Shrewsbury High School Athletic Campus Improvement Plan Part III: Follow Up

11/9/2016

Peter Spanos, Gale Associates

Patrick Collins, Assistant Superintendent for Finance and Operations
Jason Costa, Athletic Director
Angela Snell, Director of Parks, Recreation, and Cemetery
Michelle Biscotti and Kathleen Keohane, Coordinators of Development & Volunteer Activities

Vision for the Future

Second, multi-sport turf field with lights.

New seating and amenities/storage building

Multi-sport stadium turf and re-surface track with new D areas

Topics

- Project Goals
- Current Conditions & Recent Examples of Weather Impact on Grass Field
- Your Questions and Answers
- Reference Checks
- Environmental and Human Health & Safety Questions Addressed
- Recommended Action and Motion

Safety

- **Numerous federal and state agencies have determined synthetic turf fields do not pose elevated risks for the environment or student athletes:** **[We have provided the committee with documentation from the following agencies as examples but this is not meant to be a complete listing.]**
  - Consumer Product Safety Commission
  - Massachusetts Department of Public Health
  - Connecticut Department of Public Health
  - New York Department of Public Health

Project Goal: Increase Playing Time

- The existing natural grass fields at SHS cannot meet the current or future demand for playing time
- Artificial turf meets the demand by providing a year round, all weather surface
- Playing time on natural grass fields, no matter how well maintained, will always be limited by weather and maintenance requirements

Project Goal: Increase Access

- **Artificial turf will give more SHS teams access to the stadium field for practice and games**
  - SHS soccer teams have very limited access
  - SHS field hockey and SHS lacrosse have no access now
- **It will also give youth sports programs access to the stadium field for games**
  - Youth soccer, lacrosse, field hockey and football have no access currently

Project Goal: Player Safety

- Artificial turf gives players a consistent surface to play on, one that is not subject to weather or maintenance budget restrictions
- Because the field of play is more even, injury incidence and severity are lower than with our natural grass conditions
- Artificial turf has equal or better shock attenuation than natural grass, reducing the risk for concussion. Impact [G-Max] testing will be completed to assure us of safe shock absorption.

Impact of Rain: Recent Example

- **The Friday, October 21 rain event resulted in:**
  - –Boys' Soccer scheduled for home game was moved to opponent's [Tantasqua] turf field venue giving them a home-field advantage and costing our district a bus charter expense
  - –Girls' Soccer postponed so we would not tear up our stadium field for remaining season events
    - •This resulted in the team having three games in the next week: Monday [make-up game], Tuesday, and Thursday which squeezes out time for homework

Impact of Rain: Recent Example

- **The Friday, October 21 rain event resulted in:**
  - –Cancellation of the American Youth Football competition scheduled for the next day [Saturday] on the stadium field
  - –The Girls' Soccer coach moving their next home game off the stadium field due to its poor condition and resulting in the team playing on a smaller JV field

Current Field Condition [11.1.16]

Current Field Condition [11.1.16]

Current Field Condition [11.1.16]

School Committee Questions

- **How will concerns about excessive heat be addressed?**
  - Concerns about excessive heat are primarily attributed to the crumb rubber infill. Our recommendation is to use Envirofill which will be up to 25% cooler than crumb rubber. Further, we have designed installation of water cannons in the event we need them for cooling. Finally, we can and will increase night time use or avoid use if temperatures threaten player safety.

School Committee Questions

- **Can Envirofill be purchased without the Microban® coating?**
  - Yes. There is no cost difference for Envirofill with or without Microban ®
  - 99% of customers opt for the fill with Microban®
  - This form of Microban® is NOT the soluble antimicrobial that was banned from personal care products
  - This form of Microban® is approved by the Environmental Protection Agency and used in many consumer products such as Koala baby products, door handles, countertops etc…

School Committee Questions

- **Have any schools that use Envirofill conducted their own studies to address any health or environmental concerns?**
  - –None of the schools we contacted have conducted their own studies.
  - –Independent lab tests for heavy metals have been completed and you have that report which shows all results are below limit criteria.

