filter press from the onsite wastewater treatment system (WWTS). This petition has been developed in accordance with the following resources:

- Title 40 of the Code of Federal Regulations (CFR), Section 260.22[1];
- *Resource Conservation and Recovery Act Hazardous Waste Delisting Program Useful information for the Petitioner* developed by the United States Environmental Protection Agency (USEPA) dated August 2009 (USEPA 2009);
- *Guidance Manual for Petitions to Delist Hazardous Waste, Second Edition*, published by the USEPA dated March 1993 (USEPA 1993); and
- *Delisting Risk Assessment Software* program developed by the USEPA (USEPA 2010).

This delisting petition has been formatted to follow the outline found in Appendix A of the USEPA Guidance Manual (USEPA 1993, pg. 84). To aid in the interpretation of the petition, text taken directly from the Guidance Manual outline is colored blue, and text populated by the petitioner is colored black.

Current Operations

Prior to preparation of the Sampling and Analysis Plan (SAP) for the delisting process, a comprehensive list of constituents of potential concern (COPCs) for consideration was developed. This list was developed using USEPA regulations and guidance, including the Hazardous Waste Delisting Risk Assessment Software (DRAS). The list of COPCs for consideration was then evaluated using generator

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[1] Oregon DEQ has adopted by reference the EPA criteria for evaluating delisting petitions. See Oregon Administrative Rules (OAR) 340-100-0020(2) and OAR 340-100-0022 (1), (2).

knowledge of plant process operations. Many of the constituents were removed from the final list of COPCs because they were absent from raw materials used in operations at the facility and were therefore not reasonably expected to be present in the waste. Additional constituents were removed because they were unrelated to the F006 hazardous waste listing (USEPA 2009. pg. 15). A complete description of the process used to identify a final list of COPCs can be found in the SAP (SLR 2019).

ATI uses the Chem Mill process to clean, etch, and remove the undesirable “alpha case” thin film that forms on the surface of the titanium-alloy cast parts during production. The Chem Mill process can be conducted before and/or after the finishing steps including welding, penetrant dye inspection, X-ray inspection, visual inspection, and heat treatment. The Chem Mill process uses either stainless steel or plastic casings with some Hastelloy components to immerse (i.e., dip) the alloy parts into an acid bath consisting of nitric acid, hydrofluoric acid, a surfactant, and water. The acid bath is utilized until it is spent, at which point it is transferred to the onsite neutralization system prior to discharge to the onsite WWTS. After the acid bath dip, the parts are submerged in a series of rinse baths and wash-downs to remove drag-out acid solution that carries over to the rinse baths as films on the parts. Titanium and small amounts of metals found in the titanium alloys are the only materials that are subjected to the Chem Mill process; none of the constituents for which the F006 hazardous waste designation was originally developed (cadmium, nickel, hexavalent chromium, or complexed cyanide) are found in the titanium alloys or acid baths used in the Chem Mill process.

ATI has an Industrial Wastewater Discharge Permit (No. 3369-02) to discharge to the City of Albany Publicly-Owned Treatment Works (POTW) following a number of pretreatment steps. ATI utilizes an onsite WWTS to neutralize and remove contaminants from the process wastewater streams (including wastewater generated from the spent Chem Mill acid and rinse baths) prior to discharge. The WWTS generates sludge in the form of filter press cake as it removes suspended and dissolved solids from the wastewater. The Chem Mill wastewater sludge is expected to be generated at a maximum rate of approximately 175 cubic yards (yd^3) per week or 9,000 yd^3 per year. This waste will continue to be generated on an ongoing basis.

Sampling and Analysis Plan

In January 2019, SLR submitted a SAP to DEQ on behalf of ATI proposing sampling methods and analytical testing to characterize the sludge from the Chem Mill process (SLR 2019). The SAP was based on the guidance documents previously noted and was approved by DEQ on February 4, 2019.

Sampling Collection and Analysis

SLR staff collected five composite Chem Mill wastewater sludge samples using SW-846 field methods during four events which represented unique periods of sludge generation. The sampling was conducted on February 14, 2019; February 20, 2019; March 1, 2019; and March 7, 2019. Due to the uniformity of the process and consistency of the liquids undergoing treatment, temporal variability of the sludge across multiple batches was not expected to be substantial.

Although horizontal spatial variability was not expected to be substantial, a random unbiased sampling strategy was used to characterize the Chem Mill wastewater sludge. Composite samples consisted of five aliquots taken from a randomly selected area within a two-dimensional grid. The grid consisted of 120, 1-foot-square parcels conceptually laid over the Chem Mill wastewater sludge roll-off bin. Each aliquot consisted of a full column of waste from the top of the waste surface to the bottom of the bin to capture any vertical spatial variability. Two unique composite samples were collected during the first event from the same waste bin using a different set of aliquots to verify that spatial variability within a single waste bin was not substantial.

Samples were collected using a hand bucket auger which allowed for a full column of waste to be collected. Samples were submitted for laboratory analytical testing of cadmium, chromium, cyanide, fluoride, hexavalent chromium, manganese, molybdenum, nickel, silver, vanadium, and zirconium. The total COPC concentrations were compared to relevant DRAS maximum allowable total concentrations. Where appropriate, follow-up testing using the toxicity characteristic leachate procedure (TCLP) was performed. TCLP concentrations were compared to relevant DRAS maximum allowable TCLP concentrations and RCRA toxicity characteristic regulatory levels.

Analytical Results

Laboratory analytical testing was performed by Pace Lab Sciences (Pace) and Specialty Analytical (Specialty). The total COPC concentrations in the sludge samples were compared to relevant DRAS maximum allowable total concentrations (collectively referred to as benchmark levels). Where concentrations exceeded 20 times the DRAS concentration, follow-up testing using TCLP was performed. TCLP concentrations were compared to relevant DRAS maximum allowable TCLP concentrations and RCRA toxicity characteristic regulatory levels.

Analytical results documented that total and TCLP concentrations detected above the reportable detection limits (RDLs) were below benchmark levels. Total and TCLP concentrations for COPCs were relatively consistent in the same bin and across multiple sampling events (see Table 3). These results indicate that the waste is eligible for delisting.

Conclusions

The analytical data from the Chem Mill wastewater sludge sampling events supports the determination that this waste is not hazardous and should not be classified as F006 hazardous waste.

This result is not unexpected. The wastewater treatment processes for which the F006 hazardous waste listing was developed treats wastewaters from electroplating operations that contain metals such as cadmium, hexavalent chromium, nickel, and complexed cyanide. These chemicals are not found in the titanium alloys ATI processes or the acid baths used in the Chem Mill. Titanium and additional metals found in the alloys are the metals subjected to the processes at ATI.

PART 1: DELISTING ADMINISTRATIVE INFORMATION

1. **Name of Petitioner.**
   a. **Name of individual or firm submitting petition:**

   Pacific Cast Technologies, Inc. dba ATI Cast Products

   b. **Mailing address of individual or firm:**

   150 Queen Avenue SW
   Albany, Oregon 97322

2. **People to contact for additional information pertaining to this petition:**

   a. **Name, title, telephone no.:**

   Tammy Casper; Sr. Lead, EH&S; (541) 223-3831

   b. **Mailing address of contact(s) if different from petitioner:**

   Same as Petitioner address.

3. **Facility responsible for generating petitioned waste:**

Pacific Cast Technologies, Inc. dba ATI Cast Products
150 Queen Avenue SW
Albany, Oregon 97322

RCRA ID number: ORD044106110

4. **Location of petitioned waste:**

Same as facility name and address provided above in item 3.

5. **Describe the proposed delisting action:**

ATI produces titanium-alloy components for the aerospace industry by investment casting. [redacted] A number of processes are used to produce the parts including the Chem Mill process which generates spent liquids (wastewater) and associated sludge. In 2017, DEQ notified ATI that it considers sludge produced from treating the wastewater from the facility's Chem Mill process to be F006 listed hazardous waste, regulated by RCRA.

ATI proposes to delist wastewater sludges used in the Chem Mill process so that they are no longer considered F006 hazardous waste. The Chem Mill acid baths and titanium alloys used in the process do not contain the raw materials for which F006 was developed (cadmium, hexavalent chromium, nickel, or complexed cyanides). In addition, the sludges do not exhibit any characteristics of a hazardous waste.

6. Provide a statement of the need and justification for the proposed action:

Laboratory analytical results have shown that the wastewater sludges from the Chem Mill process do not contain constituents of potential concern at hazardous concentrations and do not pose an unacceptable risk to human health or the environment. Managing the material as hazardous waste is an economic hardship. ATI currently ships the waste over 200 miles to the [redacted]

7. Signed Certification Statement:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for getting the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for sending false information, including the possibility of fine and imprisonment.

Signed by Authorized Representative*

Signature: Tammy M. Casper
Typed Name: Tammy M. Casper
Title: Sr. Lead, EH&S

***Note: An "authorized representative" is a person responsible for the overall operation of a facility or an operational unit (i.e., part of a facility), for example, a plant manager, superintendent, or person of equivalent responsibility.**

PART 2: DELISTING WASTE AND WASTE MANAGEMENT INFORMATION

BASIS FOR THE WASTE LISTING

1. **Which of the following scenarios best describes the petitioned waste? (Choose the most appropriate scenario and provide the information requested for the chosen scenario.)**

   a. **Petitioned waste is not a mixture of two or more listed hazardous wastes.**

      Common name of petitioned waste:

      Chem Mill wastewater sludge

      EPA Hazardous Waste Number:

      F006

      Hazardous waste description:

      Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc, and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.

   b. **Petitioned waste is a mixture of two or more listed hazardous wastes:**

      Not applicable.

   c. **Petitioned waste is a mixture of one or more solid non-hazardous wastes and one or more listed hazardous wastes, as described in 40 CFR 261.3(a)(2)(iii-iv):**

      Not applicable.

   d. **Petitioned waste is generated from the treatment, storage, or disposal of one or more listed hazardous wastes (or solid non-hazardous and listed hazardous waste mixture), as described in 40 CFR 261.3(c)(2)(i):**

      Not applicable.

2. **Describe the physical form of the petitioned waste (e.g., solid, liquid):**

   The Chem Mill wastewater sludge sampled for this petition was the wastewater treatment system filter press cake. The filter press cake is a solid; it is dewatered sludge that has the consistency of clay.

3. **If the physical form is sludge or liquid, estimate based on waste analysis the percentage of solids (e.g., provide a range):**

   Analytical results indicate that the percent solids in the sludge range from 41.2% to 52.2%.

HISTORY OF WASTE GENERATION

4. **Which of the following describes the generation of petitioned waste: (Indicate those that apply and provide the information requested for each item.):**

   a. **Waste has been generated in the past.**
      Provide the year when waste was first generated:

      Not applicable.

      Provide the year when waste generation ended (if applicable):

      Not applicable.

   b. **Waste is presently being generated.**
      Provide the year when waste was first generated:

      The Chem Mill wastewater sludge is presently being generated. The filter press cake has been generated since at least 1993.

   c. **Waste will be generated in the future:**

      The Chem Mill wastewater sludge will be generated for the foreseeable future.

VOLUME OF PETITIONED WASTE

5. **Is the petition for a waste of fixed quantity (e.g. a discrete volume of waste contained in a unit)?**

   No **[If yes, answer item 5a. If no, answer item 5b]**

a. Petitioned waste is/will be a fixed quantity. Estimate volume:

Not applicable.

Describe the method of volume estimate:

Not applicable.

b. Petitioned waste is/will be generated on a routine basis.

The Chem Mill wastewater sludge will be generated on a routine basis. The approximate generation rate is shown below:

	Average Quantity	Maximum Quantity	Unit of Measurement
Monthly Volume	150	750	Cubic yards
Annual Volume	1,800	9,000	Cubic yards

Describe the method of volume estimation:

The average annual volume was estimated by assuming the waste will be generated at a maximum rate of one 18-yd^3 roll-off bin every three to four days (i.e., approximately 90 roll-off bins per year). The average annual volume was multiplied by a contingency factor of five and rounded up to the nearest thousand to account for increased process throughput. The Chem Mill process is not anticipated to change; however, ATI may expand production in the next decade.

The average and maximum monthly volumes were estimated by dividing the average and maximum annual quantities by 12, respectively. The maximum volumes were used as the input for DRAS when evaluating the analytical data compared to maximum allowable concentrations.

HISTORY OF WASTE MANAGEMENT

6. As appropriate, describe the present, past, and proposed waste management methods for the petitioned waste.

a. Present waste management methods and off-site facility or facilities used (name, address, and waste management method):

[redacted]

[redacted] The 18-yd^3 roll-off bins are stored in the 90-day accumulation area on pavement and shipped offsite approximately every two to seven days. The waste is currently shipped to the Chemical Waste Management facility located at 17629 Cedar Springs Lane in Arlington, Oregon for disposal in a RCRA permitted hazardous waste landfill.

b. Past waste management methods, if different from present, and off-site facility or facilities used (name, address, and waste management method):

Prior to DEQ's re-evaluation of Oregon's titanium casting facility processes, DEQ did not consider the sludge generated from the ATI Chem Mill process to be an F006 listed hazardous waste. As such, ATI shipped the Chem Mill wastewater sludge to the Coffin Butte landfill located at 28972 Coffin Butte Road in Corvallis, Oregon by Republic Services for disposal as non-hazardous waste.

c. Proposed waste management methods if delisting petition is granted and off-site facility or facilities to be used (name, address, and waste management method):

If delisting is approved, ATI will ship the Chem Mill wastewater sludge to either the Coffin Butte landfill located at 28972 Coffin Butte Road in Corvallis, Oregon or an equivalent Subtitle D landfill.

PART 3: GENERAL OPERATIONS AT THE GENERATING FACILITY

1. **Describe facility business area(s) and operations. Include SIC code(s).**

   SIC Code(s):

   3369

   NAICS Code(s):

   331529

2. **List and describe products manufactured at the facility:**

   ATI produces titanium-alloy cast parts for the aerospace industry.

3. **List and describe all wastes (including all hazardous wastes) generated at the facility:**

   ATI generates the hazardous wastes listed below. The corresponding waste code is included after the waste name in parenthesis.

   [redacted]

   ATI also generates a number of non-hazardous wastes including:

   [redacted]

4. **Describe your manufacturing and waste treatment areas and waste management units. Attach schematics showing the layout of the facility:**

   The investment casting process is performed in multiple manufacturing areas at the site. Satellite accumulation areas are located within the manufacturing areas. Waste is also accumulated at a 90-day accumulation area prior to shipment offsite.

The attached Figure 1 illustrates the location of the facility. Figure 2 illustrates a layout of the facility including the locations of the filter press and Chem Mill wastewater sludge hazardous waste accumulation area. ATI does not operate treatment, storage, and disposal (TSD) units.

5. **Describe the regulatory status of all on-site waste treatment, storage, and disposal units. Include a list of all hazardous waste permits and other permits issued under Federal and State environmental statutes. Include the permit numbers in this list:**

ATI does not operate treatment, storage, and disposal units. Table 1 provides a list of State and Federal Permits.

CONTRIBUTING MANUFACTURING PROCESSES

6. **Describe and include schematics of all "pre-process" steps used to prepare materials for processing before primary manufacturing operations, including surface and equipment preparation operations. Identify all pre-process material inputs and outputs in your descriptions and schematics:**

The facility does not conduct pre-processing of materials prior to the primary manufacturing operations. However, an overview of the manufacturing processes that contribute to the wastewater are described below:

[redacted]

[redacted]

7. **Provide a step-by-step description and schematic of each manufacturing process contributing to the petitioned waste. Include each process step, reactions occurring, flow rates, and material inputs and outputs, as well as reaction intermediates and byproducts. Identify and describe waste inputs and outputs on the schematic(s) and show how each waste is managed:**

[redacted]

[redacted]

[redacted]

8. Describe, and identify on the schematic, exactly where the petitioned waste is generated (if generated by a manufacturing process):

The petitioned Chem Mill wastewater sludge waste is not generated in the manufacturing process. It is generated as filter press cake in the WWTS area (shown in Figure 2) as a result of treating the Chem Mill wastewater (described above). A process flow diagram showing the WWTS is provided as Figure 3.

9. List and describe all process equipment, including the function of each unit and the ranges of the operating parameters:

[redacted]

10. Describe all of your operating cycles (batch cycles, versus continuous operation, start- up, shutdown, maintenance, cleaning) on a daily, weekly, or other period basis, as appropriate. Identify periods when process wastes are not generated (e.g., plant shutdowns or routine equipment maintenance):

[redacted]

11. Assess the extent that all contributing manufacturing processes, operations, process materials, or generated wastes have varied in the past or may vary in the future:

Aspects of the manufacturing historically performed at ATI that are different than current operations are not relevant for this type of waste because it is generated and shipped offsite continuously.

[redacted]

12. Describe how the composition and generation rate of the petitioned waste may periodically vary due to any aspect of manufacturing process variability:

[redacted]

[redacted]

13. Does a waste treatment process contribute to the petitioned waste?

Yes **[Answer item 14]**

CONTRIBUTING WASTE TREATMENT PROCESSES

14. Provide a step-by-step description and schematic of each waste treatment process contributing to the petitioned waste. Include process steps, reactions occurring, flow rates, material inputs, and waste inputs and outputs:

[redacted]

[redacted]

[redacted]

Chem Mill Wastewater Sludge Handling and Disposal

De-watered Chem Mill wastewater sludge (filter press cake) is generated in batches when the sludge in the sludge holding tank is processed through the filter press. Once the sludge has been processed, the dry solids are mechanically removed into an 18-yd^3 roll-off waste container. This task is performed approximately once per day. The sludge is stored in the roll-off waste container until it is shipped offsite as F006 hazardous waste. Sludge is currently generated at a rate of approximately 35 yd^3 per week, or 1,800 yd^3 per year.

A process flow diagram showing the WWTS is shown in Figure 3.

15. Describe, and identify on the schematic, exactly where the petitioned waste is generated (if applicable):

[redacted] The Chem Mill wastewater sludge, generated as filter press cake, is generated from the filter press when it is mechanically scraped-off into an 18-yd^3 roll-off waste container placed beneath the sludge press. The filtrate from the press is combined with the supernatant from the clarifier and conveyed to the effluent staging tank. When the roll-off containers are full, they are covered with a tarp and placed in the hazardous waste accumulation area until they are shipped to the Chemical Waste Management facility located in Arlington, OR.

16. Identify and describe waste inputs and outputs on the schematic(s) and show how each waste is managed:

[redacted] The filter cake is scraped directly into an 18-yd^3 roll-off container and then placed in the hazardous waste accumulation area and covered with a tarp for storage prior to shipment to the Chemical Waste Management facility located in Arlington, Oregon.

17. Describe all non-process wastes entering the waste treatment processes, including composition, rate of inputs, and source:

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

18. **List and describe all process equipment, including the function of each unit and the ranges of the operating parameters:**

[redacted]

19. **Describe all of your operating cycles (batch cycles versus continuous operation, start-up, shutdown, maintenance, cleaning) on a daily, weekly, or other period basis, as appropriate. Identify periods when treatment wastes are not generated (e.g., plant shutdowns or routine equipment maintenance):**

[redacted]

20. **Assess the extent that all contributing treatment processes, operations, process materials, or generated wastes have varied in the past or may vary in the future:**

The Chem Mill has not changed significantly and is not anticipated to change with regard to the chemicals or materials used in the processes. However, the volume of wastewater generated in the Chem Mill may increase with facility growth. Additional info can be found above in **Part 3, Sections 14 and 17**.

21. **Describe how the composition and generation rate of the petitioned waste may periodically vary due to any aspect of treatment process variability:**

The variability of the sludge across multiple batches is considered to be minor due to the uniformity of the WWTS and the consistency of the liquids being treated. [redacted]

Data collected during the sampling for this delisting petition shows that very little temporal variability in the Chem Mill wastewater sludge exists. The analytical results for the sampled sludge (filter press cake) are included as Table 3.

22. Has the petitioned waste been managed in a land-based unit?

No.

WASTE MANAGEMENT OPERATIONS

23. Provide the following information (items 23a through 23g) for each unit that is (or was) used to manage the petitioned waste:
(If the petitioned waste is managed in more than one unit, assign a number to each unit (e.g., Unit #1, Unit #2, etc.) and use the unit numbers to associate a description with a specific unit.)

a. Unit location/address (show if on- or off-site):

Not applicable. Landfill is not owned or operated by ATI.

b. Description of unit construction (current design and materials):

Not applicable. Landfill is not owned or operated by ATI.

c. History of unit design (e.g., chronological summary of any changes to original construction):

Not applicable. Landfill is not owned or operated by ATI.

d. Purpose and description of any unit design and operating changes:

Not applicable. Landfill is not owned or operated by ATI.

e. Estimated surface area:

Not applicable. Landfill is not owned or operated by ATI.

f. Estimated unit capacity volume:

Not applicable. Landfill is not owned or operated by ATI.

g. Listing of waste and material inputs which have occurred throughout the life of the unit, if known:

Not applicable. Landfill is not owned or operated by ATI.

24. Provide detailed schematic(s) of the waste unit(s) showing (as appropriate) unit dimensions, influent point(s), effluent point(s), and waste thickness:

Not applicable. Landfill is not owned or operated by ATI.