School Committee Questions

- **What are the potential revenue opportunities from an artificial turf field?**

Day of Week	Fall	Winter	Spring	Summer
Mon-Fri*	NA	NA	6-9pm	3-9pm
Saturday*	2-9pm	NA	3-9pm	3-9pm
Sunday*	8am-9pm	NA	8am-9pm	3-9pm

  - This proposed schedule from our 10/19 presentation allows for approximately 900-1,100 hours of rental time each year for one turf field

Artificial Turf Rental Hourly Rate Samples

	Youth/Town Groups	Outside Groups
Auburn	Limited use/$0	$ 250.00
Forekicks	$ 150.00	$ 150.00
Foxboro	$ 50.00	$ 135.00
Grafton	$ 20.00	$ 100.00
Newburyport	Season fee	$ 100.00
Norwell	$20- $120	$ 150.00
Reading	$ 125.00	$ 150.00
Wayland	$ 60.00	$ 120.00
Westford	$ 80.00	$ 120.00
Wachusett	No rentals	
Westwood	$ -	$ 150.00
West Bridgewater	$60 to $85	$ 135.00
***Above rates are for field use only. Additional charges typically apply for use of lights, concession stand, and additional event-related staff as needed.*		

- Sampling of rates shows wide range.
- Could not get revenue/expense data for just turf fields as it is often co-mingled with our facility rentals
- Some youth groups provided large up-front donations for field construction in exchange for long-term use agreements at lower or no fee.

School Committee Questions

Synthtic Turf Field: Pro-Forma Rental Plan			
Total Estimated Hours Available for Rentals		900-1,100	Depends on SHS use and weather
Estimate approx. 50% of hours get rented		500	
90% for Shrewsbury Groups @$75/hr	$	37,500	Assumed rental rate subject to approval
10% for Outside Groups @ $150/hr	$	7,500	Assumed rental rate subject to approval
Total Estimated Annual Revenue	$	45,000	
Less Cost of Monitor @ $15/hr	$	(7,500)	Current Parks & Rec. wage rate for monitor
Net Estimated Revenue	$	37,500	
8-year accumulated net revenue	$	300,000	Could be reserved for future carpet replacement
10-year accumulated net revenue	$	375,000	Could be reserved for future carpet replacement
12-year accumulated net revenue	$	450,000	Could be reserved for future carpet replacement

School Committee Questions

- **Do we need special equipment to maintain a synthetic turf field?**
  - A groomer is needed to fluff the turf grass and even the infill periodically. This towed equipment can be attached to existing tractors that Parks & Recreation already owns. The cost of the groomer is included in the budget. Contractors can also be hired to assist if needed.

School Committee Questions

- **How can we respond to concerns about chemical exposure to the environment and our athletes?**
  - The project team has provided the School Committee with Material Safety Data Sheets [MSDS] for all products we propose to specify.
  - The project team has provided the School Committee with the results of independent laboratories and environmental consulting agencies who have determined that the products are safe for the environment and athletes.

School Committee Questions

- **How can we respond to concerns about chemical exposure to the environment and our athletes?**
  - The project team has provided the School Committee with information that the Federal Environmental Protection Agency [EPA] has approved the use of Microban®. Further we have provided information that differentiates the application of Microban® on the Envirofill product from other water soluble uses
  - Microban® use is to protect the product from staining, odors, and mold growth. It does not "rub off" with contact as its infused into the coating.

School Committee Questions

- **Is there any type of natural grass that can withstand our use need.**
  - No. Industry standards call for complete rip out and replace with new sod every five years [approximately $100,000-$110,000]. This has not been done at SHS in the last 14 years since its opening due to financial limitations and disruption of use.

School Committee Questions

- **Is a turf field lifespan connected strictly to wear and tear from use or do its components have a certain life expectancy?**
  - –The carpet will be impacted by the level of use
  - – Carpets come with an eight year warranty and the recent trend is a life expectancy of 10-14 years

School Committee Questions

- **If it takes two years to fundraise [instead of the planned one year], should we expect a heavy inflation factor?**
  - No. The turf carpet industry is competitive and prices remain stable. But variations in fuel for heavy equipment operators could impact pricing.

School Committee Questions

- **Are we aware of any other districts or communities who have done these projects via fundraising without a large donor [i.e. Dunkin Donuts for Shepherd Hill]?**
  - Wellesley
  - Westford
  - Newburyport

School Committee Questions

- **What's the durability of an "organically maintained" field?**
  - We don't know of many municipalities managing their competition fields in this way. We do know that "a root zone is a root zone" and subject to being easily torn up through use under normal conditions and made worse during adverse weather conditions.