PROCESS MATERIALS

25. **List all materials used in the operations that contribute to the petitioned waste. The list should include:**

    a. **The name of the material(s):**

    [redacted]

    [redacted]

    [redacted]

    [redacted]

    b. **The process/operation in which it is used (i.e., manufacturing process, treatment process, waste management operations):**

    The Chem Mill is a manufacturing process, described in detail above. The WWTS is a system for pretreating industrial wastewater prior to discharge to the POTW.

    c. **Function of each material in the process:**

    [redacted]

    d. **Approximate annual quantities used:**

    [redacted]

    [redacted]

[redacted]

26. **Provide Material Safety Data Sheets (MSDS) and any other compositional information for trade name and non-elemental materials. Include raw materials, cleaners, oils, solvents, strippers and any by-products generated by the process:**

    Relevant Safety Data Sheets (SDSs) were provided to DEQ in a letter dated January 21, 2019 as part of the SAP.

27. **Specify the source, quality (i.e., recycled or virgin), and quantity of oil, grease, and hydraulic fluids entering the processes:**

    No known quantities of oil, grease, or hydraulic fluids enter the processes conducted at ATI related to the F006 hazardous waste.

SPECIAL INFORMATION

28. **Are you requesting an upfront exclusion for a waste that is not currently generated but will be in the future?**

    No.

29. **Explain how the bench-scale or pilot-scale process demonstration adequately models the proposed full-scale process:**

    Not applicable.

30. **Explain any real or potential differences between the two processes:**

    Not applicable.

31. **Describe the impact of those differences on the character of the petitioned waste:**

    Not applicable.

32. **Are you requesting an exclusion for a waste generated by a multiple waste treatment facility (MWTF)?**

    Not applicable.

33. **Describe your procedure for prescreening clients and wastes and how this procedure will be carried out should your waste be excluded:**

    Not applicable.

34. Describe the procedures by which you will make sure that: (1) treatment levels needed by an exclusion are maintained and (2) a hazardous waste is not disposed improperly as non-hazardous:

Not applicable.

PART 4: DELISTING ANALYTICAL PLAN DEVELOPMENT

1. **Provide a complete list of the constituents and parameters of concern identified for your petitioned waste based on appropriate waste constituent analyses and the results of an engineering analysis. Identify those constituents quantitated by laboratory analysis and those quantitated using mass balance demonstrations:**

The following resources were considered when developing a list of constituents and parameters of concern:

- "RCRA Hazardous Waste Delisting Program - Useful Information for the Petitioner" (USEPA 2009) and referenced materials including:
    - Appendix IX of 40 CFR part 264 – Groundwater Monitoring List
    - Appendix VIII of 40 CFR part 261 – Hazardous Constituents List
    - Chemicals explicitly listed in USEPA 1993 guidance including acetone, ethylbenzene, isophorone, 4-methyl-2-pentanone, styrene, and xylenes
- "Hazardous Waste Delisting Risk Assessment Software (DRAS)" and the associated "Users Guide for DRAS Version 3.0" (USEPA 2010).

ATI staff were interviewed to develop a comprehensive description of the manufacturing processes conducted at the site. The Petitioner worked alongside DEQ to create a list of relevant chemicals that would be quantified using laboratory analytical testing. The list was created following a comprehensive review of the information provided in interviews and facility SDSs. Constituents were not included in the list if historical interviews suggested the constituent was not used in processing at the site, the constituent was not found in facility SDSs, and/or the constituent was unrelated to the F006 hazardous waste listing (USEPA 2009, pg. 15).

A SAP was submitted to DEQ that contained a list indicating the constituents of concern to undergo analytical testing for the Chem Mill wastewater sludge. As described above, constituents that were not reasonably expected to be present in the wastes and/or were unrelated to the F006 hazardous waste listing were not included in the analytical plan. The SAP was approved by DEQ in an email dated February 4, 2019.

Concentrations of the constituents of concern were individually compared to the maximum allowable concentrations reported by the DRAS to determine if the waste was a candidate for delisting. According to the USEPA 2008 RCRA Delisting Technical Support Document, the waste may qualify to exit the hazardous waste management program if concentrations are below these values (USEPA 2008, pgs. 4-9). A DRAS analysis run was performed for the Chem Mill wastewater sludge using the highest reported concentrations of each COPC (see Appendix F). Total and TCLP results were also compared to the D-list of the RCRA characteristic hazardous waste concentrations according to Title 40 CFR, Section 302.4.

The DRAS required inputs characteristic of the Chem Mill wastewater sludge and receiving waste management unit(s) to generate maximum allowable concentrations. The inputs required included:

- Waste management type
- Waste volume
- Cancer risk level
- Hazard quotient
- Waste management unit active life
- Active life

Table 4.1, below, shows the inputs entered into DRAS for the Chem Mill wastewater sludge:

Table 4.1 DRAS Inputs for Waste Evaluation

Waste	Waste Management Type	Waste Volume (Cubic Yard)	Cancer Risk Level	Hazard Quotient	Waste Management Unit Type	Active Life (Years)
Chem Mill Wastewater Sludge	Landfill	9,000	1E-6	1.0	Multiple Year Batch	20

Prior to laboratory analytical testing, SLR compared method reporting limits (MRLs) for each constituent test method to the maximum allowable total and TCLP concentrations reported by DRAS and the D-list for RCRA characteristic hazardous waste to verify that appropriate test methods were assigned to each constituent.

Samples collected were first analyzed for total concentrations of the constituents of concern. Contingency sample containers were also submitted for follow-up TCLP laboratory analytical testing, depending on the results of the total concentrations. A constituent with a total concentration greater than 20 times the DRAS maximum allowable TCLP concentration or the D-List Hazardous Characteristic concentration underwent subsequent TCLP laboratory quantitative analysis. TCLP testing was not performed if the total concentration of a constituent was less than 20 times the concentration of the benchmarks because the test method requires the sample be diluted by 20 times to simulate landfill leachate conditions (USEPA 1992, Section 2.2).

The SAP lists the chemicals considered when developing a list of constituents and parameters of concern. Table 2 lists the constituents of potential concern identified to be quantified using laboratory analytical testing following an engineering analysis of processes contributing to the generation of Chem Mill wastewater sludge. Table 3 includes analytical data along with DRAS maximum allowable total concentrations, DRAS maximum allowable TCLP concentrations, and RCRA D-List characteristic hazardous waste concentrations. An electronic copy of the DRAS analysis for the Chem Mill wastewater sludge is included in Appendix F.

2. **Provide mass balance demonstrations for those constituents of concern in your list for which analyses were not conducted. Provide all calculations and assumptions:**

Mass balances were not used for determining a list of constituents of concern.

3. **Explain why any other delisting constituent of concern is not on the constituent of concern list for your petitioned waste:**

USEPA regulations and guidance, including the DRAS, were used to develop an initial comprehensive list of COPCs. The initial list of COPCs was then evaluated using historical data and generator knowledge of plant process operations. Many of these constituents were removed from the list of constituents to undergo laboratory analytical testing because they were absent from raw materials used in operations at the facility and were therefore not reasonably expected to be present in the waste (USEPA 2009, pg. 15). The final list of constituents to undergo analytical testing was approved by DEQ in an email dated February 4, 2019.

Analyses of the processes related to the waste generation and analytical data indicated that the waste does not exhibit the characteristics of ignitable (D001), corrosive (D002), reactive (D003), or toxic hazardous waste (D004 through D043).

4. **Explain why your petitioned waste does not exhibit any hazardous waste characteristic for which analysis was not conducted:**

The constituents excluded from analytical laboratory analysis are not reasonably expected to be present in the wastes at hazardous levels following a thorough engineering and SDS review.

PART 5: DELISTING SAMPLE AND ANALYSIS INFORMATION

1. **Has a draft sampling and analysis plan been submitted to EPA/DEQ for review before petition preparation?**

Yes **[Answer items 1a and 1b]**

   a. **Submittal date of sampling and analysis plan:**

   January 25, 2019.

   b. **Log number assigned by EPA to your draft submittal:**

   Not applicable, submitted to the Oregon DEQ. The SAP was approved by DEQ in an email dated February 4, 2019.

WASTE SAMPLING INFORMATION

2. **Were all sampling-related activities performed by in-house staff?**

No **[Answer items 2a and 2b]**

   a. **Name and address of the organization(s) or company(s) responsible for designing the sampling strategy and collecting the samples:**

   SLR International Corporation
   1800 Blankenship Road, Suite 440
   West Linn, Oregon 97068

   b. **For each individual person (in-house and otherwise) who designed the sampling plan, the quality control plan, and/or participated in sample collection, please provide a resume of qualifications and the following information:**

   Name: Sarah Kronholm, P.E. (SLR International Corporation)
   Title: Principal Engineer (prepared SAP, managed project)

   Name: Tyler Weber, P.E. (SLR International Corporation)
   Title: Project Engineer (prepared SAP, participated in sample collection)

   Name: Rafaella Vrachimi, E.I. (SLR International Corporation)
   Title: Staff Engineer (provided administrative support during sample collection)

SAMPLING STRATEGY

3. Provide the following information (items 3a through 3f) on the sampling strategy you followed to make sure that the samples were representative:

a. Identify which process point discharges, containment areas (e.g., lagoons), or other areas (e.g., soil) were sampled and why these areas were selected for sample collection:

SLR collected samples of the Chem Mill wastewater treatment sludge from the filter press cake roll-off containers over a 4-week period. The waste in these containers was representative of the Chem Mill wastewater sludge disposed in a landfill.

b. Describe the techniques and guidelines used to select waste sampling points (e.g., random sampling procedure or fixed transect and offset sampling procedure):

In accordance with the RCRA Waste Sampling Draft Technical Guidance (USEPA 2002, pg. 57), random unbiased composite sampling techniques were used to sample waste representing the Chem Mill wastewater sludge.

c. Describe the sampling and subsampling (i.e., transferring of sample aliquots into containers specific to certain analyses) procedures used during the sample collection process, including the particular days and times selected for sample collection, the number of grab samples collected for each composite sample, and why these procedures were used:

A random unbiased sampling strategy was used to sample the Chem Mill wastewater sludge. Random unbiased sampling is best suited for sampling a waste that is not reasonably expected to have spatial variability. SLR collected five composite samples from the 18-yd^3 Chem Mill wastewater sludge waste roll-offs. Two samples were collected during the first event and a single sample was collected during each of the three subsequent events. Sampling occurred weekly over a period of four consecutive weeks. Each event was separated by a duration of approximately one week. Samples were taken over these four consecutive periods of generation to capture temporal waste variability, in accordance with the 2009 USEPA delisting guidance (USEPA, 2009, pg. 16). The samples were collected during mid-morning on February 14, 2019; February 20, 2019; March 1, 2019; and March 7, 2019. Sampling was performed while the roll-off was located in the waste accumulation storage area prior to offsite shipment.

Each composite sample consisted of 5 aliquots from the same waste bin. Locations of the aliquots within the bin were randomly selected from the grid formation, consisting of approximately 1-ft “squares” overlain on the waste top surface. The dimension of the roll-offs was 15 ft by 8 ft by 4 ft. Each “square” in the grid was assigned a number, and a random number generator was used to determine which “square” the aliquot samples were taken from (USEPA 2002, pg. 57). A tape measure was used to identify the location of each aliquot. A telescopic boom lift was maneuvered over the open top of the roll-off to provide a safe platform for standing while the samples were collected. This procedure was performed to represent the contents of the entire roll-off. Figures 4 through 7 illustrate the aliquot locations for each composite sample. SLR used the random number table provided by the 1993 USEPA delisting guidance document (USEPA, 1993, pg. 147).

Samples were collected from the platform of the portable lift using a decontaminated stainless-steel hand-auger. Decontaminated stainless steel extension rods were used to advance the auger bucket from the waste surface, down to the bottom of the bin. Equipment was not decontaminated between aliquot locations because these were combined to create a composite sample. Complete columns of Chem Mill wastewater sludge were collected for each aliquot sample to capture vertical spatial variability in the waste. Depending on the height of the waste at a specific aliquot location, this consisted of 1-4 core depths. Aliquots were collected and placed in a decontaminated high-density polyethylene (HDPE) 5-gallon bucket and mixed together using a decontaminated stainless steel spoon until the mixture was homogenous.

The hand bucket auger used to collect the samples had an outside diameter of 2 inches. The auger bucket was 8.25 inches (9.5 inches including teeth) in length. The volume of the auger bucket was approximately 15 oz. For each event, SLR filled five, 8-oz jars for laboratory analysis. Two of the 8-oz jars were collected for each sample to act as contingency containers to ensure adequate volume was provided to labs for testing. None of the containers for the Chem Mill wastewater sludge sampling contained preservatives.

After the composite sample had been mixed, it was placed in clean laboratory-supplied sample containers. All containers were properly labeled with the sample identification, date and time of collection, and analysis required. The samples were securely wrapped to prevent breakage. Samples were then immediately placed on ice in coolers. Detailed documentation of the sampling event was recorded and a chain of custody (COC) was completed. COCs included sample IDs, date and time of collection, sampler initials, and parameters for analyses. The sampler signed the COC to relinquish custody with the date and time of transfer. The COC was placed in a heavy-duty locking plastic bag and placed in the cooler. A custody seal was placed on each cooler to ensure the samples were not tampered with. The coolers were sealed with packing tape and the FedEx label was adhered to the tops of the coolers. Some samples were hand delivered to Specialty in Clackamas, Oregon. The remaining samples were delivered to the FedEx facility in West Linn, Oregon and then shipped to Pace in Mt Juliet, Tennessee for next day delivery.

d. **Describe the sampling devices used for sample collection and the basis for selecting the devices:**

Sample aliquots were collected with a 2-inch stainless steel hand bucket auger. This equipment was determined to be best suited for roll-off bin sampling based on guidance from the RCRA Waste Sampling Draft Technical Guidance (USEPA 2002. pgs. 99, 112, and 225). The hand bucket auger effectively collected the moist clayey sample and held the sample until it was removed from the roll-off and transferred to the HDPE bucket for mixing.

e. **Identify and discuss any deviations from your original sampling plan and strategy and the impact of these deviations on waste characterization:**

There were no deviations from the SAP with regard to the specified constituents subjected to testing, the laboratory analytical testing for quantitative analysis, or the sample collection methodologies.

f. **Explain why you believe the samples collected are non-biased and sufficiently represent the petitioned waste. In this explanation, fully address the potential for waste uniformity or spatial and temporal variability and how the strategy ensured collection of representative samples:**

Chem Mill wastewater sludge is generated on a continuous basis seven days per week. There are no operational changes that occur in the treatment process. The sludge is stored in a sludge tank and fed to a filter press where the sludge is dewatered. The resultant filter cake is collected in an 18-yd^3 roll-off. One 18-yd^3 roll-off bin is filled approximately every three to four days. The manner in which the filter cake is generated indicates that the filter cake is generally homogeneous and has limited spatial and temporal variability. The consistency of the constituent concentrations within the same bin and across the sample periods supports this claim.

SAMPLE SPECIFIC INFORMATION

4. **How many samples of the petitioned waste were collected? Is the number of samples taken different from the number of samples agreed upon during the pre-petition scoping meeting? Explain the deviation:**

Five composite samples of the Chem Mill wastewater sludge were collected. Each consisted of five aliquots from the same waste bin, with the locations of aliquots within the bin being selected randomly from the grid formation. Overall, a sample was collected approximately once every week from a unique waste bin, except for the first two samples (1A and 1B), which were both collected from the same bin during the Period 1 sampling event. COPCs were select metals, cyanide, and fluoride.

The number of samples taken did not deviate from the SAP developed with collaboration from DEQ.

5. **For each individual sample collected, please provide the following sample-specific information (items 5a through 5g):**

   a. **For each sample included in item 4, provide the sample identification number (as it appears in your field logbook and other records), the date that the sample was taken, an indication as to what type of sample it is (waste sample versus quality control sample and whether or not it is a composite sample):**

   Chem Mill wastewater sludge sampling events were conducted on February 14, 2019; February 20, 2019; March 1, 2019; and March 7, 2019. Table 3 indicates details for each sample including the identification, collection date, and type (grab or composite).

   b. **Describe how each sample was collected, and its point of collection from the petitioned waste. If a sample is a composite of grabs, provide the number of grab samples collected for the composite sample, the sampling location for each grab sample, the volume of each grab sample, and the volume of the composite sample:**

   This is described above in **Part 5, Section 3.c.**

   c. **Describe the general sampling location (e.g., which quadrant of a surface impoundment) and the specific sampling points (e.g., specific location in the quadrant). You may refer to numbered sampling points shown in a diagram:**

   This is described above in **Part 5, Section 3.c.** Figures 4 through 7 include additional information on the aliquot locations for each composite sample.

   d. **Describe how each sample was composited (e.g., equipment used and manner of mixing):**

   For each sample, five aliquots were placed in a clean 5-gallon HDPE bucket, and then mixed together with a stainless steel spoon continuously until a homogeneous composite sample was formed.

   e. **Provide a physical description of each sample at time of collection (e.g., color, odor, whether phase separation occurred soon after collection):**

   The sample was uniform in color and texture throughout each individual sampling event and across the four events. The sample was beige in color and resembled a clayey soil. The sample did not have a distinct odor.

f. For each composite sample, specify the time and date when the grab samples were collected and the time and date when the sample was composited, as applicable:

The time and date at which containers were filled with the composite sample were recorded and are included in laboratory analytical reports (see Appendices B through E). The time at which aliquot sampling began was recorded but the specific time that each aliquot sample was collected was not.

g. Describe the handling and preparation techniques used for each sample (including types of containers used and techniques employed for container preparation) and types and amounts of preservatives used:

After collection, samples were placed immediately into clean, laboratory-supplied jars; sealed; labeled; and placed on ice for delivery to the analytical laboratory under strict COC procedures. Clean, nitrile sampling gloves were worn during sample handling procedures. The mixing bucket, spoon, and bucket auger were decontaminated prior to each sample event using a solution of Alconox detergent and distilled water, followed by a triple rinse with distilled water.

Each sample was placed in five, 8-oz glass jars without any preservatives. One jar was used for total analysis of fluoride, hexavalent chromium, and cyanide. Another jar was used for total analysis of zirconium. Follow-up TCLP analysis was performed using a third jar. The two additional jars were held as contingency containers in case additional analysis was required.

OTHER GENERAL INFORMATION

6. Describe the weather conditions during sampling (if conducted outdoors):

Sampling activities occurred between 9:00 AM and 12:00 PM. The weather during the sampling events was sunny, cloudy, or rainy. Temperatures were approximately between 35˚F and 50˚F.

7. Describe any facility activities separate from sampling that occurred at the same time and might have affected sample representativeness:

Activities at the facility were typical of normal operation from the start of sampling periods to the conclusion of sampling.

8. Describe sampling device decontamination; and note when disposable devices were used for sample collection:

Three pieces of equipment were used for the sampling activities including a stainless steel hand auger with 5-ft extension rods, a stainless steel spoon, and a 5-gallon HDPE bucket. Prior to sampling, each piece of equipment was decontaminated using Alconox and a triple wash of distilled water.

9. Were the chain-of-custody procedures specified in SW-846 followed?

Yes. Additionally, there were no field modifications to the SAP. **[Skip to item 11]**

10. Provide a description of the quality control procedures and documentation system used to track sample location and maintain sample integrity during transportation to the laboratory. Copies of the chain-of-custody forms may be provided, but are not needed:

Not applicable.

LOCALIZED AREA OF CONTAMINATION

11. Have you collected samples to characterize a localized area of contamination (a "hot spot") within the petitioned waste?

No **[Skip to item 16]**

12. Discuss your basis for believing a hot spot may or does exist (e.g., records of a one-time discharge of a concentrated material at a specific location):

Not applicable.

13. Describe the known or predicted location (on a diagram) and the dimensions (e.g., depth, width and length) of the hot spot:

Not applicable.

14. Identify the samples specifically collected to characterize the hot spot:

Not applicable.

15. Explain why the samples sufficiently represent the hot spot:

Not applicable.

MULTIPLE WASTE TREATMENT FACILITY

16. Have you collected samples to characterize a waste generated by a multiple waste treatment facility (MWTF)?

No **[Skip to item 21]**

17. **List and describe the untreated wastes that were treated and are represented by the treatment residue samples collected during the sampling period:**

    Not applicable.

18. **Provide the percentage of total wastes treated annually that was represented by the sampling period:**

    Not applicable.

19. **List and briefly describe the untreated wastes that also are treated at the facility but were not represented by the sampling period:**

    Not applicable.

20. **Explain why the wastes not represented by the sampling period are not expected to contain any other hazardous constituents of concern, different levels of constituents of concern, or other different characteristics than that represented by the sampling period:**

    Not applicable.

WASTE ANALYSIS INFORMATION

21. **Were sample analyses done by in-house staff?**

    No **[Answer items 21a and 21b]**

    a. **Name and address of the organization(s) or company(s) responsible for sample analyses:**

       Pace National / ESC Lab Sciences (Pace)
       12065 Lebanon Road
       Mount Juliet, Tennessee
       615-773-9772

       Specialty Analytical (Specialty)
       9011 SE Jansen Road
       Clackamas, Oregon, 97015
       503-607-1331

b. **For each individual person (in-house and otherwise) who conducted analyses or was responsible for data reduction, validation, and laboratory quality control, please provide a resume of qualifications and the following information:**

   Resumes of qualifications for individuals who conducted analyses or other related laboratory activities are included in Appendix A.