School Committee Questions

- **Will a new turf stadium field be accessible by multiple sports [boys and girls]? How will it be lined?**
  - Yes. It's expected that the following teams would have access in addition to the Physical Education Program:
    - Boy's and Girl's Soccer
    - Boy's and Girl's Lacrosse Teams
    - Football
    - Field Hockey
  - We plan to permanently stitch soccer and football lines and use temporary paint for other sports during their season so it's not visually confusing for athletes

Envirofill References

- **Mariemont High School, Mariemont, OH**
  - Tom Nerl, Athletic Director
- **St. Xavier High School, Cincinnati, OH**
  - John Sullivan, Athletic Director
- **Riverside Park, Cincinnati OH**
  - Scott Lahman, Business Specialist
- **Tennessee Tech University, Cookeville, TN**
  - Mark Wilson, Athletic Director
- **Medfield High School**
  - Assistant Superintendent, Soccer Coach

Envirofill References Summary

- **Do you see a difference in injuries?**
  - Fewer knee injuries
  - No increase in skin abrasions
  - No more injuries than a grass field
  - Youth football leagues reported a substantial decrease in injuries since they have been using turf. Soccer has reported they have had less due to the flat / level, consistent surface of the turf as opposed to grass fields.

Envirofill References Summary

- **How do you manage the heat on the field?**
  - Envirofill keeps the field cooler than other turf
  - It's 10-15 degrees cooler than our other turf fields
  - The Envirofill doesn't get hot like other synthetic fields. It will be a little warmer than a regular grass field, but not noticeably.
- **Do you have any health concerns?**
  - None. "...we were happy to report to our community that it is completely green. If any spilled out in the process of installation or removal, it was safe for the soil and could be used as landscaping material."

Envirofill References Summary

“Our athletes like the field. The field plays faster, the ball rolls more consistently and the overall play just feels better.”

“The field has a truer play to it with ball bounce and the feel under the athlete’s feet. We have not had any issue with the product getting in athletes’ faces or sticking to their body, as the crumb rubber will. And most importantly, it is significantly cooler in the summer months…”

“For us, injuries are considered a health concern. With the turf fields, those health concerns are dramatically reduced or eliminated, whereas the grass fields still have the health concerns of injuries.”

Resources Provided

- **Government agency information on synthetic turf fields:**
  - –Massachusetts Department of Public Health [MA DPH], Bureau of Environmental Health, Environmental Toxicology Program, Frequently Asked Questions, Artificial Turf Fields
  - –MA DPH Letter to Concord Public Health Director, April 9, 2015
  - –MA DPH Letter to Needham Public Health Director, April 29, 2008
  - –MA DPH Letter to Medway Public Health Director, March 23, 2015
  - –Consumer Product Safety Commission Press Release: "CPSC Staff Finds Turf Fields OK to Install, OK to Play On", July 30,2008
  - –New York Department of Public Health Fact Sheet, Crumb Rubber Infilled Synthetic Turf Fields, August 2008
  - –Connecticut Department of Public Health, "Recent News Concerning Turf Fields", January 20, 2015

Resources Provided

- **Regarding Envirofill:**
  - –Product Overview
  - –Frequently Asked Questions
  - –Independent Laboratory Results-Heavy Metals Testing, April 12, 2016
  - –Envirofill Material Safety Data Sheet
  - –Microban® Product Information including EPA approval
  - –Microban® Overview

Resources Provided

- **Regarding Brock Shock Pads**
  - Environmental Compatibility Analysis of Brock Powerbase Shock Pad, Teeter Engineering, March 18,2016
  - Environmental Compatibility Analysis of Brock SP14 Shock Pad, Teeter Engineering, March 18,2016
  - JSP Material Certification, ARPRO Expanded Polypropylene [EPP] Foam, FDA Compliance, January 23, 2015
  - Brock Environmental Statement, “Cradle to Cradle” Certification
  - Brock Powerbase YSR, Material Safety Data Sheet
  - Brock Powerbase SP14, Material Safety Data Sheet
  - Brock Material Certification, Compliance with California Proposition 65 [Safe Drinking Water and Toxic Enforcement Act of 1986], April 28, 2015
  - Dudek [Environmental Consultants], Revised Evaluation of Turf Laboratory Analytical data, Brock International, April 9, 2015

Resources Provided

- **Regarding turf carpet**
  - Consumer Product Safety Commission Guidance on Lead
  - Shaw Industry Product Safety Statement
  - Tencate Product Material Safety Data Sheet
  - Powerblade HP Material Safety Data Sheet
  - Lab Report Shaw HP Slit Turf Product
  - Lab Report Shaw SportsTurf Primary Backing
  - Lab Report Shaw SportsTurf Secondary Backing
  - Lab Report Shaw PE Monofilament Turf Product

Resources Provided

- **Current exposures**
  - CEV-Mountain Green Fertilizer, Material Safety Data Sheet
  - Brite Stripe, All Colors Field Paint, Material Safety Data Sheet
  - Brite Stripe, White Field Paint, Material Safety Data Sheet

Summary

- **The project committee recommends that the School Committee vote to approve this project plan based upon:**
  - –1) the benefits it will afford our community,
  - –2) the fact that it will be funded through donor support and previously approved funding for track renovation, and
  - –3) the due diligence conducted to ensure environmental and player safety

Vision for the Future

Second, multi-sport turf field with lights.

New seating and amenities/storage building

Multi-sport stadium turf and re-surface track with new D areas

Recommended Motion

- **That we approve Phase 1 of the Shrewsbury High School Athletic Campus Improvement Plan**
  - –as detailed in the document titled “Shrewsbury Track and Field Renovations- Schematic Cost Estimate” [dated 10.6.2016] and proceed to final design and preparation of construction documents
  - –using synthetic turf carpet and shock pad materials as provided in our meeting documents or their equivalents and
  - –the Envirofill with Microban® infill material and
  - –authorize related fundraising activities to begin immediately.

Shrewsbury Public Schools

Joseph M. Sawyer, Ed.D.
Superintendent

November 4, 2016

To: School Committee
Re: Recommendation to support improvements to SHS athletic facilities

Your November 9 meeting materials includes a large volume of information related to the recommended installation of a synthetic turf field in the SHS stadium to assist you with your decision regarding whether to vote to approve this project to go forward, subject to raising sufficient funds outside of the appropriated budget. I recommend that you vote to approve this project for the reasons listed below. As you know, there is a group of Shrewsbury citizens who would prefer to maintain a natural grass field, and who recommend a change in managing that grass field to "organic" management. Just today you received an email from this organization with many links to various information, and I will review this information in advance of Wednesday. I truly appreciate these citizens' interest in the issue, and I have reviewed their previous comments and submissions and will further review the new information they have provided in order to seriously consider their perspective. I am confident that you will as well.

This group's original objection to the project centered on the potential use of a crumb rubber material infill on the synthetic turf field, which is a controversial product that has resulted in objections across the country due to alleged health risks related to player contact with this material. Various agencies and universities in the U.S. and Europe have studied crumb rubber over the past decade, and there have been no findings that have caused the material to be withdrawn from use. The Massachusetts Department of Public Health documents in your packet are particularly helpful in illustrating the questions and issues surrounding the use of crumb rubber, and, as you know, Shrewsbury student-athletes play on crumb rubber infill surfaces at many away games.

However, since the team for this project is recommending a different infill, Envirofill, due to factors including the quality of performance, its durability, and the ability to recycle the material and re-use it for another cycle when the synthetic turf needs to be replaced. A secondary benefit of selecting Envirofill, which is 98% silica sand encapsulated in an acrylic coating, is that it negates any concerns that any citizens have regarding a crumb rubber infill. Specific information regarding Envirofill, the underlying Brock shock pad, and the synthetic turf material that would be installed is also enclosed. Again, the many studies and guidance issued by public health agencies focus almost exclusively on questions regarding crumb rubber infill, which is not part of this project. The email you received today from the group opposing the project references a variety sources that

question the use of synthetic turf generally, and as mentioned above we will review these prior to our meeting Wednesday, as I'm sure you will as well.