22. **Provide your signed laboratory data reporting forms from all analyses, including results from quality control analyses:**

    Laboratory reporting forms are included in Appendices B through E.

23. **Provide the following information on each sample and each analysis:**

    a. **Sample identification numbers as logged during collection and as assigned by the laboratory:**
    b. **Type of sample (e.g., waste sample, waste sample replicate, equipment blank, field blank):**
    c. **Date of sample receipt by the laboratory:**
    d. **The sample workup or preparation method and reference for the method (e.g., SW-846 Method 3500):**
    e. **The date of sample workup or preparation:**
    f. **The name of the person conducting the analysis:**
    g. **The date of extraction and analysis:**
    h. **The test method used and the source of the test method (e.g., SW-846 Method 8020):**
    i. **The specific constituent, parameter, or hazard for which analysis was conducted:**
    j. **The test results, expressed in appropriate units (e.g., mg/L, mg/kg):**
    k. **The basis for the analysis (e.g., wet/dry weight):**
    l. **The quantitation limits:**

    The laboratory analytical reports contain the following information for each sample and analysis (see Appendices B through E).

24. **Provide the names and model numbers of all equipment used during analysis:**

    This information is found in the laboratory testing information (see Appendix A).

25. **Provide all other information necessary to fully interpret the test procedures or results:**

    All necessary information to fully interpret the test procedures and results is provided in the petition and lab reports.

26. For each quality control analysis that involved a matrix or a surrogate spike and spike duplicate analysis, provide the following information:

- **a. The name of the spike analyte added:**
- **b. The concentration of the spike analyte in the unspiked sample:**
- **c. The amount of the spike analyte added:**
- **d. The measured amount of the spike in both spiked samples:**
- **e. The calculated percent recovery of the spike and method of calculation:**
- **f. The acceptance criterion for recovery of each matrix spike:**
- **g. The relative percent difference (RPD) between the duplicate results:**
- **h. The acceptance criterion for the RPD:**

The above information is provided on the laboratory analytical reports (see Appendices B through E).

27. Identify whether the waste analytical data was corrected based on quality control results (e.g., blank analysis) and explain how the correction was made:

The waste analytical data was not corrected based on quality control results (see Appendices B through E).

28. Explain any inconsistencies or deviations found in the reported analytical results. The discussion should include any observed analytical interferences and what actions were taken to resolve the problems:

No inconsistencies or deviations were reported (see Appendices B through E).

29. If any calculations are necessary, (i.e., in use of the Oily Waste Extraction Procedure, for the Mobile Metal Concentration) please include all calculation sheets:

All concentrations were reported without the use of calculations.

PART 6: DELISTING GROUNDWATER MONITORING INFORMATION

1. **Show which of the following describes the management of the petitioned waste:**

   a. **The petitioned waste is currently managed in a land-based waste management unit (on-site or off- site), and groundwater monitoring is needed under 40 CFR Part 264 or 265 or authorized State equivalent, or other Federal, state, or local requirements; or if groundwater monitoring information is otherwise available for the unit:**

      The Chem Mill wastewater sludge is shipped to the Chemical Waste Management facility in Arlington, Oregon for disposal in a landfill permitted by the state of Oregon RCRA program. This landfill is subject to RCRA groundwater monitoring requirements under this permit. The analytical results from the sampling also indicate that the Chem Mill wastewater sludge is not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment or nearby groundwater.

   b. **The petitioned waste was once managed (but is no longer) in a land-based waste management unit (on-site or off-site) and groundwater monitoring was needed under 40 CFR Part 264 or 265 or authorized State equivalent, or other Federal, state, or local requirements; or if groundwater monitoring information is otherwise available for the unit:**

      Not applicable.

   c. **The petitioned waste is currently managed, or was once managed, in a land- based waste management unit, but groundwater monitoring requirement has been waived:**

      Not applicable.

   d. **The petitioned waste is currently managed, or was once managed, in one or more land-based waste management units containing also significant amounts of other wastes, and you consider groundwater data from these non-dedicated units are immaterial in evaluating the petitioned waste's impact on groundwater quality:**

      Based on the analytical results presented in this petition, the Chem Mill wastewater sludge is not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment or nearby groundwater.

   e. **None of the above management scenarios apply:**

      Not applicable.

2. **Has the appropriate responsible party previously submitted groundwater monitoring information for the subject units to an EPA Regional office or an authorized State in response to 40 CFR Part 264 or Part 265 requirements (or authorized State equivalent)?**

   Not applicable.

3. **Do you wish that the DEQ directly get the groundwater monitoring information from the EPA Region or State?**

   Not applicable.

4. **Indicate the EPA Regional or State Contact for getting the groundwater monitoring information (include name of contact, affiliation, mailing address, and phone number):**

   a. **Name of contact:** Seth Sadofsky, PhD, RG
   b. **Affiliation:** Materials Management, Western Region, Oregon DEQ
   c. **Title of report (if applicable):** NA
   d. **Street/P.O. Box:** 165 East 7th Avenue, Suite 100
   e. **City:** Eugene **State:** Oregon **Zip Code:** 97401
   f. **Phone:** (541) 687-7329

5. **Provide all available and relevant (e.g. for each unit used to manage the petitioned waste) groundwater monitoring information and reports which, at a minimum, should include:**

   a. **A description of site geology and hydrogeology:**
   b. **A description of the groundwater monitoring systems for the units in which the petitioned waste is (or was) managed:**
   c. **The results obtained from the analysis of groundwater samples:**
   d. **A discussion of sampling and analytical procedures followed in getting and analyzing the groundwater samples:**
   e. **Any additional information necessary to characterize the petitioned waste's impact on groundwater quality:**
   f. **An analysis and discussion of whether the above-listed information and data that show contamination of the groundwater is attributable to the petitioned waste:**

   Not applicable.

6. **Is the unsaturated (vadose) zone monitored at any of the subject units?**

   Not applicable. **[Skip to item 8]**

7. **Provide the following information on vadose zone monitoring (e.g. lysimetric information) in as much detail as possible (as requested for groundwater monitoring systems):**

    a. **A description of regional, local, and unit-specific geology and hydrogeology, and soil characteristics:**
    b. **A description of the monitoring system(s) (e.g. design and construction):**
    c. **A description of the sampling and analytical procedures followed:**
    d. **Analytical and QC data obtained from sample analysis:**
    e. **An interpretation of the information and data presented:**

   Not applicable.

8. **Discuss whether groundwater contamination exists on the site and, if it does, identify the source. If the source is not the petitioned waste, explain, with supporting information, why the petitioned waste has not contributed to the contamination:**

   Based on the analytical results presented in this petition, the Chem Mill wastewater sludge is not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment or nearby groundwater.

9. **Provide documentation on the waiver or exemption of groundwater monitoring at the land-based management unit containing the petitioned waste:**

   Not Applicable.

10. **Identify the units in question, provide estimates of the relative volumes of the petitioned and other wastes disposed in the unit, and discuss in detail why you consider groundwater data from these non-dedicated units are immaterial in evaluating the petitioned waste's impact on groundwater quality:**

    Based on the analytical results presented in this petition, the Chem Mill wastewater sludge is not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment or nearby groundwater.

11. **Describe why groundwater monitoring is not needed for your petitioned waste:**

    Based on the analytical results presented in this petition, the Chem Mill wastewater sludge is not reasonably expected to leach concentrations of chemicals that are hazardous in a landfill environment or nearby groundwater.

REFERENCES

SLR International Corporation (SLR). 2019. Sampling and Analysis Plan for Ongoing Chem Mill Process Sludge. Submitted to Oregon Department of Environmental Quality.

United States Environmental Protection Agency (USEPA). 2010. Delisting Risk Assessment Software (DRAS), Version 3.0. USEPA Region 5, Web Reference: https://www.epa.gov/hw/hazardous-waste-delisting-risk-assessment-software-dras

USEPA. 2009. Resource Conservation and Recovery Act Hazardous Waste Delisting Program - Useful Information for the Petitioner. USEPA Region 6, National Delisting Workgroup, Web Reference: http://www.epa.gov/earth1r6/6pd/rcra_c/pd-o/delist.htm

USEPA. 2008. RCRA Delisting Technical Support Document. Office of Solid Waste. Prepared by Multimedia Planning and Permitting Division. Updated by Land and Chemicals Division.

USEPA. 2002. RCRA Waste Sampling Draft Technical Guidance – Planning, Implementation, and Assessment. Office of Solid Waste, Web Reference: https://www.epa.gov/hw-sw846/draft-technical-guidance-about-waste-sampling-under-resource-conservation-and-recovery-act

USEPA, 1996. Method 5035, Revision 0, December 1996, Final Update III to the Third Edition of the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846. Web Reference: https://www.epa.gov/sites/production/files/2015-12/documents/5035.pdf

USEPA. 1993. Petitions to Delist Hazardous Wastes – A Guidance Manual, Second Edition. Science Applications International Corporation, Web Reference: https://nepis.epa.gov/Exe/ZyNET.exe/200125QL.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C00000017%5C200125QL.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

USEPA. 1992. Method 1311 – Toxicity Characteristic Leaching Procedure. Web Reference: https://www.epa.gov/sites/production/files/2015-12/documents/1311.pdf

TABLES

Table 1
Summary of State and Federal Permits
F006 Delisting Petition
Pacific Cast Technologies, Inc. dba ATI Cast Products
Albany, Oregon

Program	Permit No.	State or Federal Issued	Status
Title V Operating Permit	22-0011-TV-01	State	Active
Industrial Wastewater Discharge Permit	3369-02	State	Active
National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge General Permit	1200-Z	State	Active
NPDES Waste Discharge Permit	100-J	State	Active

Table 2
Constituents of Potential Concern (COPCs)
F006 Delisting Petition
Pacific Cast Technologies, Inc. dba ATI Cast Products
Albany, Oregon

Analyte Group	Individual Analytes	Total Concentration Test Method	TCLP Test Method
Metals	Cadmium	6010D	E1311/6020
	Chromium	6010D	E1311/6020
	Manganese	6010D	E1311/6020
	Molybdenum	6010D	E1311/6020
	Nickel	6010D	E1311/6020
	Silver	6010D	E1311/6020
	Vanadium	6010D	E1311/6020
	Zirconium	6020B	E1311/6020
Anions	Cyanide	9012B	E1311/E335.4
	Fluoride	9056A	E1311/E340.2
Metal Ion	Chromium (VI) (+6)	3060A/7196A	E1311/M3500 Cr B

Table 3
Chem Mill Wastewater Sludge Sampling Laboratory Analytical Results
F006 Delisting Petition
Pacific Cast Technologies, Inc. dba ATI Cast Products
Albany, Oregon

Analyte Group	Individual Analytes	Total Concentration Test Method[1,2]	TCLP Test Method	DRAS Maximum Allowable Total Concentration (mg/kg)[3]	DRAS Maximum Allowable TCLP Concentration (mg/l)[3]	TCLP RCRA Toxicity Characteristic Regulatory Levels (mg/l)	02/14/2019				02/20/2019		03/01/2019		03/07/2019	
							Period 1A		Period 1B		Period 2		Period 3		Period 4	
							Composite Sample		Composite Sample		Composite Sample		Composite Sample		Composite Sample	
							Total (mg/kg)[4]	TCLP (mg/l)[5]	Total (mg/kg)[4]	TCLP (mg/l)[5]	Total (mg/kg)[4]	TCLP (mg/l)[5]	Total (mg/kg)[4]	TCLP (mg/l)[5]	Total (mg/kg)[4]	TCLP (mg/l)[5]
Metals	Cadmium	6010D	E1311/6020	8,150	0.0911	1	< 0.773	-	< 0.850	-	< 7.97	<0.00500	2.98	<0.00500	2.69 (J)	<0.00500
	Chromium	6010D	E1311/6020	2,610	2.27	5	31.5	-	34.6	-	30.9 (J)	-	27.1	-	37.1 (J)	-
	Manganese	6010D	E1311/6020	779,000	15.7	--	30.3	-	30.4	-	30.4 (J)	-	32.2	-	32.2 (J)	-
	Molybdenum	6010D	E1311/6020	42,400,000	3.33	--	240	< 0.0250	244	< 0.0250	491	< 0.0250	487	< 0.0250	256	0.0268
	Nickel	6010D	E1311/6020	130,000	13.5	--	22.7	-	23.7 (J)	-	< 55.8	-	18.0	-	33.8 (J)	-
	Silver	6010D	E1311/6020	842,000	8.61	5	< 1.33	-	< 1.46	-	< 13.7	-	< 0.288	-	<4.60	-
	Vanadium	6010D	E1311/6020	42,400,000	3.77	--	4,420	< 0.0250	4,790	< 0.0250	3,840	< 0.0250	3,870	< 0.0250	4,650	< 0.0250
	Zirconium	6020B	E1311/6020	4,060	--	--	805 (V)	-	954	-	1,680 (V)	-	1,400	-	648 (V)	-
Anions	Cyanide	9012B	E1311/E335.4	467,000	3.08	--	0.634	-	1.09	-	0.798 (P1)	-	<0.281 (Q)[6]	-	0.316 (J)	-
	Fluoride	9056A	E1311/E340.2	508,000,000	39.2	--	123	-	139	-	124	-	132	-	107	-
Metal Ion	Chromium (VI) (+6)	3060A/7196A	E1311/M3500 Cr B	373	2.27	--	19.9 (J)	-	2.43 (J, J6, O1)	-	< 1.46	-	2.98 (J)	-	7.97	-

Notes:

1. Total concentration test method 6010 used to analyze metals, except Zirconium, was updated from version B to version D after Period 1 composite samples were collected.
2. Total concentration test method 6020 used to analyze Zirconium was updated from version A to version B after Period 1 composite samples were collected.
3. Maximum allowable total and TCLP concentration determined for Chem Mill process sludge from DRAS using example analyses and the following inputs:
    - Waste Management Unit Type - Landfill
    - Waste Volume - 9,000 cubic yards per year
    - Cancer Risk Level - 1E-6
    - Hazard Quotient (HQ) - 1.0
    - Waste management Unit Active Life - Multiple Year Batch
    - Active Life - 20 years
4. All Total analysis performed by Pace.
5. All TCLP analysis performed by Specialty.
6. Original Period 3 test result for total cyanide was 27.8 mg/L but may have contained matrix interference(s) from an unknown source. A subsequent analysis reported a concentration of <0.281 mg/kg. The analysis was performed four days beyond the holding time using less sample volume to eliminate possible interferences. Although the matrix interference is unknown, possible sources include nitrate and/or nitrite.

Highlighted in light gray: 20 times greater than DRAS Maximum Allowable TCLP Concentration values or 20 times greater than TCLP RCRA Toxicity Characteristic Regulatory Level values

- : TCLP Testing not performed

-- : No regulatory limit specified.

J: The identification of the analyte is acceptable; the reported value is an estimate.

J6: The sample matrix interfered with the ability to make any accurate determination; spike value is low.

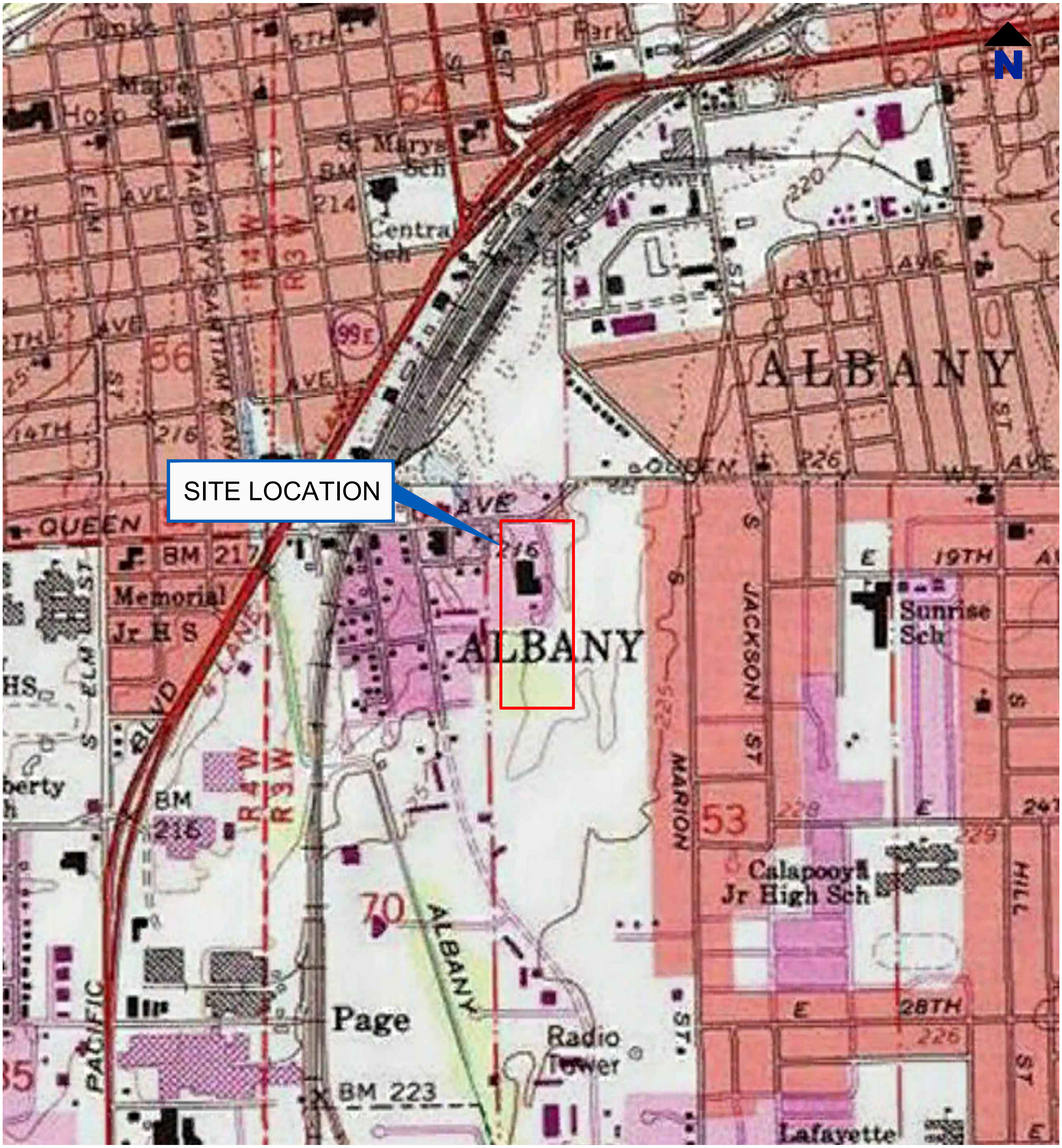
O1: The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

P1: RPD value not applicable for sample concentrations less than 5 times the reporting limit.

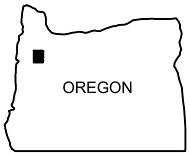
Q: Sample was prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

V: The sample concentration is too high to evaluate accurate spike recoveries.