I believe that the information you have from the team and from citizens who object is sufficient to make a responsible decision. As with any school improvement project, whether the recent HVAC system replacements at two of our schools, asphalt paving of playground areas, purchase of new cafeteria tables, etc., there are synthetic materials that are part of the school environment. Regulatory agencies are responsible for indicating whether such materials, whether in the whole or as components, pose any significant risk to public health, and we rely on this information. I see this project through the same lens.

The completion of this project will result in a playing surface that provides significantly increases access and frequency of use and a higher quality playing surface that is expected to reduce the risk of injury compared to our current situation. I recommend that you vote to approve the recommendations made by the project team regarding the installation of a synthetic turf field in the Shrewsbury High School stadium.

Thank you for taking the time to review the information provided. I look forward to the discussion of this topic at the meeting on November 9.

Shrewsbury Track and Field Renovations

Schematic Cost Estimate

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST	TOTAL COST	REMARKS
1	**General Conditions**					**$ 310,086.47**	
1a	Bonds, Insurance (2%), Overhead, and Profit (15%)	LS	1	$ 260,086.47	$ 260,086.47		
1b	Mobilization/Demobilization	LS	1	$ 50,000.00	$ 50,000.00		
2	**Erosion Control, Site Preparation, and Demolition**					**$ 93,483.18**	
2a	Temp. Construction Entrance (8" Stone)	SY	59	$ 13.70	$ 803.73		
2b	Silt Fence	LF	616	$ 5.00	$ 3,080.00		
2c	Remove Existing Drainage (or abandon in-place and flowable filll)	LS	1	$ 10,000.00	$ 10,000.00		
2d	Cut and Cap Irrigation, Remove Field Irrigation (Protect Main Water Line)	LS	1	$ 5,000.00	$ 5,000.00		
2e	Remove Goal Posts, Long Jump, And Triple Jump Areas	LS	1	$ 3,000.00	$ 3,000.00		
2f	Strip & Haul Topsoil (8")	CY	2,442	$ 18.00	$ 43,955.56		
2g	Scrape and Remove Track Surfacing	SY	4,430	$ 5.00	$ 22,149.44		
2h	Rough Grading of Site Subgrade	SY	10,989	$ 0.50	$ 5,494.44		
3	**Synthetic Turf**					**$ 798,822.84**	
3a	Prepare Sub-base, Shape, and Compact	SY	8668	$ 2.25	$ 19,503.25		
3b	Crushed Stone Base Under Field (10")	TON	3,612	$ 32.00	$ 115,574.81		
3c	Alternative Infill/Turf (Including Groomer)	SF	78,013	$ 5.00	$ 390,065.00		
3d	Shock Pad	SF	78,013	$ 1.50	$ 117,019.50		
3e	Field Striping (Per Sport)	EA	2	$ 10,000.00	$ 20,000.00		
3f	Geotextile Separation Layer	SY	8,668	$ 2.50	$ 21,670.28		
3g	10" Perf. HDPE	LF	946	$ 23.00	$ 21,758.00		
3h	6" Perf. HDPE	LF	266	$ 20.00	$ 5,320.00		
3i	Flat Panel Drains	LF	3318	$ 4.00	$ 13,272.00		
3j	Drainage Manholes	EA	8	$ 1,600.00	$ 12,800.00		
3k	Cast-In-Place Concrete Curb (Both D-Areas)	LF	390	$ 32.00	$ 12,480.00		
3l	Modify Existing Concrete Trench Drain for Turf Nailer	LF	780	$ 12.00	$ 9,360.00		
3m	Turf Endzone Lettering	LS	1	$ 40,000.00	$ 40,000.00		
4	**Track and D-Area** *1					**$ 392,892.42**	
4a	Prepare Sub-Base, Shape, and Compact (D-Areas)	SY	2,387	$ 2.25	$ 5,371.75		
4b	Aggregate Base Course for D-Areas (8")	TON	796	$ 30.00	$ 23,874.44		
4c	Pavement (1.5" Binder Course and 1.5" Wearing Course) (D-Areas)	SY	2,387	$ 23.00	$ 54,911.22		
4d	BSS-100 Track Surfacing (D-Areas, Track and Pole Vault Area)	SY	6,861	$ 45.00	$ 308,735.00		
5	**Utilities/Lighting**					**$ 40,000.00**	
5a	Irrigation Line Contingency	LS	1	$ 30,000.00	$ 30,000.00		
5b	Electrical Contingency	LS	1	$ 10,000.00	$ 10,000.00		
5c	Electronic Controls (Upgrades for Athletic Lighting)	LS	1	$ -	$ -		
6	**Equipment**					**$ 89,000.00**	
6a	Football/Soccer Combined Goal Posts	PR	1	$ 30,000.00	$ 30,000.00		
6b	Scoreboard Replacement (reuse existing foundations)	EA	1	$ 23,000.00	$ 23,000.00		
6c	16' High Safety Netting at D-Areas	LF	240	$ 150.00	$ 36,000.00		
7	**Repairs**					**$ 65,722.00**	
7a	Fencing Repairs	LF	1,660	$ 35.00	$ 58,100.00		
7b	Grandstand Repairs	LS	1	$ 5,000.00	$ 5,000.00		
7c	Repaving of walkway (visitor seating area)	SY	114	$ 23.00	$ 2,622.00		
					Subtotal	**$ 1,790,006.91**	
					15% Contingency	**$268,501.04**	
					Total	**$2,058,507.95**	

Notes:

1) Item #4; + $285,000 allocated through Parks and Recreation for track resurfacing.

9	**Water Supply**						
9a	3/4" Copper Water service	LF	50			**$ 3,500.00**	
9b	Concrete Pad	LS	1	$ 35.00	$ 1,750.00		
9c	Post Hydrant	LS	1	$ 250.00	$ 250.00		
				$ 1,500.00	$ 1,500.00		

PHASE 1	Budget	Notes
General Conditions	$ 310,086	Bonds, insurance, overhead, profit
Erosion Control, Site Preparation, and Demolition	$ 93,483	Site and silt fencing, topsoil removal
Synthetic Turf	$ 798,823	Sub-base, shock pad, carpet, infill, lettering
Track and D-Area	$ 392,892	Re-surface track and new surafce "D" areas
Utilities/Lighting	$ 40,000	Re-route irrigation, lighting contingency
Equipment	$ 89,000	Football and soccer goals, scoreboard, safety net
Repairs	$ 65,722	Stadium seating and asphalt repairs
Project Contingency [15%]	$ 268,501	Unforseen conditions or change orders
Total Project Cost	$ 2,058,508	
Less appropriated/approved funds for track repair	$ (285,000	Town meeting approved and SHS Bldg fund
Net Cost to Fundraise	$ 1,773,508	Private donors, naming rights, grants

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
250 Washington St., 7th Floor, Boston, MA 02108-4619
Phone: 617-624-5757 Fax: 617-624-5777
TTY: 617-624-5286

April 29, 2008

Janice Berns, Director
Needham Board of Health
1471 Highland Avenue, Room 24
Needham, MA 02192

Dear Ms. Berns:

The Massachusetts Department of Public Health (MDPH), Bureau of Environmental Health (BEH) has reviewed the findings of various public health agencies that have been involved with addressing public health concerns associated with artificial turf. We have also reviewed scientific publications and information from advocacy groups relative to potential health effects from exposure opportunities to chemicals in synthetic turf.

Components of turf include artificial grass fibers and crumb rubber and sand infill overlaid on a carpet backing. Grass fibers are composed of nylon or polyethylene. The state of New Jersey tested dust from both synthetic turf composed of nylon grass fibers, as well as polyethylene grass fibers. They reported that elevated levels of lead were found in two of twelve samples, both of which were nylon. No lead was found in synthetic turf with polyethylene grass fibers. Thus, based on available information, it appears that polyethylene grass fibers are preferable to nylon grass fibers.

Crumb rubber infill is typically made of recycled tires. This material has been found to contain chemicals, including polycyclic aromatic hydrocarbons (PAH), metals, and volatile organic compounds (VOC). While these chemicals are in the material of the crumb rubber, current information does not suggest significant exposure opportunities to the chemicals in the materials such that we would expect health effects.