FIGURES



REFERENCED FROM : USGS 7.5 MINUTE QUARDRANGLE
<ALBANY, OR 1994>



SCALE: 1" = 1,000'

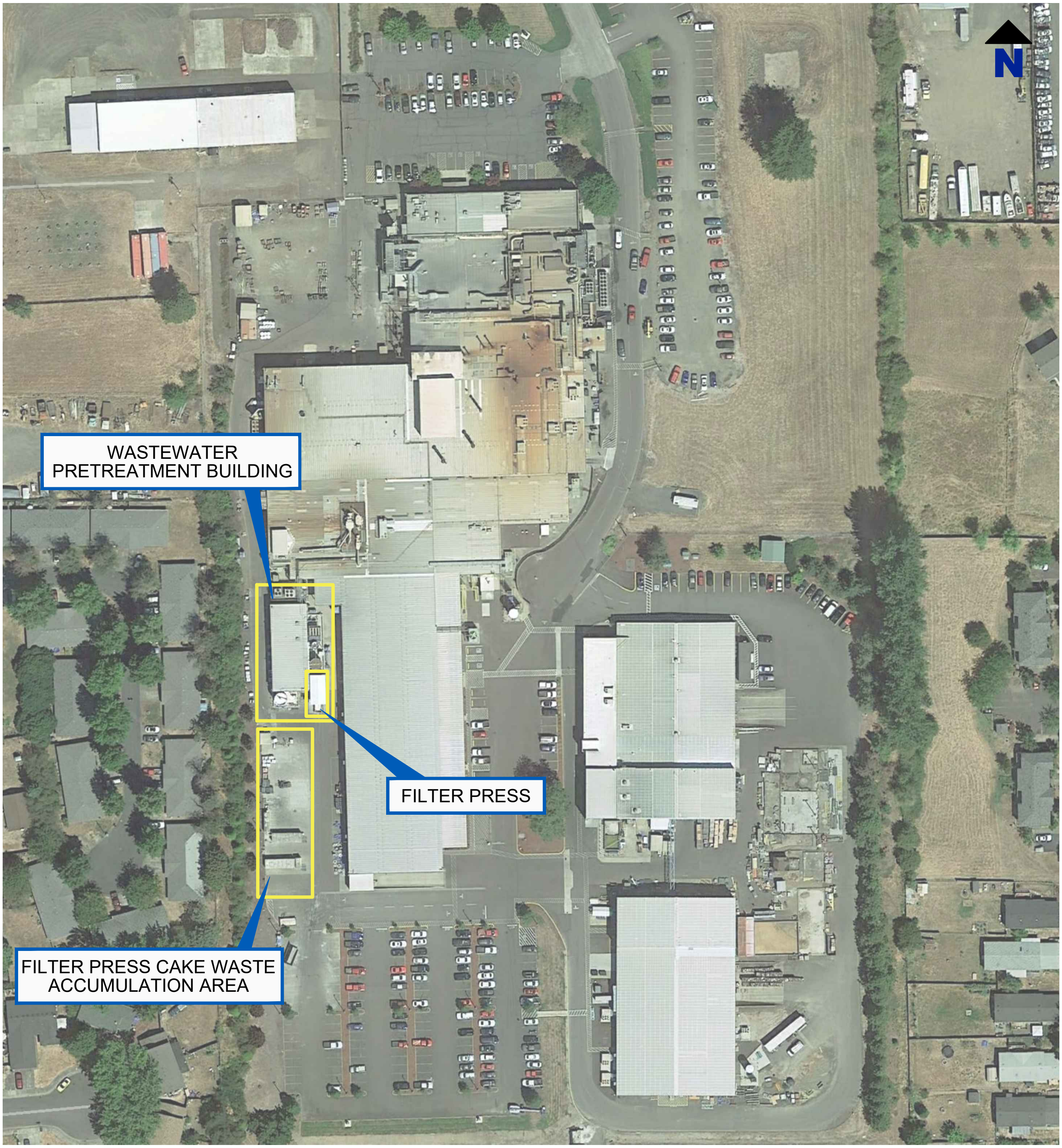
0 1,000 2,000 3,000'

PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
SITE LOCATION MAP

Date	March 2019	Scale	As shown	Fig. No.	1
File Name	ATI Delisting Figures	Project No.	108.00341.00014		



AERIAL IMAGE PROVIDED BY GOOGLE EARTH, 2018

SCALE: 1" = 150'

SLR

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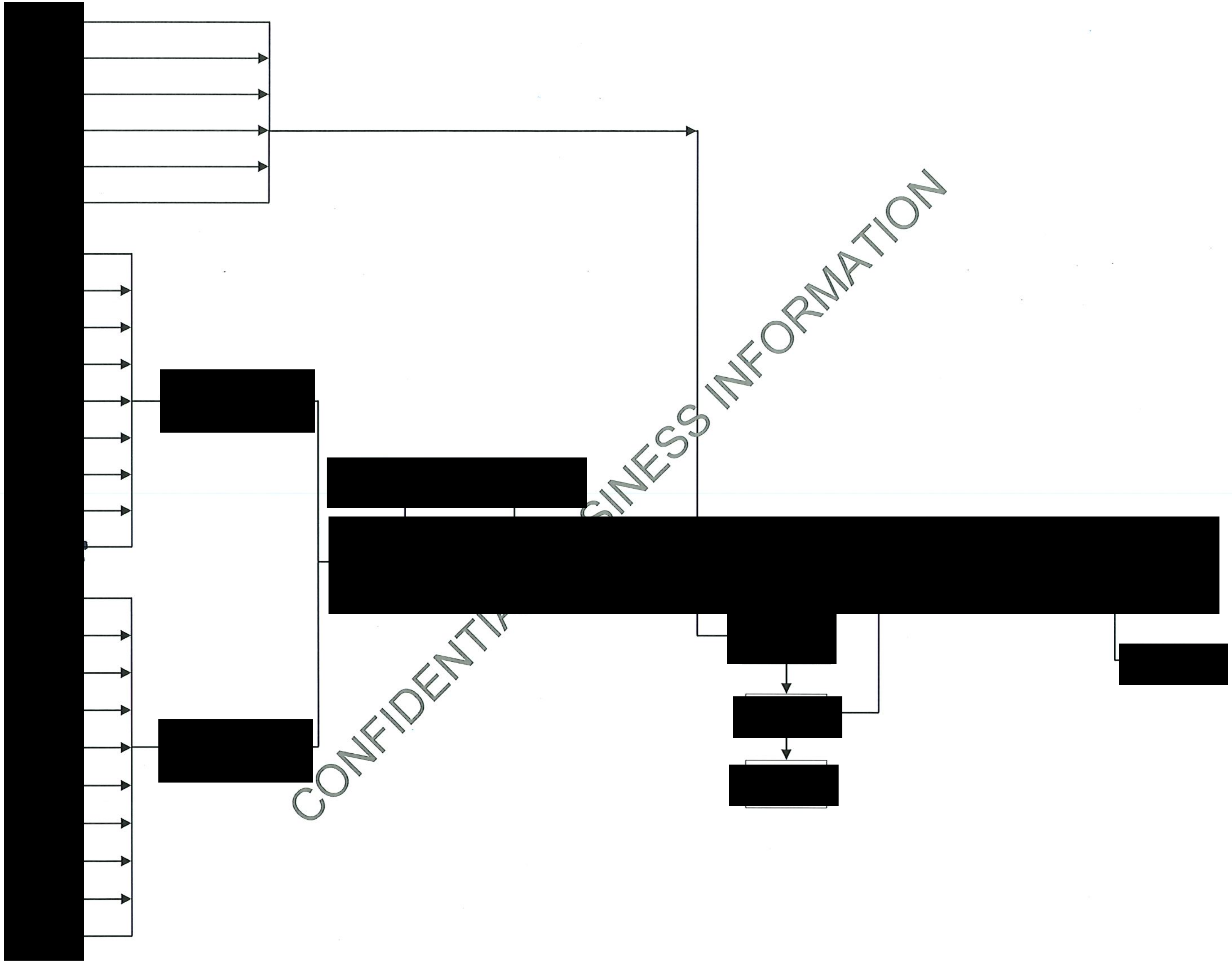
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
SITE LAYOUT

Date March 2019
Scale As shown
Fig. No. 2
File Name ATI Delisting Figures
Project No. 108.00341.00014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NOTES

LEGEND

[redacted]

PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

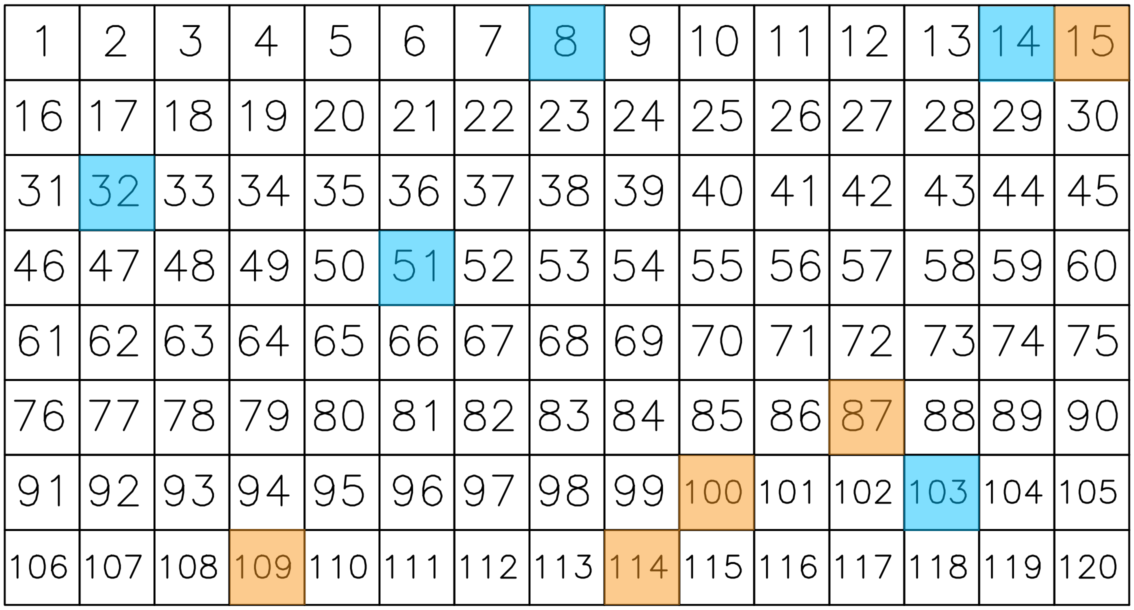
Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
ATI WASTEWATER TREATMENT PROCESS FLOW DIAGRAM

Date	March 2019	Scale	Not to scale	Fig. No. 3
File Name	ATI Delisting Figures	Project No.	108.00341.00014	

SLR

BIN TOP VIEW (15' by 8')



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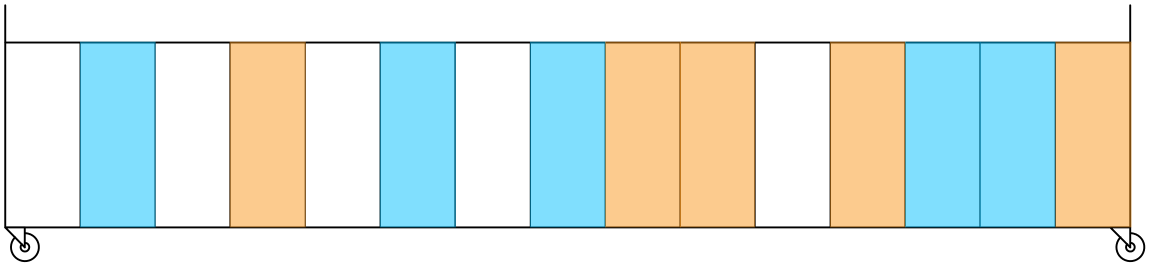
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

BIN SIDE VIEW (4')



NOTES

1. PERIOD 1A AND 1B COMPOSITE SAMPLES WERE COLLECTED ON FEBRUARY 14, 2019.
2. PERIOD 1A ALIQUOT LOCATIONS ARE SHOWN IN BLUE.
3. PERIOD 1B ALIQUOT LOCATIONS ARE SHOWN IN ORANGE.
4. FIVE ALIQUOTS WERE COLLECTED AND COMPOSITED FOR A SINGLE DISCRETE SAMPLE.
5. EACH ALIQUOT WAS COLLECTED AS A VERTICAL FULL COLUMN OF WASTE FROM THE TOP TO THE BOTTOM OF THE BIN.
6. LOCATIONS OF THE ALIQUOTS WITHIN THE BIN WERE SELECTED RANDOMLY FROM THE GRID FORMATION.

SLR

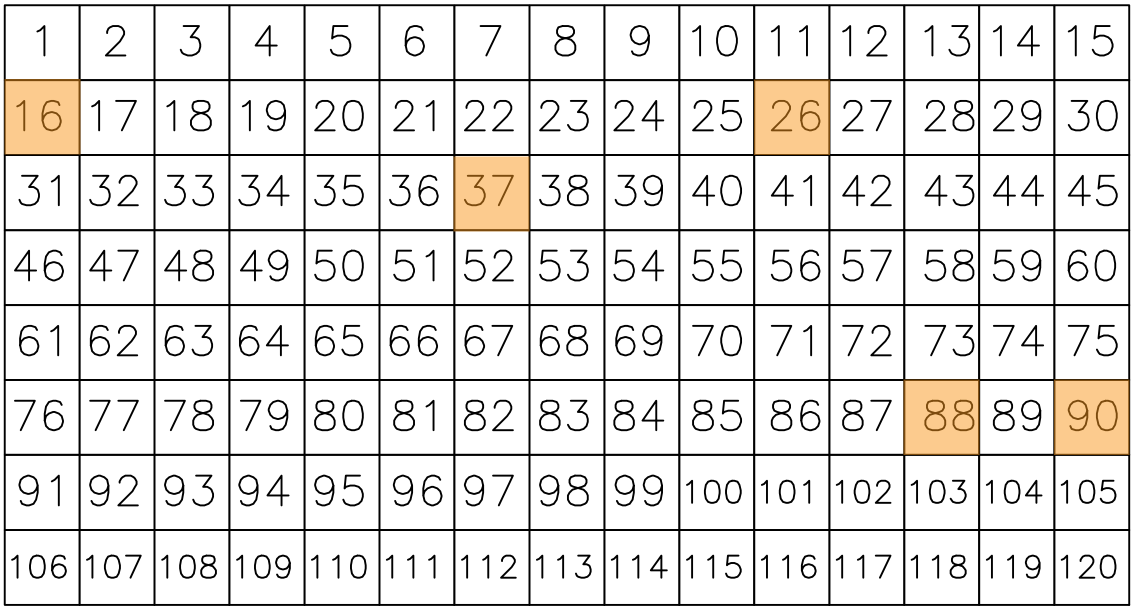
PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
PERIOD 1A AND 1B ALIQUOT LOCATIONS

Date March 2019
Scale Not to scale
Fig. No. 4
File Name ATI Delisting Figures
Project No. 108.00341.00014

BIN TOP VIEW (15' by 8')



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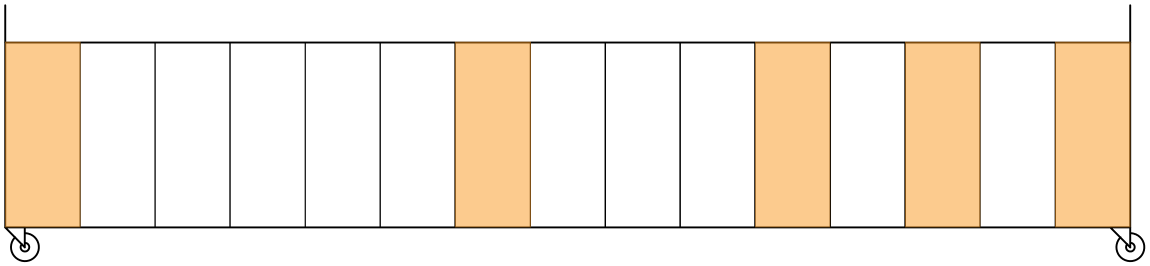
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

BIN SIDE VIEW (4')



NOTES

1. PERIOD 2 COMPOSITE SAMPLE WAS COLLECTED ON FEBRUARY 20, 2019.
2. PERIOD 2 ALIQUOT LOCATIONS ARE SHOWN IN ORANGE.
3. FIVE ALIQUOTS WERE COLLECTED AND COMPOSITED FOR A SINGLE DISCRETE SAMPLE.
4. EACH ALIQUOT WAS COLLECTED AS A VERTICAL FULL COLUMN OF WASTE FROM THE TOP TO THE BOTTOM OF THE BIN.
5. LOCATIONS OF THE ALIQUOTS WITHIN THE BIN WERE SELECTED RANDOMLY FROM THE GRID FORMATION.

SLR

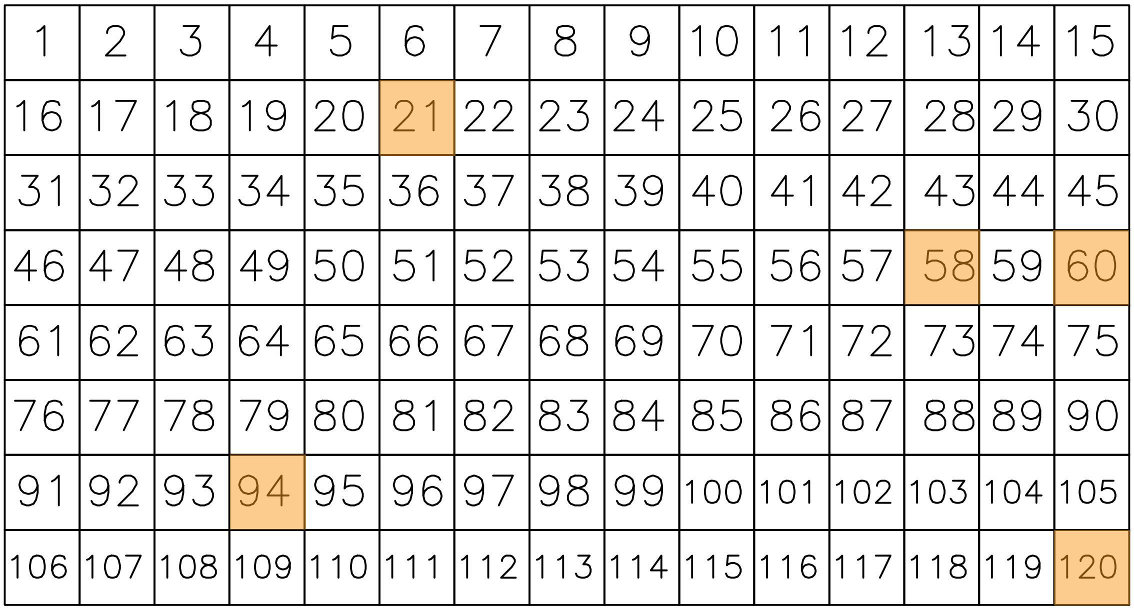
PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
PERIOD 2 ALIQUOT LOCATIONS

Date March 2019
File Name ATI Delisting Figures
Scale Not to scale
Project No. 108.00341.00014
Fig. No. 5

BIN TOP VIEW (15' by 8')



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61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
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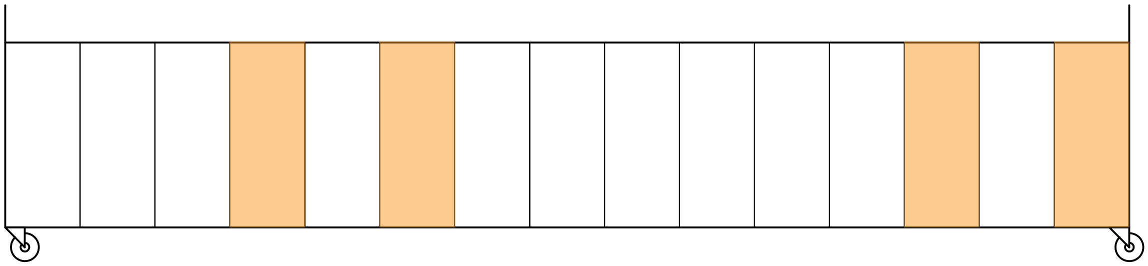
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

BIN SIDE VIEW (4')



NOTES

1. PERIOD 3 COMPOSITE SAMPLE WAS COLLECTED ON MARCH 01, 2019.
2. PERIOD 3 ALIQUOT LOCATIONS ARE SHOWN IN ORANGE.
3. FIVE ALIQUOTS WERE COLLECTED AND COMPOSITED FOR A SINGLE DISCRETE SAMPLE.
4. EACH ALIQUOT WAS COLLECTED AS A VERTICAL FULL COLUMN OF WASTE FROM THE TOP TO THE BOTTOM OF THE BIN.
5. LOCATIONS OF THE ALIQUOTS WITHIN THE BIN WERE SELECTED RANDOMLY FROM THE GRID FORMATION.

SLR

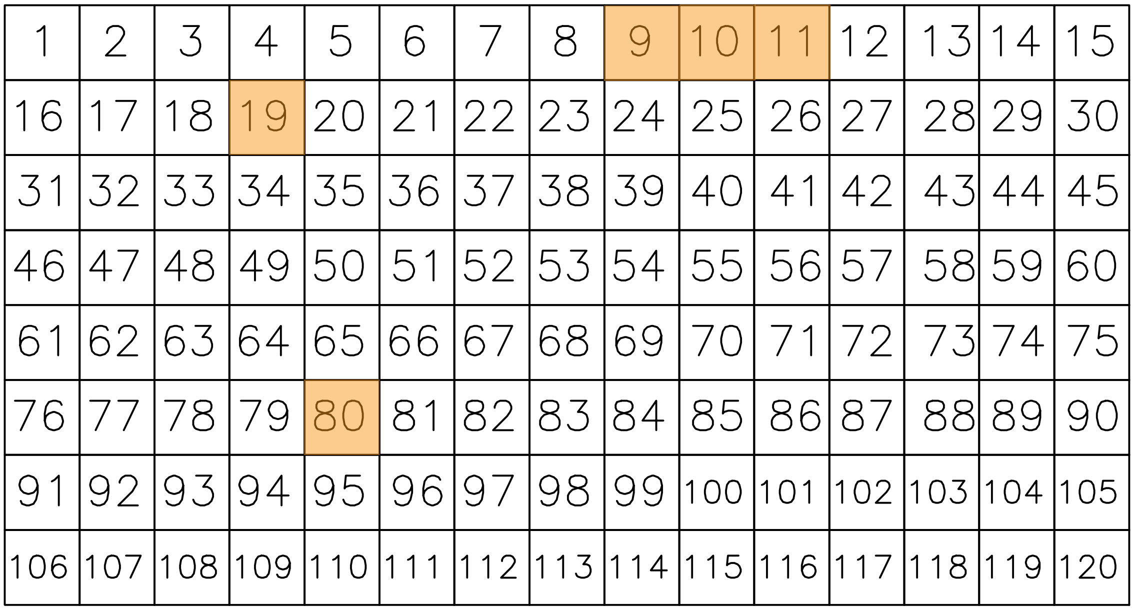
PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
PERIOD 3 ALIQUOT LOCATIONS

Date March 2019
File Name ATI Delisting Figures
Scale Not to scale
Project No. 108.00341.00014
Fig. No. 6

BIN TOP VIEW (15' by 8')



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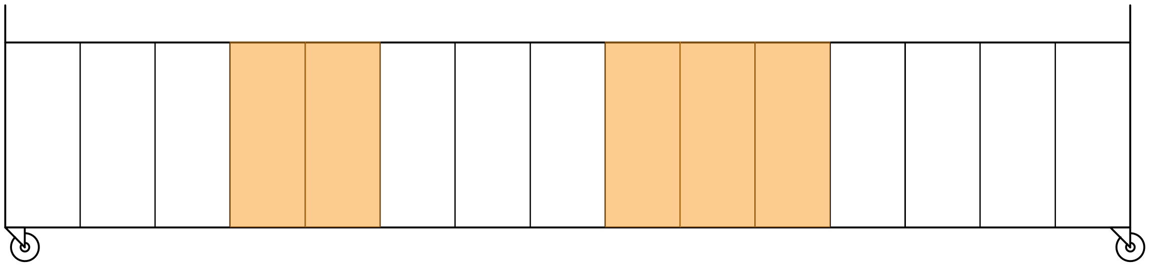
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

BIN SIDE VIEW (4')



NOTES

1. PERIOD 4 COMPOSITE SAMPLE WAS COLLECTED ON MARCH 01, 2019.
2. PERIOD 4 ALIQUOT LOCATIONS ARE SHOWN IN ORANGE.
3. FIVE ALIQUOTS WERE COLLECTED AND COMPOSITED FOR A SINGLE DISCRETE SAMPLE.
4. EACH ALIQUOT WAS COLLECTED AS A VERTICAL FULL COLUMN OF WASTE FROM THE TOP TO THE BOTTOM OF THE BIN.
5. LOCATIONS OF THE ALIQUOTS WITHIN THE BIN WERE SELECTED RANDOMLY FROM THE GRID FORMATION.