The most relevant study we identified to evaluate potential health effects related to the fill was a California study. California's Office of Environmental Health Hazard Assessment completed a study investigating the potential health risks of playground surfaces and track surfaces that are composed of recycled tires. MDPH feels that this is the most complete and relevant study at this time, as these materials are similar to those used in the infill of synthetic turf. Findings from this assessment concluded that exposure opportunities to the rubber materials would not be expected to result in health effects

With respect to the temperature issues you raised during our recent conversation, I asked our staff for an opinion of protocols for use during hot weather periods. Available information

suggests heat levels rise on some artificial turf material as outdoor temperatures rise. Thermoplastic rubber (TPE) infill can be used as an alternative to infill from recycled tires. TPE is manufactured in lighter colors which are thought to generate less heat than black infill. TPE also does not contain recycled products and is made of polyethylene or polypropylene and rubber. Based on a brief review of the literature, there is information suggesting that the composition of polyethylene or polypropylene and rubber presumably contains fewer chemicals than infill made of recycled tires.

In summary, MDPH/BEH believes that based on the available information, the use of polyethylene artificial turf is not expected to result in health impacts. However, if there are ongoing concerns regarding artificial turf and health impacts, the town may want to consider using a turf that is light colored, composed of polyethylene grass fibers, and has TPE infill (as opposed to infill consisting of recycled tires). If you have any questions, please feel free to contact us at 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

Cc: Peter Connolly, Needham Board of Health

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

EHS Circular Letter #2015-02
(Follow up to Circular Letter #2014-26a)

DATE: January 20, 2015

TO: Local Health Departments and Districts

FROM: Brian Toal, Gary Ginsberg
Environmental and Occupational Health Assessment

RE: Recent News Concerning Artificial Turf Fields

Brief Video Clip for Local Health Departments – *Click Here* →

This letter and video clip are being sent to update you regarding the news story that has circulated since last spring regarding potential cancer risks at artificial turf fields. Various media outlets have continued to run this story and a number of local health departments have inquired as to its validity. Since many Connecticut towns have installed or are considering artificial turf fields an elevated cancer risk would be an important consideration. However, this news story is still based upon very preliminary information and does not change CTDPH's position that outdoor artificial turf fields do not represent an elevated health risk.

The Connecticut Department of Public Health has evaluated the potential exposures and risks from athletic use of artificial turf fields. Our study of 5 fields in Connecticut in 2010-2011 was a comprehensive investigation of releases from the fields during active play. This study was conducted as a joint project with the CT DEEP and the University of CT Health Center and was peer-reviewed by the Connecticut Academy of Science and Engineering. Our study did not find a large amount of vapor or particle release from the fields confirming prior reports from Europe and the US. We put these exposures into a public health context by performing a risk assessment. Our risk assessment did not find elevated cancer risk. These results have been published as a set of 3 articles in a peer review journal and are available on the DPH artificial turf webpage (http://www.ct.gov/dph/cwp/view.asp?a=3140&q=464068).

The news story suggests soccer players and especially goalies may have an elevated cancer risk from playing on artificial turf fields. This is based upon anecdotal observations of a university soccer coach (http://www.komonews.com/news/local/Soccer-coach-Could-field-turf-be-causing-cancer-259895701.html). Reportedly the coach is developing a list of soccer players who have contracted cancer. However, the types of cancer are undocumented and so it is impossible to say whether they

Keeping Connecticut Healthy
DPH
Connecticut Department of Public Health

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represent a common effect and there has been no reporting on how long the goalies played on artificial turf fields to see if there was plausible exposure and latency. There are many reasons why someone collecting a list of cancer cases may appear to find a cluster including the fact that when you have a single-minded focus on finding cases you do not capture all the non-cases that would tend to disprove the cluster. Documentation of an increased rate in soccer players would require an epidemiological study in which the total number who play on turf fields in a given region was also known so that a cancer rate could be established and compared to those that do not play on artificial turf fields. The current news report does not constitute epidemiological evidence and thus is very preliminary.