PACIFIC CAST TECHNOLOGIES, INC. DBA
ATI CAST PRODUCTS
150 QUEEN AVENUE SW
ALBANY, OR 97322

Report
DELISTING PETITION FOR F006 HAZARDOUS WASTE

Drawing
PERIOD 4 ALIQUOT LOCATIONS

Date March 2019
File Name ATI Delisting Figures
Scale Not to scale
Project No. 108.00341.00014
Fig. No. 7

APPENDIX A

LABORATORY TESTING INFORMATION

Pace National Equipment List

ID	Manufacturer	Model
L1076708		
DR6000-1	Hach	DR6000
LOGBAL4	Mettler	MS2O4TS/00
IC-11	Dionex	ICS 2100
LACHAT4	Lachat	Quikchem 8500
ICP14	Thermo	ICAP 7400 DUO
L1076713		
ICPMS9	Agilent	7900
L1074837		
LACHAT4	Lachat	Quikchem 8500
DR6000-1	Hach	DR6000
LOGBAL3	Mettler	XS2O4
IC-11	Dionex	ICS 2100
ICP14	Thermo	ICAP 7400 DUO
L1074839		
ICPMS7	Agilent	7700
L1072394		
ICP12	Thermo	7400
DR6000-2	Hach	DR6000
LOGBAL1	Mettler	MS204S
IC-11	Dionex	ICS 2100
LACHAT4	Lachat	Quikchem 8500
ICP14	Thermo	ICAP 7400 DUO
L1072407		
ICPMS7	Agilent	7700
L1070446		
DR6000-2	Hach	DR6000
LOGBAL1	Mettler	MS204S
IC-11	Dionex	ICS 2100
ICP13	Thermo	ICAP 7400 DUO
LACHAT4	Lachat	Quikchem 8500
L1070452		
ICPMS7	Agilent	7700

Pace National Employee List

Analyst Name	ID #	Job Title	Analysis/ Instrumentation	Years of Exp.	Education/Year Graduated
WetChem					
Taylor Hammack	820	Assistant Chemist	Prep	<1	B.S. Chemistry, 2017
Josh Roberts	512	Assistant Chemist	Gravimetric, LaChat	7	B.S. Computer Science, 2013
Mary Garrett	183	Chemist	Prep, LaChat, IC	11	A.S. Chemistry, 2013 + 11 years lab experience
Simo Tami	447	Chemist	ICP/ICPMS	9	M.S. Chemistry/B.S. Chemistry, 2000
Susanne Morris	723	Chemist	TOC, TOX	9	B.S. Biology, 2009
Erica MCNeese	854	Assistant Chemist	Short Holds	<1	B.S. Biotechnology, 2013
Meredith Westbrook	901	Assistant Chemist	Short Holds	<1	B.S. Biology, 2017
Metals					
Taylor Baldwin	708	Assistant Chemist	ICP/Hg	2	B.S. Forensic Science, 2015
Elizabeth Lerch	684	Assistant Chemist	Metals Prep, Hg	3	3 year college
Charles Evans	572	Chemist	Hg/ICP	10	B.S. Mathematics , 2003
Stacia Draper	701	Lab Technician	Metals Prep	2	H.S. + some college
Brad Dawson	136	Chemist	ICP/ ICPMS	13	B.S. Chemistry, 2003
Jeremy Gupton	388	Metals Department Lead	ICP/ ICPMS	18	H.S. + 9 years login + 9 years lab experience
Thomas Moore	828	Assistant Chemist	TCLP	<1	B.S. Biology, 2017
TS					
Jonathan Deboard	832	TS Analyst	Total Solids	1	High School/Some college
Kelisha Stamps	940	Lab Tech	Prep	<1	B.S. Professional Geology,2018

SPECIALTY ANALYTICAL INSTRUMENT LIST

Department	Inst. ID	Instrument Description	Serial #
Metals	ICPMS	PE NexION-350	85VN4121301
Metals	CVAF	CETAC Quick Trace M-8000	10801QM8
GCMS VOL	5973J	Agilent GC:6890/MS:5973	US00023631/US82311218
GCMS VOL	5975X	Agilent GC:7890/MS:5975C	CN10817045/US80629090
GCMS SEMI	5973G	Agilent GC:6890/MS:5973	US00005558/US63810119
GCMS SEMI	5973P	Agilent GC:6890/MS:5973	CN10433066/US94260132
GCMS SEMI	5975Q	Agilent GC:6890/MS:5975	CN10547200/US54421616
GC SEMI	GC-M	Agilent GC:6890 (FID)	US00031528
GC SEMI	GC-O	Agilent GC:6890 (FID)	US10151052
GC VOL	GC-S	Agilent 7890 (PID/FID)	CN10823116
PEST	GCK	Agilent 6890 (Dual ECD)	US00022531
PEST	GC-R	Agilent 7890 (Dual ECD)	CN1081302
Wetchem	LACHAT	Lachat QuickChem FIA+	A83000-1484
Wetchem	DIONEX2100	Dionex ICS-2100	12081157
Wetchem	IC	Dionex IC DX-120	99110575
Wetchem	HPLC	Agilent HPLC	DE63055546/DE63059850
Wetchem	MANTECH	Mantech PC-Titrate	MS-OJ3-348
Wetchem	TOC-APOLLO	Tekmar Apollo 9000	US01152005
Wetchem	GENESYS	Thermo Genesys 20	3SGS155006
Wetchem	OIFS3100	OI FS3100	21831323
Wetchem	PH Accumet	Fisher PH Accumet	9120030
Wetchem	TURB	VWR 6612-200 Turbidity	TUR800 1944
Wetchem	Analytical Balance	Denver Insturment Co. A-160	N0083453
Wetchem	COND	Jenway Conductivity Meter 4310	2807
Wetchem	FLASH	Koehler 16200	R61091101
MICRO	Autoclave	Market Forge STM-E Autoclave	Jul-85
MICRO	Dissolved Oxygen Meter	YSI-5100-115V	08A101589
MICRO	BOD_INC	Norlake Scientific	7061391
MICRO	INCUBATOR	Fisher @35°	911N0297
MICRO	INCUBATOR	Fisher @44.5°	204N0056
ALL	Nanopure	Barnstead Nanpure II	8810086

SPECIALTY ANALYTICAL EMPLOYEE LIST

NAME:	HIRE DATE:	EDUCATION:	TECH SPECIALTY
Andrew Riddell	02/2012	B.S. Chemistry	Chemist
Austin Mobley	10/2017	B.S. Biology	Organic Analyst
Ben Walker	01/2014	B.S. BioChemistry	Inorganic/Organic Analyst
Chris Knox	03/2013	B.S. Chemistry	Vol/Semi Organic Analyst
Emma Gibson	10/2018	B.A. Cinematic Arts & Tech / 1st Year AAS Fisheries Tech	Organic Prep
Jacob Tietsort	09/2015	B.S. Biology	Inorganic Analyst
Julie Clay	07/2003	B.S. Biology	Operations Manager / Inorganic/Organic Analyst
Katherine Lynch	04/2017	B.S. Biology/ Conservation & Environmental Science	Admin / Project Management
Marty French	1997	B.S. Chemistry/Biology	Lab Director
Mandy Wehe	1/2019	A.S. Visual Communications	Courier
Samantha Hass	2/2019	B.S. Environmental Science	Project Management / Lab Assistant
Sumer Tipton	07/2018	B.S. Earth Science	Organic Prep

APPENDIX B

FILTER PRESS CAKE PERIOD 1A AND 1B ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD.

APPENDIX C

FILTER PRESS CAKE PERIOD 2 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD.

APPENDIX D

FILTER PRESS CAKE PERIOD 3 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD.

APPENDIX E

FILTER PRESS CAKE PERIOD 4 ANALYTICAL REPORTS

Analytical results are included on enclosed Data CD.

APPENDIX F

DRAS ANALYSES FILES

DRAS analyses files are included on enclosed Data CD.

State of Oregon Department of Environmental Quality

OAR 340-101-0004
Appendix 3 – Toxic Characteristics Leaching Procedure

METHOD 1311

TOXICITY CHARACTERISTIC LEACHING PROCEDURE

1.1 SCOPE AND APPLICATION

1.2 The TCLP is designed to determine the mobility of both organic and inorganic analytes present in liquid, solid, and multiphasic wastes.

1.3 If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run.

1.4 If an analysis of any one of the liquid fractions of the TCLP extract indicates that a regulated compound is present at such high concentra- tions that, even after accounting for dilution from the other fractions of the extract, the concentration would be above the regulatory level for that compound, then the waste is hazardous and it is not necessary to analyze the remaining fractions of the extract.

1.5 If an analysis of extract obtained using a bottle extractor shows that the concentration of any regulated volatile analyte exceeds the regulatory level for that compound, then the waste is hazardous and extraction using the ZHE is not necessary. However, extract from a bottle extractor cannot be used to demonstrate that the concentration of volatile compounds is below the regulatory level.

2.1 SUMMARY OF METHOD

2.2 For liquid wastes (i.e., those containing less than 0.5% dry solid material), the waste, after filtration through a 0.6 to 0.8 µm glass fiber filter, is defined as the TCLP extract.

2.3 For wastes containing greater than or equal to 0.5% solids, the liquid, if any, is separated from the solid phase and stored for later analysis; the particle size of the solid phase is reduced, if necessary. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase. The extraction fluid employed is a function of the alkalinity of the solid phase of the waste. A special extractor vessel is used when testing for volatile analytes (see Table 1 for a list of volatile compounds). Following extraction, the liquid extract is separated from the solid phase by filtration through a 0.6 to 0.8 µm glass fiber filter.

2.4 If compatible (i.e., multiple phases will not form on combination), the initial liquid phase of the waste is added to the liquid extract, and these are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume-weighted average concentration.

3.1 INTERFERENCES

3.2 Potential interferences that may be encountered during analysis are discussed in the individual analytical methods.

4.1 APPARATUS AND MATERIALS

4.2 Agitation apparatus: The agitation apparatus must be capable of rotating the extraction vessel in an end-over-end fashion (see Figure 1) at 30 ± 2 rpm. Suitable devices known to EPA are identified in Table 2.

4.3 Extraction Vessels

4.3.1 Zero-Headspace Extraction Vessel (ZHE). This device is for use only when the waste is being tested for the mobility of volatile analytes (i.e., those listed in Table 1). The ZHE (depicted in Figure 2) allows for liquid/solid separation within the device, and effectively precludes headspace. This type of vessel allows for initial liquid/solid separation, extraction, and final extract filtration without opening the vessel (see Section 4.3.1). The vessels shall have an internal volume of 500-600 mL, and be equipped to accommodate a 90-110 mm filter. The devices contain VITON®[1] O-rings which should be replaced frequently. Suitable ZHE devices known to EPA are identified in Table 3.

For the ZHE to be acceptable for use, the piston within the ZHE should be able to be moved with approximately 15 psi or less. If it takes more pressure to move the piston, the O-rings in the device should be replaced. If this does not solve the problem, the ZHE is unacceptable for TCLP analyses and the manufacturer should be contacted.

The ZHE should be checked for leaks after every extraction. If the device contains a built-in pressure gauge, pressurize the device to 50 psi, allow it to stand unattended for 1 hour, and recheck the pressure. If the device does not have a built-in pressure gauge, pressurize the device to 50 psi, submerge it in water, and check for the presence of air bubbles escaping from any of the fittings. If pressure is lost, check all fittings and inspect and replace O-rings, if necessary. Retest the device. If leakage problems cannot be solved, the manufacturer should be contacted.

Some ZHEs use gas pressure to actuate the ZHE piston, while others use mechanical pressure (see Table 3). Whereas the volatiles procedure (see Section 7.3) refers to pounds per square inch (psi), for the mechanically actuated piston, the pressure applied is measured in torque-inch-pounds. Refer to the manufacturer's instructions as to the proper conversion.

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[1] VITON® is a trademark of Du Pont.

4.3.2 Bottle Extraction Vessel. When the waste is being evaluated using the nonvolatile extraction, a jar with sufficient capacity to hold the sample and the extraction fluid is needed. Headspace is allowed in this vessel.

The extraction bottles may be constructed from various materials, depending on the analytes to be analyzed and the nature of the waste (see Section 4.3.3). It is recommended that borosilicate glass bottles be used instead of other types of glass, especially when inorganics are of concern. Plastic bottles, other than polytetrafluoroethylene, shall not be used if organics are to be investigated. Bottles are available from a number of laboratory suppliers. When this type of extraction vessel is used, the filtration device discussed in Section 4.3.2 is used for initial liquid/solid separation and final extract filtration.

4.4 Filtration Devices: It is recommended that all filtrations be performed in a hood.

4.4.1 Zero-Headspace Extractor Vessel (ZHE): When the waste is evaluated for volatiles, the zero-headspace extraction vessel described in Section 4.2.1 is used for filtration. The device shall be capable of supporting and keeping in place the glass fiber filter and be able to withstand the pressure needed to accomplish separation (50 psi).

NOTE: When it is suspected that the glass fiber filter has been ruptured, an in-line glass fiber filter may be used to filter the material within the ZHE.

4.4.2 Filter Holder: When the waste is evaluated for other than volatile analytes, any filter holder capable of supporting a glass fiber filter and able to withstand the pressure needed to accomplish separation may be used. Suitable filter holders range from simple vacuum units to relatively complex systems capable of exerting pressures of up to 50 psi or more. The type of filter holder used depends on the properties of the material to be filtered (see Section 4.3.3). These devices shall have a minimum internal volume of 300 mL and be equipped to accommodate a minimum filter size of 47 mm (filter holders having an internal capacity of 1.5 L or greater, and equipped to accommodate a 142 mm diameter filter, are recommended). Vacuum filtration can only be used for wastes with low solids content (<10%) and for highly granular, liquid-containing wastes. All other types of wastes should be filtered using positive pressure filtration. Suitable filter holders known to EPA are shown in Table 4.

4.4.3 Materials of Construction: Extraction vessels and filtration devices shall be made of inert materials which will not leach or absorb waste components. Glass, polytetrafluoroethylene (PTFE), or type 316 stainless steel equipment may be used when evaluating the mobility of both organic and inorganic components. Devices made of high density polyethylene (HDPE), polypropylene (PP), or polyvinyl chloride (PVC) may be used only when evaluating the mobility of metals. Borosilicate glass bottles are recommended for use over other types of glass bottles, especially when inorganics are analytes of concern.

4.5 Filters: Filters shall be made of borosilicate glass fiber, shall contain no binder materials, and shall have an effective pore size of 0.6 to 0.8 µm, or equivalent. Filters known to EPA which meet these specifications are identified in Table 5. Pre-filters must not be used. When evaluating the mobility of metals, filters shall be acid-washed prior to use by rinsing with 1N nitric acid followed by three consecutive rinses with deionized distilled water (a minimum of 1 L per rinse is recommended). Glass fiber filters are fragile and should be handled with care.

4.5 pH Meters: The meter should be accurate to ±0.05 units at 25 °C.

4.6 ZHE Extract Collection Devices: TEDLAR®[2] bags or glass, stainless steel or PTFE gas-tight syringes are used to collect the initial liquid phase and the final extract of the waste when using the ZHE device. The devices listed are recommended for use under the following conditions:

4.6.1 If a waste contains an aqueous liquid phase or if a waste does not contain a significant amount of nonaqueous liquid (<u>i.e.</u>, <1% of total waste), the TEDLAR® bag or a 600 mL syringe should be used to collect and combine the initial liquid and solid extract.

4.6.2 If a waste contains a significant amount of nonaqueous liquid in the initial liquid phase (<u>i.e.</u>, >1% of total waste), the syringe or the TEDLAR® bag may be used for both the initial solid/liquid separation and the final extract filtration. However, analysts should use one or the other, not both.

4.6.3 If the waste contains no initial liquid phase (is 100% solid) or has no significant solid phase (is 100% liquid), either the TEDLAR® bag or the syringe may be used. If the syringe is used, discard the first 5 mL of liquid expressed from the device. The remaining aliquots are used for analysis.

4.7 ZHE Extraction Fluid Transfer Devices: Any device capable of transferring the extraction fluid into the ZHE without changing the nature of the extraction fluid is acceptable (<u>e.g.</u>, a positive displacement or peristaltic pump, a gas tight syringe, pressure filtration unit (see Section 4.3.2), or other ZHE device).

4.8 Laboratory Balance: Any laboratory balance accurate to within ±0.01 grams may be used (all weight measurements are to be within ±0.1 grams).

4.9 Beaker or Erlenmeyer flask, glass, 500 mL.

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[2] TEDLAR® is a registered trademark of Du Pont.

4.10 Watchglass, appropriate diameter to cover beaker or Erlenmeyer flask.

4.11 Magnetic stirrer.

5.1 REAGENTS

5.2 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.3 Reagent Water. Reagent water is defined as water in which an interferant is not observed at or above the method's detection limit of the analyte(s) of interest. For nonvolatile extractions, ASTM Type II water or equivalent meets the definition of reagent water. For volatile extractions, it is recommended that reagent water be generated by any of the following methods. Reagent water should be monitored periodically for impurities.

5.3.1 Reagent water for volatile extractions may be generated by passing tap water through a carbon filter bed containing about 500 grams of activated carbon (Calgon Corp., Filtrasorb-300 or equivalent).

5.3.2 A water purification system (Millipore Super-Q or equivalent) may also be used to generate reagent water for volatile extractions.

5.3.3 Reagent water for volatile extractions may also be prepared by boiling water for 15 minutes. Subsequently, while maintaining the water temperature at 90 ± 5 degrees C, bubble a contaminant-free inert gas (e.g. nitrogen) through the water for 1 hour. While still hot, transfer the water to a narrow mouth screw-cap bottle under zero-headspace and seal with a Teflon-lined septum and cap.

5.4 Hydrochloric acid (1N), HCl, made from ACS reagent grade.

5.5 Nitric acid (1N), HNO_3, made from ACS reagent grade.

5.6 Sodium hydroxide (1N), $NaOH$, made from ACS reagent grade.

5.7 Glacial acetic acid, CH_3CH_2OOH, ACS reagent grade.

5.8 Extraction fluid.

5.8.1 Extraction fluid # 1: Add 5.7 mL glacial CH_3CH_2OOH to 500 mL of reagent water (See Section 5.2), add 64.3 mL of 1N NaOH, and dilute to a volume of 1 liter. When correctly prepared, the pH of this fluid will be 4.93 ±0.05.

5.8.2 Extraction fluid # 2: Dilute 5.7 mL glacial CH_3CH_2OOH with reagent water (See Section 5.2) to a volume of 1 liter. When correctly prepared, the pH of this fluid will be 2.88 ± 0.05.

NOTE: These extraction fluids should be monitored frequently for impurities. The pH should be checked prior to use to ensure that these fluids are made up accurately. If impurities are found or the pH is not within the above specifications, the fluid shall be discarded and fresh extraction fluid prepared.

5.9 Analytical standards shall be prepared according to the appropriate analytical method.

6.1 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.2 All samples shall be collected using an appropriate sampling plan.

6.3 The TCLP may place requirements on the minimal size of the field sample, depending upon the physical state or states of the waste and the analytes of concern. An aliquot is needed for preliminary evaluation of which extraction fluid is to be used for the nonvolatile analyte extraction procedure. Another aliquot may be needed to actually conduct the nonvolatile extraction (see Section 1.4 concerning the use of this extract for volatile organics). If volatile organics are of concern, another aliquot may be needed. Quality control measures may require additional aliquots. Further, it is always wise to collect more sample just in case something goes wrong with the initial attempt to conduct the test.

6.3 Preservatives shall not be added to samples before extraction.

6.4 Samples may be refrigerated unless refrigeration results in irreversible physical change to the waste. If precipitation occurs, the entire sample (including precipitate) should be extracted.

6.5 When the waste is to be evaluated for volatile analytes, care shall be taken to minimize the loss of volatiles. Samples shall be collected and stored in a manner intended to prevent the loss of volatile analytes (e.g., samples should be collected in Teflon-lined septum capped vials and stored at 4 °C. Samples should be opened only immediately prior to extraction).

6.6 TCLP extracts should be prepared for analysis and analyzed as soon as possible following extraction. Extracts or portions of extracts for metallic analyte determinations must be acidified with nitric acid to a pH < 2, unless precipitation occurs (see Section 7.2.14 if precipitation occurs). Extracts should be preserved for other analytes according to the guidance given in the individual analysis methods. Extracts or portions of extracts for organic analyte determinations shall not be allowed to come into contact with the atmosphere (i.e., no headspace) to prevent losses. See Section 8.0 (QA requirements) for acceptable sample and extract holding times.

7.1 PROCEDURE

7.2 Preliminary Evaluations

Perform preliminary TCLP evaluations on a minimum 100 gram aliquot of waste. This aliquot may not actually undergo TCLP extraction. These preliminary evaluations include: (1) determination of the percent solids (Section 7.1.1);
(2) determination of whether the waste contains insignificant solids and is, therefore, its own extract after filtration (Section 7.1.2); (3) determination of whether the solid portion of the waste requires particle size reduction (Section 7.1.3); and (4) determination of which of the two extraction fluids are to be used for the nonvolatile TCLP extraction of the waste (Section 7.1.4).

7.1.1 Preliminary determination of percent solids: Percent solids is defined as that fraction of a waste sample (as a percentage of the total sample) from which no liquid may be forced out by an applied pressure, as described below.

7.1.1.1 If the waste will obviously yield no liquid when subjected to pressure filtration (i.e., is 100% solids) proceed to Section 7.1.3.

7.1.1.2 If the sample is liquid or multiphasic, liquid/solid separation to make a preliminary determination of percent solids is required. This involves the filtration device described in Section 4.3.2 and is outlined in Sections 7.1.1.3 through 7.1.1.9.

7.1.1.3 Pre-weigh the filter and the container that will receive the filtrate.

7.1.1.4 Assemble the filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure.

7.1.1.5 Weigh out a subsample of the waste (100 gram minimum) and record the weight.

7.1.1.6 Allow slurries to stand to permit the solid phase to settle. Wastes that settle slowly may be centrifuged prior to filtration. Centrifugation is to be used only as an aid to filtration. If used, the liquid should be decanted and filtered followed by filtration of the solid portion of the waste through the same filtration system.

7.1.1.7 Quantitatively transfer the waste sample to the filter holder (liquid and solid phases). Spread the waste sample evenly over the surface of the filter. If filtration of the waste at 4 °C reduces the amount of expressed liquid over what would be expressed at room temperature then allow the sample to warm up to room temperature in the device before filtering.

NOTE: If waste material (>1% of original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Section 7.1.1.5 to determine the weight of the waste sample that will be filtered.

Gradually apply vacuum or gentle pressure of 1-10 psi, until air or pressurizing gas moves through the filter. If this point is not reached under 10 psi, and if no additional liquid has passed through the filter in any 2 minute interval, slowly increase the pressure in 10 psi increments to a maximum of 50 psi. After each incremental increase of 10 psi, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2 minute interval, proceed to the next 10 psi increment. When the pressurizing gas begins to move through the filter, or when liquid flow has ceased at 50 psi (i.e., filtration does not result in any additional filtrate within any 2 minute period), stop the filtration.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.1.1.8 The material in the filter holder is defined as the solid phase of the waste, and the filtrate is defined as the liquid phase.

NOTE: Some wastes, such as oily wastes and some paint wastes, will obviously contain some material that appears to be a liquid. Even after applying vacuum or pressure filtration, as outlined in Section 7.1.1.7, this material may not filter. If this is the case, the material within the filtration device is defined as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.1.1.9 Determine the weight of the liquid phase by subtracting the weight of the filtrate container (see Section 7.1.1.3) from the total weight of the filtrate-filled container. Determine the weight of the solid phase of the waste sample by subtracting the weight of the liquid phase from the weight of the total waste sample, as determined in Section 7.1.1.5 or 7.1.1.7.

Record the weight of the liquid and solid phases. Calculate the percent solids as follows:

$$\text{Percent solids} = \frac{\text{Weight of solid (Section 7.1.1.9)}}{\text{Total weight of waste (Section 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2 If the percent solids determined in Section 7.1.1.9 is equal to or greater than 0.5%, then proceed either to Section 7.1.3 to determine whether the solid material requires particle size reduction or to Section 7.1.2.1 if it is noticed that a small amount of the filtrate is entrained in wetting of the filter. If the percent solids determined in Section 7.1.1.9 is less than 0.5%, then proceed to Section 7.2.9 if the nonvolatile TCLP is to be performed and to Section 7.3 with a fresh portion of the waste if the volatile TCLP is to be performed.

7.1.2.1 Remove the solid phase and filter from the filtration apparatus.

7.1.2.2 Dry the filter and solid phase at 100 ± 20 °C until two successive weighing yield the same value within ± 1%. Record the final weight.

NOTE: Caution should be taken to ensure that the subject solid will not flash upon heating. It is recommended that the drying oven be vented to a hood or other appropriate device.

7.1.2.3 Calculate the percent dry solids as follows: (Wt. of dry waste +

$$\text{Percent dry solids} = \frac{\text{filter) - tared wt. of filter}}{\text{Initial wt. of waste (Section 7.1.1.5 or 7.1.1.7)}} \times 100$$

7.1.2.4 If the percent dry solids is less than 0.5%, then proceed to Section 7.2.9 if the nonvolatile TCLP is to be performed, and to Section 7.3 if the volatile TCLP is to be performed. If the percent dry solids is greater than or equal to 0.5%, and if the nonvolatile TCLP is to be performed, return to the beginning of this Section (7.1) and, with a fresh portion of waste, determine whether particle size reduction is necessary (Section 7.1.3) and determine the appropriate extraction fluid (Section 7.1.4). If only the volatile TCLP is to be performed, see the note in Section 7.1.4.

7.1.3 Determination of whether the waste requires particle size reduction (particle size is reduced during this step): Using the solid portion of the waste, evaluate the solid for particle size. Particle size reduction is required, unless the solid has a surface area per gram of material equal to or greater than 3.1 cm^2, or is smaller than 1 cm in its narrowest dimension (i.e., is capable of passing through a 9.5 mm (0.375 inch) standard sieve). If the surface area is smaller or the particle size larger than described above, prepare the solid portion of the waste for extraction by crushing, cutting, or grinding the waste to a surface area or particle size as described above. If the solids are prepared for organic volatiles extraction, special precautions must be taken (see Section 7.3.6).

NOTE: Surface area criteria are meant for filamentous (e.g., paper, cloth, and similar) waste materials. Actual measurement of surface area is not required, nor is it recommended. For materials that do not obviously meet the criteria, sample specific methods would need to be developed and employed to measure the surface area. Such methodology is currently not available.

7.1.4 Determination of appropriate extraction fluid: If the solid content of the waste is greater than or equal to 0.5% and if the sample will be extracted for nonvolatile constituents (Section 7.2), determine the appropriate fluid (Section 5.7) for the nonvolatiles extraction as follows:

NOTE: TCLP extraction for volatile constituents uses only extraction fluid #1 (Section 5.7.1). Therefore, if TCLP extraction for nonvolatiles is not required, proceed to Section 7.3.

7.1.4.1 Weigh out a small subsample of the solid phase of the waste, reduce the solid (if necessary) to a particle size of approximately 1 mm in diameter or less, and transfer 5.0 grams of the solid phase of the waste to a 500 mL beaker or Erlenmeyer flask.

7.1.4.2 Add 96.5 mL of reagent water to the beaker, cover with a watchglass, and stir vigorously for 5 minutes using a magnetic stirrer. Measure and record the pH. If the pH is <5.0, use extraction fluid #1. Proceed to Section 7.2.

7.1.4.3 If the pH from Section 7.1.4.2 is >5.0, add 3.5 mL 1N HCl, slurry briefly, cover with a watchglass, heat to 50 °C, and hold at 50 °C for 10 minutes.

7.1.4.4 Let the solution cool to room temperature and record the pH. If the pH is <5.0, use extraction fluid #1. If the pH is >5.0, use extraction fluid #2. Proceed to Section 7.2.

7.1.5 If the aliquot of the waste used for the preliminary evaluation (Sections 7.1.1 - 7.1.4) was determined to be 100% solid at Section 7.1.1.1, then it can be used for the Section 7.2 extraction (assuming at least 100 grams remain), and the Section 7.3 extraction (assuming at least 25 grams remain). If the aliquot was subjected to the procedure in Section 7.1.1.7, then another aliquot shall be used for the volatile extraction procedure in Section 7.3. The aliquot of the waste subjected to the procedure in Section 7.1.1.7 might be appropriate for use for the Section 7.2 extraction if an adequate amount of solid (as determined by Section 7.1.1.9) was obtained. The amount of solid necessary is dependent upon whether a sufficient amount of extract will be produced to support the analyses. If an adequate amount of solid remains, proceed to Section 7.2.10 of the nonvolatile TCLP extraction.

7.2 Procedure When Volatiles are not Involved

A minimum sample size of 100 grams (solid and liquid phases) is recommended. In some cases, a larger sample size may be appropriate, depending on the solids content of the waste sample (percent solids, See Section 7.1.1), whether the initial liquid phase of the waste will be miscible with the aqueous extract of the solid, and whether inorganics, semivolatile organics, pesticides, and herbicides are all analytes of concern. Enough solids should be generated for extraction such that the volume of TCLP extract will be sufficient to support all of the analyses required. If the amount of extract generated by a single TCLP extraction will not be sufficient to perform all of the analyses, more than one extraction may be performed and the extracts from each combined and aliquoted for analysis.

7.2.1 If the waste will obviously yield no liquid when subjected to pressure filtration (i.e., is 100% solid, see Section 7.1.1), weigh out a subsample of the waste (100 gram minimum) and proceed to Section 7.2.9.

7.2.2 If the sample is liquid or multiphasic, liquid/solid separation is required. This involves the filtration device described in Section 4.3.2 and is outlined in Sections 7.2.3 to 7.2.8.

7.2.3 Pre-weigh the container that will receive the filtrate.

7.2.4 Assemble the filter holder and filter following the manufacturer's instructions. Place the filter on the support screen and secure. Acid wash the filter if evaluating the mobility of metals (see Section 4.4).

NOTE: Acid washed filters may be used for all nonvolatile extractions even when metals are not of concern.

7.2.5 Weigh out a subsample of the waste (100 gram minimum) and record the weight. If the waste contains <0.5% dry solids (Section 7.1.2), the liquid portion of the waste, after filtration, is defined as the TCLP extract. Therefore, enough of the sample should be filtered so that the amount of filtered liquid will support all of the analyses required of the TCLP extract. For wastes containing >0.5% dry solids (Sections 7.1.1 or 7.1.2), use the percent solids information obtained in Section 7.1.1 to determine the optimum sample size (100 gram minimum) for filtration. Enough solids should be generated by filtration to support the analyses to be performed on the TCLP extract.

7.2.6 Allow slurries to stand to permit the solid phase to settle. Wastes that settle slowly may be centrifuged prior to filtration. Use centrifugation only as an aid to filtration. If the waste is centrifuged, the liquid should be decanted and filtered followed by filtration of the solid portion of the waste through the same filtration system.

7.2.7 Quantitatively transfer the waste sample (liquid and solid phases) to the filter holder (see Section 4.3.2). Spread the waste sample evenly over the surface of the filter. If filtration of the waste at 4 °C reduces the amount of expressed liquid over what would be expressed at room temperature, then allow the sample to warm up to room temperature in the device before filtering.

NOTE: If waste material (>1% of the original sample weight) has obviously adhered to the container used to transfer the sample to the filtration apparatus, determine the weight of this residue and subtract it from the sample weight determined in Section 7.2.5, to determine the weight of the waste sample that will be filtered.

Gradually apply vacuum or gentle pressure of 1-10 psi, until air or pressurizing gas moves through the filter. If this point is not reached under 10 psi, and if no additional liquid has passed through the filter in any 2 minute interval, slowly increase the pressure in 10 psi increments to a maximum of 50 psi. After each incremental increase of 10 psi, if the pressurizing gas has not moved through the filter, and if no additional liquid has passed through the filter in any 2 minute interval, proceed to the next 10 psi increment. When the pressurizing gas begins to move through the filter, or when the liquid flow has ceased at 50 psi (i.e., filtration does not result in any additional filtrate within a 2 minute period), stop the filtration.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.2.8 The material in the filter holder is defined as the solid phase of the waste, and the filtrate is defined as the liquid phase. Weigh the filtrate. The liquid phase may now be either analyzed (See Section 7.2.12) or stored at 4 °C until time of analysis.

NOTE: Some wastes, such as oily wastes and some paint wastes, will obviously contain some material that appears to be a liquid. Even after applying vacuum or pressure filtration, as outlined in Section 7.2.7, this material may not filter. If this is the case, the material within the filtration device is defined as a solid and is carried through the extraction as a solid. Do not replace the original filter with a fresh filter under any circumstances. Use only one filter.

7.2.9 If the waste contains <0.5% dry solids (see Section 7.1.2), proceed to Section 7.2.13. If the waste contains >0.5% dry solids (see Section 7.1.1 or 7.1.2), and if particle size reduction of the solid was needed in Section 7.1.3, proceed to Section 7.2.10. If the waste as received passes a 9.5 mm sieve, quantitatively transfer the solid material into the extractor bottle along with the filter used to separate the initial liquid from the solid phase, and proceed to Section 7.2.11.

7.2.10 Prepare the solid portion of the waste for extraction by crushing, cutting, or grinding the waste to a surface area or particle size as described in Section 7.1.3. When the surface area or particle size has been appropriately altered, quantitatively transfer the solid material into an extractor bottle. Include the filter used to separate the initial liquid from the solid phase.

NOTE: Sieving of the waste is not normally required. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended. If sieving is necessary, a Teflon coated sieve should be used to avoid contamination of the sample.

7.2.11 Determine the amount of extraction fluid to add to the extractor vessel as follows:

$$\text{Weight of extraction fluid} = \frac{20 \text{ x percent solids (Section 7.1.1) x weight of waste filtered (Section 7.2.5 or 7.2.7)}}{100}$$

Slowly add this amount of appropriate extraction fluid (see Section 7.1.4) to the extractor vessel. Close the extractor bottle tightly (it is recommended that Teflon tape be used to ensure a tight seal), secure in rotary agitation device, and rotate at 30 ± 2 rpm for 18 ± 2 hours. Ambient temperature (i.e., temperature of room in which extraction takes place) shall be maintained at 23 ± 2 °C during the extraction period.

NOTE: As agitation continues, pressure may build up within the extractor bottle for some types of wastes (e.g., limed or calcium carbonate containing waste may evolve gases such as carbon dioxide). To relieve excess pressure, the extractor bottle may be periodically opened (e.g., after 15 minutes, 30 minutes, and 1 hour) and vented into a hood.

7.2.12 Following the 18 ± 2 hour extraction, separate the material in the extractor vessel into its component liquid and solid phases by filtering through a new glass fiber filter, as outlined in Section 7.2.7. For final filtration of the TCLP extract, the glass fiber filter may be changed, if necessary, to facilitate filtration. Filter(s) shall be acid-washed (see Section 4.4) if evaluating the mobility of metals.

7.2.13 Prepare the TCLP extract as follows:

7.2.13.1 If the waste contained no initial liquid phase, the filtered liquid material obtained from Section 7.2.12 is defined as the TCLP extract. Proceed to Section 7.2.14.

7.2.13.2 If compatible (e.g., multiple phases will not result on combination), combine the filtered liquid resulting from Section 7.2.12 with the initial liquid phase of the waste obtained in Section 7.2.7. This combined liquid is defined as the TCLP extract. Proceed to Section 7.2.14.

7.2.13.3 If the initial liquid phase of the waste, as obtained from Section 7.2.7, is not or may not be compatible with the filtered liquid resulting from Section 7.2.12, do not combine these liquids. Analyze these liquids, collectively defined as the TCLP extract, and combine the results mathematically, as described in Section 7.2.14.

7.2.14 Following collection of the TCLP extract, the pH of the extract should be recorded. Immediately aliquot and preserve the extract for analysis. Metals aliquots must be acidified with nitric acid to pH <2. If precipitation is observed upon addition of nitric acid to a small aliquot of the extract, then the remaining portion of the extract for metals analyses shall not be acidified and the extract shall be analyzed as soon as possible. All other aliquots must be stored under refrigeration (4 °C) until analyzed. The TCLP extract shall be prepared and analyzed according to appropriate analytical methods. TCLP extracts to be analyzed for metals shall be acid digested except in those instances where digestion causes loss of metallic analytes. If an analysis of the undigested extract shows that the concentration of any regulated metallic analyte exceeds the regulatory level, then the waste is hazardous and digestion of the extract is not necessary. However, data on undigested extracts alone cannot be used to demonstrate that the waste is not hazardous. If the individual phases are to be analyzed separately, determine the volume of the individual phases (to $\underline{+}$ 0.5%), conduct the appropriate analyses, and combine the results mathematically by using a simple volume-weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)(C_1) + (V_2)(C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phase (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.2.15 Compare the analyte concentrations in the TCLP extract with the levels identified in the appropriate regulations. Refer to Section 8.0 for quality assurance requirements.

7.3 Procedure When Volatiles are Involved

Use the ZHE device to obtain TCLP extract for analysis of volatile compounds only. Extract resulting from the use of the ZHE shall not be used to evaluate the mobility of nonvolatile analytes (e.g., metals, pesticides, etc.).

The ZHE device has approximately a 500 mL internal capacity. The ZHE can thus accommodate a maximum of 25 grams of solid (defined as that fraction of a sample from which no additional liquid may be forced out by an applied pressure of 50 psi), due to the need to add an amount of extraction fluid equal to 20 times the weight of the solid phase.

Charge the ZHE with sample only once and do not open the device until the final extract (of the solid) has been collected. Repeated filling of the ZHE to obtain 25 grams of solid is not permitted.

Do not allow the waste, the initial liquid phase, or the extract to be exposed to the atmosphere for any more time than is absolutely necessary. Any manipulation of these materials should be done when cold (4 °C) to minimize loss of volatiles.

7.3.1 Pre-weigh the (evacuated) filtrate collection container (See Section 4.6) and set aside. If using a TEDLAR® bag, express all liquid from the ZHE device into the bag, whether for the initial or final liquid/solid separation, and take an aliquot from the liquid in the bag for analysis. The containers listed in Section 4.6 are recommended for use under the conditions stated in Sections 4.6.1 - 4.6.3.

7.3.2 Place the ZHE piston within the body of the ZHE (it may be helpful first to moisten the piston O-rings slightly with extraction fluid). Adjust the piston within the ZHE body to a height that will minimize the distance the piston will have to move once the ZHE is charged with sample (based upon sample size requirements determined from Section 7.3, Section 7.1.1 and/or 7.1.2). Secure the gas inlet/outlet flange (bottom flange) onto the ZHE body in accordance with the manufacturer's instructions. Secure the glass fiber filter between the support screens and set aside. Set liquid inlet/outlet flange (top flange) aside.

7.3.3 If the waste is 100% solid (see Section 7.1.1), weigh out a subsample (25 gram maximum) of the waste, record weight, and proceed to Section 7.3.5.

7.3.4 If the waste contains < 0.5% dry solids (Section 7.1.2), the liquid portion of waste, after filtration, is defined as the TCLP extract. Filter enough of the sample so that the amount of filtered liquid will support all of the volatile analyses required. For wastes containing $\geq$ 0.5% dry solids (Sections 7.1.1 and/or 7.1.2), use the percent solids information obtained in Section 7.1.1 to determine the optimum sample size to charge into the ZHE. The recommended sample size is as follows:

7.3.4.1 For wastes containing < 5% solids (see Section 7.1.1), weigh out a 500 gram subsample of waste and record the weight.

7.3.4.2 For wastes containing $\geq$ 5% solids (see Section 7.1.1), determine the amount of waste to charge into the ZHE as follows:

$$\text{Weight of waste to charge ZHE} = \frac{25}{\text{percent solids (Section 7.1.1)}} \times 100$$

Weigh out a subsample of the waste of the appropriate size and record the weight.

7.3.5 If particle size reduction of the solid portion of the waste was required in Section 7.1.3, proceed to Section 7.3.6. If particle size reduction was not required in Section 7.1.3, proceed to Section 7.3.7.

7.3.6 Prepare the waste for extraction by crushing, cutting, or grinding the solid portion of the waste to a surface area or particle size as described in Section 7.1.3. Wastes and appropriate reduction equipment should be refrigerated, if possible, to 4 °C prior to particle size reduction. The means used to effect particle size reduction must not generate heat in and of itself. If reduction of the solid phase of the waste is necessary, exposure of the waste to the atmosphere should be avoided to the extent possible.

NOTE: Sieving of the waste is not recommended due to the possibility that volatiles may be lost. The use of an appropriately graduated ruler is recommended as an acceptable alternative. Surface area requirements are meant for filamentous (e.g., paper, cloth) and similar waste materials. Actual measurement of surface area is not recommended.

When the surface area or particle size has been appropriately altered, proceed to Section 7.3.7.

7.3.7 Waste slurries need not be allowed to stand to permit the solid phase to settle. Do not centrifuge wastes prior to filtration.

7.3.8 Quantitatively transfer the entire sample (liquid and solid phases) quickly to the ZHE. Secure the filter and support screens onto the top flange of the device and secure the top flange to the ZHE body in accordance with the manufacturer's instructions. Tighten all ZHE fittings and place the device in the vertical position (gas inlet/outlet flange on the bottom). Do not attach the extract collection device to the top plate.

NOTE: If waste material (>1% of original sample weight) has obviously adhered to the container used to transfer the sample to the ZHE, determine the weight of this residue and subtract it from the sample weight determined in Section 7.3.4 to determine the weight of the waste sample that will be filtered.

Attach a gas line to the gas inlet/outlet valve (bottom flange) and, with the liquid inlet/outlet valve (top flange) open, begin applying gentle pressure of 1-10 psi (or more if necessary) to force all headspace slowly out of the ZHE device into a hood. At the first appearance of liquid from the liquid inlet/outlet valve, quickly close the valve and discontinue pressure. If filtration of the waste at 4 °C reduces the amount of expressed liquid over what would be expressed at room tempera- ture, then allow the sample to warm up to room temperature in the device before filtering. If the waste is 100% solid (see Section 7.1.1), slowly increase the pressure to a maximum of 50 psi to force most of the headspace out of the device and proceed to Section 7.3.12.

7.3.9 Attach the evacuated pre-weighed filtrate collection container to the liquid inlet/outlet valve and open the valve. Begin applying gentle pressure of 1-10 psi to force the liquid phase of the sample into the filtrate collection container. If no additional liquid has passed through the filter in any 2 minute interval, slowly increase the pressure in 10 psi increments to a maximum of 50 psi. After each incremental increase of 10 psi, if no additional liquid has passed through the filter in any 2 minute interval, proceed to the next 10 psi increment. When liquid flow has ceased such that continued pressure filtration at 50 psi does not result in any additional filtrate within a 2 minute period, stop the filtration. Close the liquid inlet/outlet valve, discontinue pressure to the piston, and disconnect and weigh the filtrate collection container.

NOTE: Instantaneous application of high pressure can degrade the glass fiber filter and may cause premature plugging.

7.3.10 The material in the ZHE is defined as the solid phase of the waste and the filtrate is defined as the liquid phase.

NOTE: Some wastes, such as oily wastes and some paint wastes, will obviously contain some material that appears to be a liquid. Even after applying pressure filtration, this material will not filter. If this is the case, the material within the filtration device is defined as a solid and is carried through the TCLP extraction as a solid.

If the original waste contained <0.5% dry solids (see Section 7.1.2), this filtrate is defined as the TCLP extract and is analyzed directly. Proceed to Section 7.3.15.

7.3.11 The liquid phase may now be either analyzed immediately (See Sections 7.3.13 through 7.3.15) or stored at 4 °C under minimal headspace conditions until time of analysis. Determine the weight of extraction fluid #1 to add to the ZHE as follows:

$$\text{Weight of extraction fluid} = \frac{\text{20 x percent solids (Section 7.1.1) x weight of waste filtered (Section 7.3.4 or 7.3.8)}}{100}$$

7.3.12 The following Sections detail how to add the appropriate amount of extraction fluid to the solid material within the ZHE and agitation of the ZHE vessel. Extraction fluid #1 is used in all cases (See Section 5.7).

7.3.12.1 With the ZHE in the vertical position, attach a line from the extraction fluid reservoir to the liquid inlet/outlet valve. The line used shall contain fresh extraction fluid and should be preflushed with fluid to eliminate any air pockets in the line. Release gas pressure on the ZHE piston (from the gas inlet/outlet valve), open the liquid inlet/outlet valve, and begin transferring extraction fluid (by pumping or similar means) into the ZHE. Continue pumping extraction fluid into the ZHE until the appropriate amount of fluid has been introduced into the device.

7.3.12.2 After the extraction fluid has been added, immediately close the liquid inlet/outlet valve and disconnect the extraction fluid line. Check the ZHE to ensure that all valves are in their closed positions. Manually rotate the device in an end-over-end fashion 2 or 3 times. Reposition the ZHE in the vertical position with the liquid inlet/outlet valve on top. Pressurize the ZHE to 5-10 psi (if necessary) and slowly open the liquid inlet/outlet valve to bleed out any headspace (into a hood) that may have been introduced due to the addition of extraction fluid. This bleeding shall be done quickly and shall be stopped at the first appearance of liquid from the valve. Re-pressurize the ZHE with 5-10 psi and check all ZHE fittings to ensure that they are closed.

7.3.12.3 Place the ZHE in the rotary agitation apparatus (if it is not already there) and rotate at 30 ± 2 rpm for 18 ± 2 hours. Ambient temperature (i.e., temperature of room in which extraction occurs) shall be maintained at 23 ± 2 °C during agitation.

7.3.13 Following the 18 ± 2 hour agitation period, check the pressure behind the ZHE piston by quickly opening and closing the gas inlet/outlet valve and noting the escape of gas. If the pressure has not been maintained (i.e., no gas release observed), the device is leaking. Check the ZHE for leaking as specified in Section 4.2.1, and perform the extraction again with a new sample of waste. If the pressure within the device has been maintained, the material in the extractor vessel is once again separated into its component liquid and solid phases. If the waste contained an initial liquid phase, the liquid may be filtered directly into the same filtrate collection container (i.e., TEDLAR® bag) holding the initial liquid phase of the waste. A separate filtrate collection container must be used if combining would create multiple phases, or there is not enough volume left within the filtrate collection container. Filter through the glass fiber filter, using the ZHE device as discussed in Section 7.3.9. All extract shall be filtered and collected if the

TEDLAR® bag is used, if the extract is multiphasic, or if the waste contained an initial liquid phase (see Sections 4.6 and 7.3.1).

NOTE: An in-line glass fiber filter may be used to filter the material within the ZHE if it is suspected that the glass fiber filter has been ruptured.

7.3.14 If the original waste contained no initial liquid phase, the filtered liquid material obtained from Section 7.3.13 is defined as the TCLP extract. If the waste contained an initial liquid phase, the filtered liquid material obtained from Section 7.3.13 and the initial liquid phase (Section 7.3.9) are collectively defined as the TCLP extract.

7.3.15 Following collection of the TCLP extract, immediately prepare the extract for analysis and store with minimal headspace at 4 °C until analyzed. Analyze the TCLP extract according to the appropriate analytical methods. If the individual phases are to be analyzed separately (<u>i.e.,</u> are not miscible), determine the volume of the individual phases (to 0.5%), conduct the appropriate analyses, and combine the results mathematically by using a simple volume-weighted average:

$$\text{Final Analyte Concentration} = \frac{(V_1)\,(C_1) + (V_2)\,(C_2)}{V_1 + V_2}$$

where:

V_1 = The volume of the first phases (L).
C_1 = The concentration of the analyte of concern in the first phase (mg/L).
V_2 = The volume of the second phase (L).
C_2 = The concentration of the analyte of concern in the second phase (mg/L).

7.3.16 Compare the analyte concentrations in the TCLP extract with the levels identified in the appropriate regulations. Refer to Section 8.0 for quality assurance requirements.

8.1 QUALITY ASSURANCE

8.2 A minimum of one blank (using the same extraction fluid as used for the samples) must be analyzed for every 20 extractions that have been conducted in an extraction vessel.

8.3 A matrix spike shall be performed for each waste type (<u>e.g.,</u> wastewater treatment sludge, contaminated soil, etc.) unless the result exceeds the regulatory level and the data are being used solely to demonstrate that the waste property exceeds the regulatory level. A minimum of one matrix spike must be analyzed for each analytical batch. As a minimum, follow the matrix spike addition guidance provided in each analytical method.

8.3.1 Matrix spikes are to be added after filtration of the TCLP extract and before preservation. Matrix spikes should not be added prior to TCLP extraction of the sample.

8.3.2 In most cases, matrix spikes should be added at a concentration equivalent to the corresponding regulatory level. If the analyte concentration is less than one half the regulatory level, the spike concentration may be as low as one half of the analyte concentra- tion, but may not be not less than five times the method detection limit. In order to avoid differences in matrix effects, the matrix spikes must be added to the same nominal volume of TCLP extract as that which was analyzed for the unspiked sample.

8.3.3 The purpose of the matrix spike is to monitor the performance of the analytical methods used, and to determine whether matrix interferences exist. Use of other internal calibration methods, modification of the analytical methods, or use of alternate analytical methods may be needed to accurately measure the analyte concentration in the TCLP extract when the recovery of the matrix spike is below the expected analytical method performance.

8.3.4 Matrix spike recoveries are calculated by the following formula:

$$\%R\ (\%Recovery) = 100\ (X_s - X_u)/K$$

where:
X_s = measured value for the spiked sample,
X_u = measured value for the unspiked sample, and
K = known value of the spike in the sample.

8.4 All quality control measures described in the appropriate analytical methods shall be followed.

8.5 The use of internal calibration quantitation methods shall be employed for a metallic contaminant if: (1) Recovery of the contaminant from the TCLP extract is not at least 50% and the concentration does not exceed the regulatory level, and (2) The concentration of the contaminant measured in the extract is within 20% of the appropriate regulatory level.

8.4.1. The method of standard additions shall be employed as the internal calibration quantitation method for each metallic contaminant.

8.4.2 The method of standard additions requires preparing calibration standards in the sample matrix rather than reagent water or blank solution. It requires taking four identical aliquots of the solution and adding known amounts of standard to three of these aliquots. The forth aliquot is the unknown. Preferably, the first addition should be prepared so that the resulting concentration is approximately 50% of the expected concentration of the sample. The second and third additions should be prepared so that the concentrations are approximately 100% and

150% of the expected concentration of the sample. All four aliquots are maintained at the same final volume by adding reagent water or a blank solution, and may need dilution adjustment to maintain the signals in the linear range of the instrument technique. All four aliquots are analyzed.

8.4.3 Prepare a plot, or subject data to linear regression, of instrument signals or external-calibration-derived concentrations as the dependant variable (y-axis) versus concentrations of the additions of standard as the independent variable (x-axis). Solve for the intercept of the abscissa (the independent variable, x-axis) which is the concentration in the unknown.

8.4.4 Alternately, subtract the instrumental signal or external- calibration-derived concentration of the unknown (unspiked) sample from the instrumental signals or external-calibration-derived concentrations of the standard additions. Plot or subject to linear regression of the corrected instrument signals or external-calibration-derived concentra- tions as the dependant variable versus the independent variable. Derive concentrations for unknowns using the internal calibration curve as if it were an external calibration curve.

8.5 Samples must undergo TCLP extraction within the following time periods:

SAMPLE MAXIMUM HOLDING TIMES [DAYS]

	From: Field collection To: TCLP extraction	From: TCLP extraction To: Preparative extraction	From: Preparative extraction To: Determinative analysis	Total elapsed time
Volatiles	14	NA	14	28
Semi-volatiles	14	7	40	61
Mercury	28	NA	28	56
Metals, except mercury	180	NA	180	360

NA = Not applicable

If sample holding times are exceeded, the values obtained will be considered minimal concentrations. Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory level.

9.1 METHOD PERFORMANCE

9.2 Ruggedness. Two ruggedness studies have been performed to determine the effect of various perturbations on specific elements of the TCLP protocol. Ruggedness testing determines the sensitivity of small procedural variations which might be expected to occur during routine laboratory application.

9.2.1 Metals - The following conditions were used when leaching a waste for metals analysis:

Varying Conditions	
Liquid/Solid ratio	19:1 vs. 21:1
Extraction time	16 hours vs. 18 hours
Headspace	20% vs. 60%
Buffer #2 acidity	190 meq vs. 210 meq
Acid-washed filters	yes vs. no
Filter type	0.7 µm glass fiber vs. 0.45 µm vs. polycarbonate
Bottle type	borosilicate vs. flint glass

Of the seven method variations examined, acidity of the extraction fluid had the greatest impact on the results. Four of 13 metals from an API separator sludge/electroplating waste (API/EW) mixture and two of three metals from an ammonia lime still bottom waste were extracted at higher levels by the more acidic buffer. Because of the sensitivity to pH changes, the method requires that the extraction fluids be prepared so that the final pH is within ±0.05 units as specified.

9.2.2 Volatile Organic Compounds - The following conditions were used when leaching a waste for VOC analysis:

Varying Conditions	
Liquid/Solid ratio	19:1 vs. 21:1
Headspace	0% vs. 5%
Buffer #1 acidity	60 meq vs. 80 meq
Method of storing extract	Syringe vs. Tedlar® bag
Aliquotting	yes vs. no
Pressure behind piston	0 psi vs. 20 psi

None of the parameters had a significant effect on the results of the ruggedness test.

9.3 Precision. Many TCLP precision (reproducibility) studies have been performed, and have shown that, in general, the precision of the TCLP is comparable to or exceeds that of the EP toxicity test and that method precision is adequate. One of the more significant contributions to poor precision appears to be related to sample homogeneity and inter-laboratory variation (due to the nature of waste materials).

9.3.1 Metals - The results of a multi-laboratory study are shown in Table 6, and indicate that a single analysis of a waste may not be adequate for waste characterization and identification requirements.

9.3.2 Semi-Volatile Organic Compounds - The results of two studies are shown in Tables 7 and 8. Single laboratory precision was excellent with greater than 90 percent of the results exhibiting an RSD less than 25 percent. Over 85 percent of all individual compounds in the multi-laboratory study fell in the RSD range of 20 - 120 percent. Both studies concluded that the TCLP provides adequate precision. It was also determined that the high acetate content of the extraction fluid did not present problems (i.e., column degradation of the gas chromatograph) for the analytical conditions used.

9.3.3 Volatile Organic Compounds - Eleven laboratories participated in a collaborative study of the use of the ZHE with two waste types which were fortified with a mixture of VOCs. The results of the collaborative study are shown in Table 9. Precision results for VOCs tend to occur over a considerable range. However, the range and mean RSD compared very closely to the same collaborative study metals results in Table 6. Blackburn and Show concluded that at the 95% level of signifi- cance: 1) recoveries among laboratories were statistically similar, 2) recoveries did not vary significantly between the two sample types, and 3) each laboratory showed the same pattern of recovery for each of the two samples.

10.0 REFERENCES

1. Blackburn, W.B. and Show, I. "Collaborative Study of the Toxicity Characteristics Leaching Procedure (TCLP)." Draft Final Report, Contract No. 68- 03-1958, S-Cubed, November 1986.

2. Newcomer, L.R., Blackburn, W.B., Kimmell, T.A. "Performance of the Toxicity Characteristic Leaching Procedure." Wilson Laboratories, S-Cubed, U.S. EPA, December 1986.

3. Williams, L.R., Francis, C.W.; Maskarinec, M.P., Taylor D.R., and Rothman,
N. "Single-Laboratory Evaluation of Mobility Procedure for Solid Waste." EMSL, ORNL, S-Cubed, ENSECO.

Table 1.
Volatile Analytes[1,2]

Compound	CAS No.
Acetone	67-64-1
Benzene	71-43-2
n-Butyl alcohol	71-36-3
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroform	67-66-3
1,2-Dichloroethane	107-06-2
1,1-Dichloroethylene	75-35-4
Ethyl acetate	141-78-6
Ethyl benzene	100-41-4
Ethyl ether	60-29-7
Isobutanol	78-83-1
Methanol	67-56-1
Methylene chloride	75-09-2
Methyl ethyl ketone	78-93-3
Methyl isobutyl ketone	108-10-1
Tetrachloroethylene	127-18-4
Toluene	108-88-3
1,1,1,-Trichloroethane	71-55-6
Trichloroethylene	79-01-6
Trichlorofluoromethane	75-69-4
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1
Vinyl chloride	75-01-4
Xylene	1330-20-7

[1] When testing for any or all of these analytes, the zero-headspace extractor vessel shall be used instead of the bottle extractor.

[2] Benzene, carbon tetrachloride, chlorobenzene, chloroform, 1,2-dichloroethane, 1,1-dichloroethylene, methyl ethyl ketone, tetrachloroethylene, and vinyl chloride are toxicity characteristic constituents.

Table 2.
Suitable Rotary Agitation Apparatus[1]

Company	Location	Model No.
Analytical Testing and Services,	Warrington, PA (215) 343-4490	4-vessel extractor (DC20S) Consulting 8-vessel extractor (DC20) Inc. 12-vessel extractor (DC20B) 24-vessel extractor (DC24C)
Associated Design and Manufacturing Company	Alexandria, VA (703) 549-5999	2-vessel (3740-2-BRE) 4-vessel (3740-4-BRE) 6-vessel (3740-6-BRE) 8- vessel (3740-8-BRE) 12-vessel (3740-12-BRE) 24-vessel (3740-24-BRE)
Environmental Machine and Inc.	Lynchburg, VA (804) 845-6424	8-vessel (08-00-00) Design, 4-vessel (04-00-00)
IRA Machine Shop and Laboratory	Santurce, PR (809) 752-4004	8-vessel (011001)
Lars Lande Manufacturing	Whitmore Lake, MI (313) 449-4116	10-vessel (10VRE) 5-vessel (5VRE) 6-vessel (6VRE)
Millipore Corp.	Bedford, MA (800) 225-3384	4-ZHE or 4 2-liter bottle extractor (YT31ORAHW)

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[1] Any device that rotates the extraction vessel in an end-over-end fashion at 30 ± 2 rpm is acceptable.

Table 3.
Suitable Zero-Headspace Extractor Vessels[1]

Company	Location	Model No.
Analytical Testing & Consulting Services, Inc.	Warrington, PA (215) 343-4490	C1O2, Mechanical Pressure Device
Associated Design and Manufacturing Company	Alexandria, VA (703) 549-5999	3745-ZHE, Gas Pressure Device
Lars Lande Manufacturing[2]	Whitmore Lake, MI (313) 449-4116	ZHE-11, Gas Pressure Device
Millipore Corporation	Bedford, MA (800) 225-3384	YT30O9OHW, Gas Pressure Device
Environmental Machine and Design, Inc.	Lynchburg, VA (804) 845-6424	VOLA-TOX1, Gas Pressure Device
Gelman Science	Ann Arbor, MI 521-1520	15400 Gas Pressure (800) Device

[1] Any device that meets the specifications listed in Section 4.2.1 of the method is suitable.

[2] This device uses a 110 mm filter.

Table 4.
Suitable Filter Holders[1]

Company	Location	Model/ Catalogue No.	Size
Nucleopore Corporation	Pleasanton, CA	425910	142 mm
	(800) 882-7711	410400	47 mm
Micro Filtration Systems	Dublin, CA	302400	142 mm
	(800) 334-7132	311400	47 mm
	(415) 828-6010		
Millipore Corporation	Bedford, MA (800)	YT30142HW	142 mm
	225-3384	XX1004700	47 mm

[1] Any device capable of separating the liquid from the solid phase of the waste is suitable, providing that it is chemically compatible with the waste and the constituents to be analyzed. Plastic devices (not listed above) may be used when only inorganic analytes are of concern. The 142 mm size filter holder is recommended.

Table 5.
Suitable Filter Media[1]

Company	Location	Model	Pore Size (µm)
Millipore Corporation	Bedford, MA (800) 225-3384	AP40	0.7
Nucleopore Corporation	Pleasanton, CA (415) 463-2530	211625	0.7
Whatman Laboratory Products, Inc.	Clifton, NJ (201) 773-5800	GFF	0.7
Micro Filtration Systems	Dublin, CA (800) 334-7132 (415) 828-6010	GF75	0.7
Gelman Science	Ann Arbor, MI (800) 521-1520	66256 (90mm) 66257 (142mm)	0.7

[1] Any filter that meets the specifications in Section 4.4 of the Method is suitable.

Table 6. Multi-Laboratory TCLP Metals, Precision

Waste	Extraction Fluid	Metal	$\bar{X}$	S	%RSD
Ammonia Lime Still Bottoms	#1	Cadmium	0.053	0.031	60
	#2		0.023	0.017	76
	#1	Chromium	0.015	0.0014	93
	#2		0.0032	0.0037	118
	#1	Lead	0.0030	0.0027	90
	#2		0.0032	0.0028	87
API/EW Mixture	#1	Cadmium	0.0046	0.0028	61
	#2		0.0005	0.0004	77
	#1	Chromium	0.0561	0.0227	40
	#2		0.105	0.018	17
	#1	Lead	0.0031	0.0031	100
	#2		0.0124	0.0136	110
Fossil Fuel Fly Ash	#1	Cadmium	0.080	0.069	86
	#2		0.093	0.067	72
	#1	Chromium	0.017	0.014	85
	#2		0.070	0.040	57
	#1	Lead	0.0087	0.0074	85
	#2		0.0457	0.0083	18

%RSD Range = 17 - 118 Mean
%RSD = 74

NOTE: $\bar{X}$ = Mean results from 6 - 12 different laboratories Units = mg/L
Extraction Fluid #1 = pH 4.9
#2 = pH 2.9

Table 7. Single-Laboratory Semi-Volatiles, Precision

Waste	Compound	Extraction Fluid	$\bar{X}$	S	%RSD
Ammonia Lime Still Bottoms	Phenol	#1	19000	2230	11.6
		#2	19400	929	4.8
	2-Methylphenol	#1	2000	297	14.9
		#2	1860	52.9	2.8
	4-Methylphenol	#1	7940	1380	17.4
		#2	7490	200	2.7
	2,4-Dimethylphenol	#1	321	46.8	14.6
		#2	307	45.8	14.9
	Naphthalene	#1	3920	413	10.5
		#2	3827	176	4.6
	2-Methylnaphthalene	#1	290	44.8	15.5
		#2	273	19.3	7.1
	Dibenzofuran	#1	187	22.7	12.1
		#2	187	7.2	3.9
	Acenaphthylene	#1	703	89.2	12.7
		#2	663	20.1	3.0
	Fluorene	#1	151	17.6	11.7
		#2	156	2.1	1.3
	Phenanthrene	#1	241	22.7	9.4
		#2	243	7.9	3.3
	Anthracene	#1	33.2	6.19	18.6
		#2	34.6	1.55	4.5
	Fluoranthrene	#1	25.3	1.8	7.1
		#2	26.0	1.8	7.1
API/EW Mixture	Phenol	#1	40.7	13.5	33.0
		#2	19.0	1.76	9.3
	2,4-Dimethylphenol	#1	33.0	9.35	28.3
		#2	43.3	8.61	19.9
	Naphthalene	#1	185	29.4	15.8
		#2	165	24.8	15.0
	2-Methylnaphthalene	#1	265	61.2	23.1
		#2	200	18.9	9.5

%RSD Range = 1 - 33
Mean %RSD = 12

NOTE: Units = µg/L
Extractions were performed in triplicate
All results were at least 2x the detection limit Extraction Fluid #1 = pH 4.9
#2 = pH 2.9

Table 8. Multi-Laboratory Semi-Volatiles, Precision

Waste	Compound	Extraction Fluid	$\overline{X}$	S	%RSD
Ammonia Lime	BNAs	#1	10043	7680	76.5
Still Bottoms (A)		#2	10376	6552	63.1
API/EW	BNAs	#1	1624	675	41.6
Mixture (B)		#2	2074	1463	70.5
Fossil Fuel	BNAs	#1	750	175	23.4
Fly Ash (C)		#2	739	342	46.3
Mean %RSD = 54					

NOTE: Units = µg/L

X = Mean results from 3 - 10 labs Extraction Fluid #1 = pH 4.9

#2 = pH 2.9

%RSD Range for Individual Compounds

A, #1	0 - 113
A, #2	28 - 108
B, #1	20 - 156
B, #2	49 - 128
C, #1	36 - 143
C, #2	61 - 164

Table 9. Multi-Laboratory (11 Labs) VOCs, Precision

Waste	Compound	$\bar{X}$	S	%RSD
Mine Tailings	Vinyl chloride	6.36	6.36	100
	Methylene chloride	12.1	11.8	98
	Carbon disulfide	5.57	2.83	51
	1,1-Dichloroethene	21.9	27.7	127
	1,1-Dichloroethane	31.4	25.4	81
	Chloroform	46.6	29.2	63
	1,2-Dichloroethane	47.8	33.6	70
	2-Butanone	43.5	36.9	85
	1,1,1-Trichloroethane	20.9	20.9	100
	Carbon tetrachloride	12.0	8.2	68
	Trichloroethene	24.7	21.2	86
	1,1,2-Trichloroethene	19.6	10.9	56
	Benzene	37.9	28.7	76
	1,1,2,2-Tetrachloroethane	34.9	25.6	73
	Toluene	29.3	11.2	38
	Chlorobenzene	35.6	19.3	54
	Ethylbenzene	4.27	2.80	66
	Trichlorofluoromethane	3.82	4.40	115
	Acrylonitrile	76.7	110.8	144
Ammonia Lime Still Bottoms	Vinyl chloride	5.00	4.71	94
	Methylene chloride	14.3	13.1	92
	Carbon disulfide	3.37	2.07	61
	1,1-Dichloroethene	52.1	38.8	75
	1,1-Dichloroethane	52.8	25.6	49
	Chloroform	64.7	28.4	44
	1,2-Dichloroethane	43.1	31.5	73
	2-Butanone	59.0	39.6	67
	1,1,1-Trichloroethane	53.6	40.9	76
	Carbon tetrachloride	7.10	6.1	86
	Trichloroethene	57.3	34.2	60
	1,1,2-Trichloroethene	6.7	4.7	70
	Benzene	61.3	26.8	44
	1,1,2,2-Tetrachloroethane	3.16	2.1	66
	Toluene	69.0	18.5	27
	Chlorobenzene	71.8	12.0	17
	Ethylbenzene	3.70	2.2	58
	Trichlorofluoromethane	4.05	4.8	119
	Acrylonitrile	29.4	34.8	118
			%RSD Range = 17 - 144 Mean %RSD = 75	

NOTE: Units = µg/L

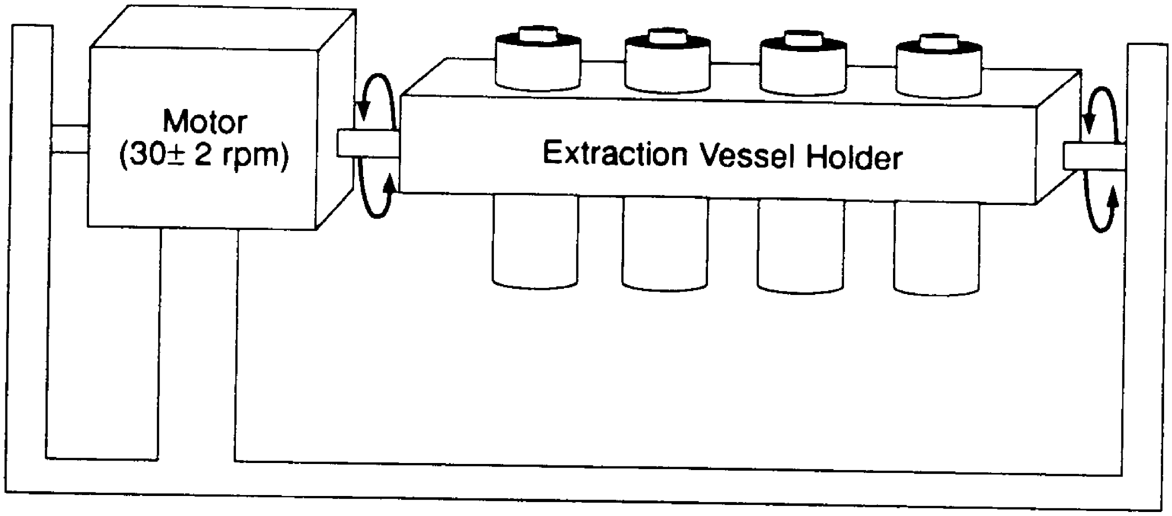


Figure 1. Rotary Agitation Apparatus

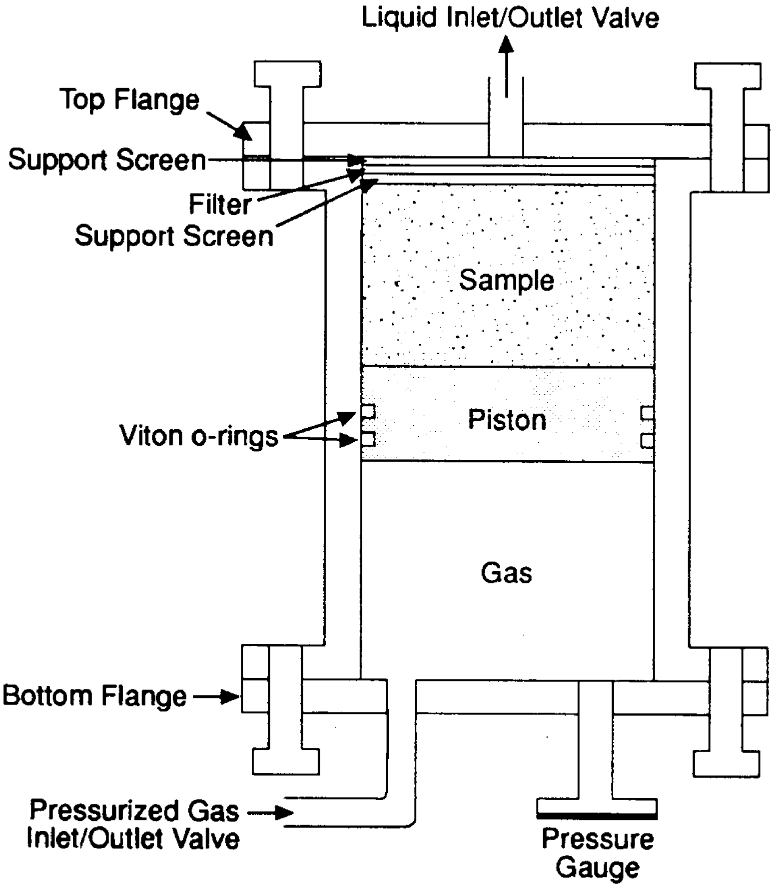
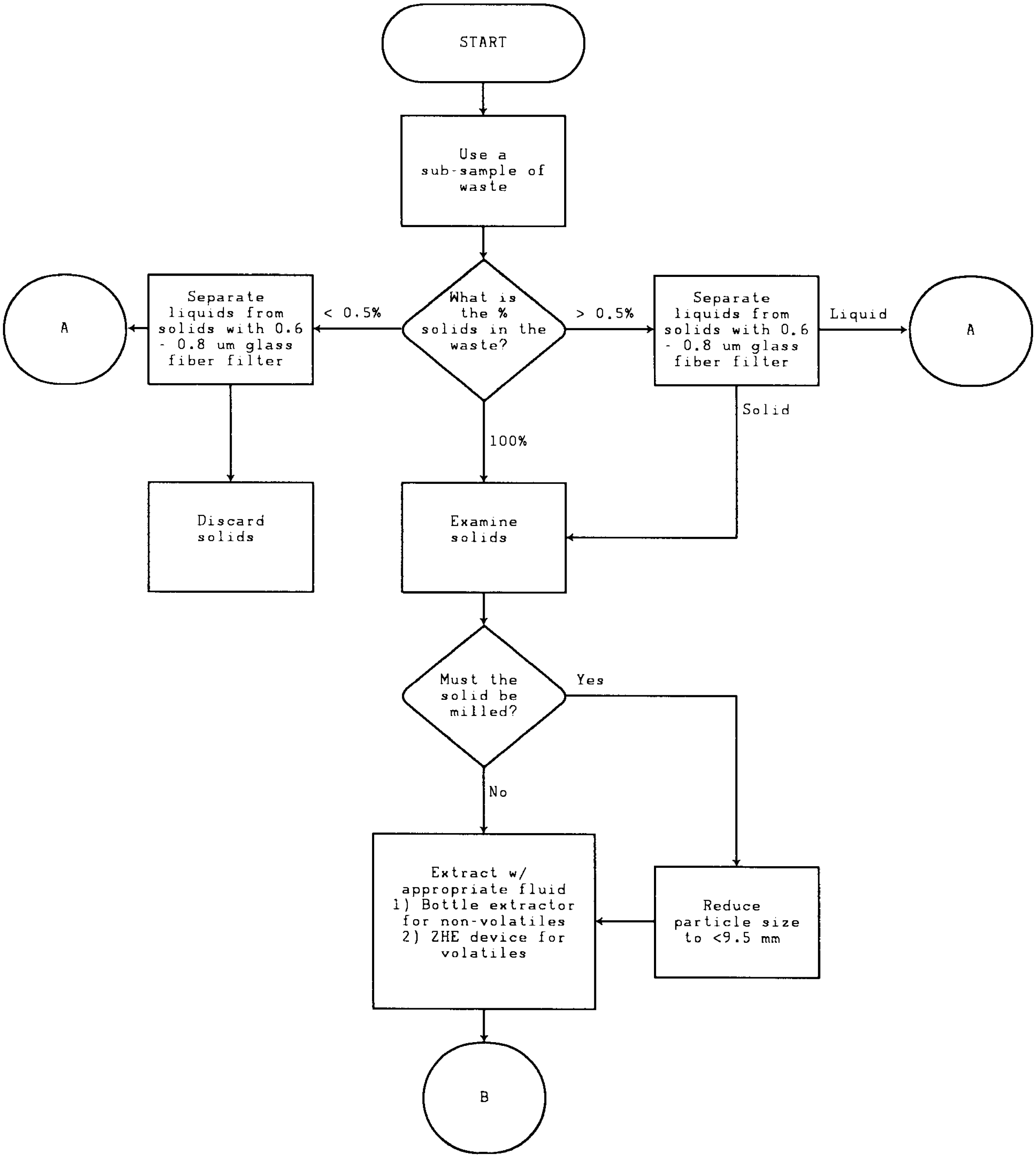


Figure 2. Zero-Headspace Extractor (ZHE)

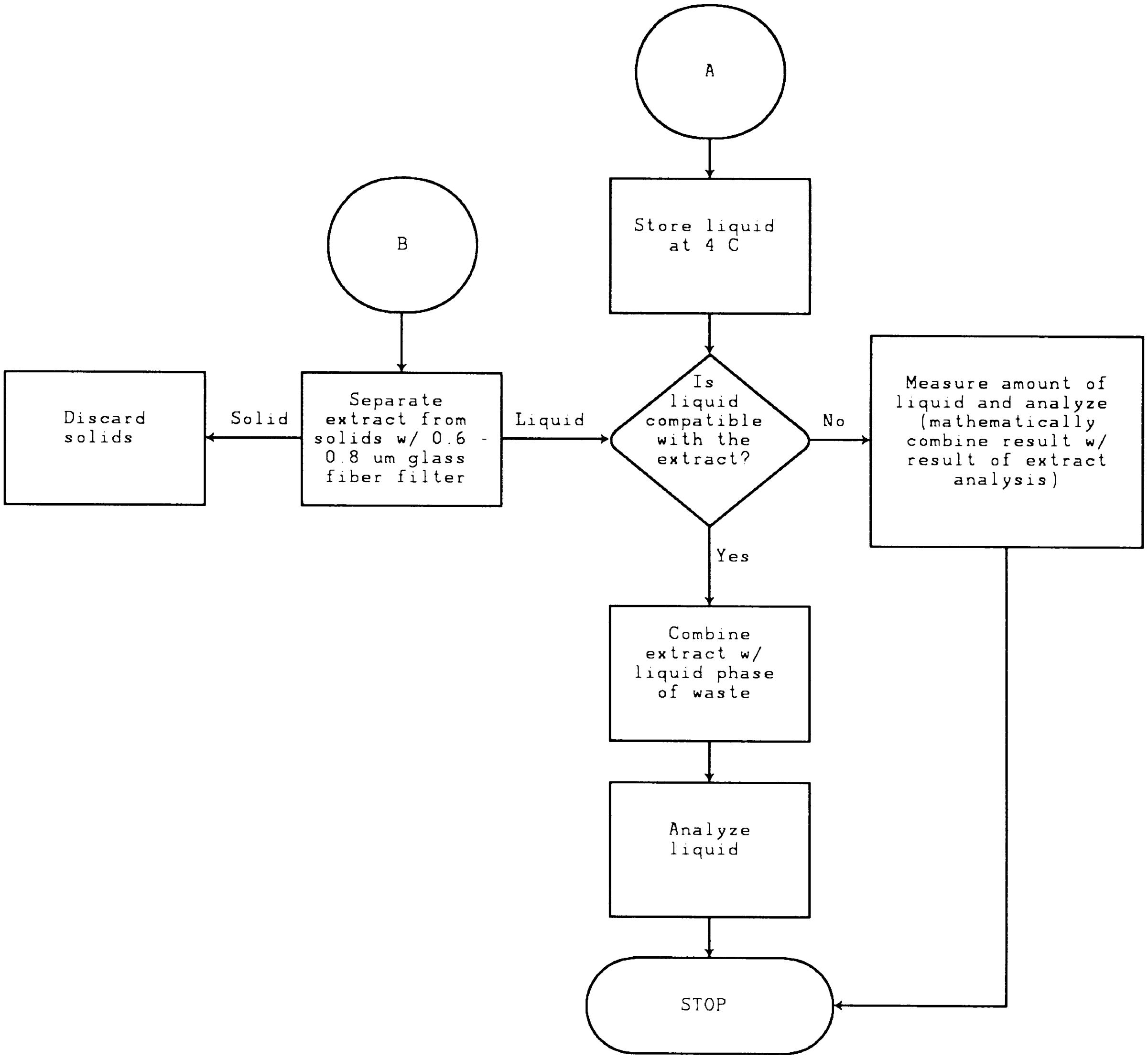
METHOD 1311

TOXICITY CHARACTERISTIC LEACHATE PROCEDURE



METHOD 1311 (CONTINUED) TOXICITY

CHARACTERISTIC LEACHATE PROCEDURE



AMEND: 340-102-0230

RULE TITLE: Episodic Generation

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Removing unnecessary language to add clarity.

RULE TEXT:

(1) The provisions of this rule are in addition to the requirements of 40 C.F.R. 262 Subpart L.

(2) All episodic generators are required to submit an annual hazardous waste generator report and pay hazardous waste generation fees as required by OAR 340-102-0041 and OAR 340-102-0065.

(3) Planned events require prior written Department approval to qualify as episodic.

(4) Generators must submit written notification on the form provided by the Department to DEQ within five days of submitting the initial 72-hour notification for unplanned events.

STATUTORY/OTHER AUTHORITY: ORS 183, 459, 466.020, ORS 466.075, 466.105, 466.165, 466.195, 468

STATUTES/OTHER IMPLEMENTED: ORS 466.075, 466.090

AMEND: 340-105-0120

RULE TITLE: Hazardous Waste Management Fee

NOTICE FILED DATE: 07/18/2022

RULE SUMMARY: Adding section (8) that contains fees that were adopted in Senate Bill 57.

RULE TEXT:

(1) Every person who operates a facility for the purpose of disposing of hazardous waste or polychlorinated biphenyl (PCB) that is subject to interim status or a permit issued under ORS Chapter 466 shall pay a monthly hazardous waste management fee by the 45th day after the last day of each month in the amount authorized by ORS 465.375. For purposes of calculating the fee required by this section, the facility operator does not need to include hazardous waste resulting from on-site treatment processes used to render a waste less hazardous or reduced in volume prior to land disposal.

(2) The term “hazardous waste” means any hazardous waste as defined by rules adopted by the Environmental Quality Commission and includes any hazardous waste as defined in OAR 340, division 100 or 101 or 40 CFR Part 261 handled under the authority of interim status or a management facility permit.

(3) The term “PCB” shall have the meaning given to it in OAR 340, division 110.

(4) The term “ton” means 2,000 pounds and means the weight of waste in tons as determined at the time of receipt at a hazardous waste or PCB management facility. The term “ton” shall include the weight of any containers treated or disposed of along with the wastes being held by the container.

(5) In the case of a fraction of a ton, the fee imposed by section (1) of this rule shall be the same fraction multiplied by the amount of such fee imposed on a whole ton.

(6) Every person subject to the fee requirement of section (1) of this rule shall record actual weight for all waste received for treatment by incinerator or disposal by landfilling in tons at the time of receipt. The scale shall be licensed in accordance with ORS Chapter 618 by the Weights and Measures Division of the Department of Agriculture.

(7) Accompanying each monthly payment shall be a detailed record identifying the basis for calculating the fee.

(8) Notwithstanding section 1 of this rule, the hazardous waste disposal management fee shall be:

(a) $20 per ton for waste received by the facility that is:

(A) PCB under Oregon or federal law;

(B) Hazardous waste that becomes subject to regulation solely as a result of removal or remedial action taken in response to environmental contamination; or

(C) Hazardous waste that results from corrective action or closure of a regulated or nonregulated waste management unit.

(b) $5 per ton for waste that is:

(A) A characteristic hazardous waste at the point of generation and that has been treated at the facility or at an off-site location so that the waste no longer exhibits the characteristics of hazardous waste and so that the waste complies with any applicable land disposal requirements;

(B) Liquid waste when the waste is received and treated at a wastewater treatment unit at the facility so that the waste does not exhibit any characteristics of hazardous waste and so that the resulting liquid is managed at a permitted unit at the facility;

(C) Solid waste that results from cleanup activities and that must be disposed of in a facility for the disposal of hazardous waste as a result of restrictions imposed under ORS 459.055(8) or 459.305(7); or

(D) Solid waste that is not hazardous waste or PCB under a state or federal law at the point of generation and that is not a hazardous waste under Oregon law.

(9) All fees shall be made payable to the Department of Environmental Quality. All fees received by the Department of Environmental Quality shall be paid into the State Treasury.

STATUTORY/OTHER AUTHORITY: ORS 465.400(1), 465.405, ORS 465.375, 465.376, 466.020, 466.075, 466.165, 466.195, 468.020

STATUTES/OTHER IMPLEMENTED: ORS 465.375, 465.376, 466.165