Our risk assessment did cover carcinogens that are known to be in recycled tires and the crumb rubber used to cushion fields. Once again, we found there to be very little exposure of any substances, carcinogenic or not, in the vapors and dust that these fields generate under active use, summer conditions. Background levels of chemicals in urban and suburban air from heating sources and automobile traffic are much more significant sources of airborne carcinogens. The fact that we sampled 5 fields (4 outdoor and 1 indoor) of different ages and composition suggests that the results can be generalized to other fields, a conclusion supported by the fact that results were similar to what was found in California, USEPA and European studies. Our study did not evaluate ingestion of the crumb rubber itself as players are unlikely to ingest an entire rubber pellet. However, two studies, one in California and one at Rutgers University did evaluate the cancer risk if children ingested a mouthable chunk of playground rubber (10 gram), using laboratory extraction methods to estimate the amount of chemicals that might become available in the stomach and absorbed into the body. Both studies found very low cancer risk from this scenario (Cal OEHHA 2007; Pavilonis et al. 2014). Thus, CT DPH finds no scientific support for a finding of elevated cancer risk from inhalation or ingestion of chemicals derived from recycled tires used on artificial turf fields. US EPA has a similar position: "At this point, EPA does not believe that the field monitoring data collected provides evidence of an elevated health risk resulting from the use of recycled tire crumb in playgrounds or in synthetic turf athletic fields." (http://www.epa.gov/epawaste/conserve/materials/tires/health.htm)

In summary, federal and state authorities have taken seriously the concerns that artificial turf fields may present a health risk due to contaminants in recycled rubber. The best way to investigate these concerns is via an exposure investigation. Studies conducted in Connecticut and elsewhere have shown a very low exposure potential, less than from typical outdoor sources of air pollution. The current news reports of a list of soccer players with cancer does not constitute a correlation or causality and thus raises a concern that currently lacks scientific support. Thus, the CT DPH position expressed in 2011 at the conclusion of the Connecticut study, that outdoor artificial turf fields do not represent an elevated health risk, remains unchanged. For further information please contact Brian Toal or Gary Ginsberg at 860-509-7740.

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FACT SHEET
Crumb-Rubber Infilled Synthetic Turf Athletic Fields
August 2008

PURPOSE
There are several kinds of synthetic turf surfaces (*e.g.*, surfaces that use a fill material ("infill") between the blades of artificial grass and those that do not), and synthetic turf may be installed for different uses (*e.g.*, single or multiple sport athletic fields, landscaping, golf applications). The focus of this fact sheet is athletic fields with crumb rubber infilled synthetic turf. This fact sheet was developed to assist people in making decisions about installing or using this kind of synthetic turf athletic field. Considerations related to other kinds of synthetic turf fields are not addressed in this fact sheet.

BACKGROUND
The first well-publicized use of AstroTurf, a synthetic turf for athletic fields, was at the Houston Astrodome in 1966. This first generation of synthetic turf was essentially a short pile carpet with a foam backing. Since then, design changes have resulted in a greater variety of synthetic turf athletic fields. One type of synthetic turf is fabricated using synthetic fibers, manufactured to resemble natural grass, and a base material that stabilizes and cushions the playing surface. The fibers are typically made from nylon, polypropylene or polyethylene and are connected to a backing material. The base material, also called infill, consists of one or more granular materials that are worked in between the fibers during the installation process. Commonly used base materials are granulated crumb rubber (usually from used tires), flexible plastic pellets, sand, and rubber-coated sand. A combination of sand and crumb rubber is often used.

Crumb rubber is produced by grinding used tires. Steel and fiber tire components are removed during the process and the rubber pellets are sorted by size. Pellet sizes ranging from about one-sixteenth to one-quarter inch in diameter are used on synthetic turf. Crumb rubber is typically applied at a rate of two to three pounds per square foot of field surface.

HEALTH AND SAFETY CONSIDERATIONS
Some potential health and safety considerations related to synthetic turf have generated public concern. These include:

- Heat stress
- Injury
- Infection
- Latex allergy
- Chemical exposure

Heat Stress

Synthetic turf fields absorb heat, resulting in surface temperatures that are much higher than the temperatures of the surrounding air. In June 2002 at Brigham Young University (BYU) in Utah, the average surface temperature on a synthetic turf field was reported to be 117°F while the average surface temperatures on natural turf and asphalt were 78°F and 110°F, respectively. A maximum surface temperature of 200°F on the BYU synthetic turf field was reported. A turfgrass specialist at the University of Missouri reported measuring an air temperature of 138°F at "head-level" height on the university's synthetic turf field on a sunny 98°F day. The surface temperature of the field was reported to be 178°F. A study conducted at Penn State University measured surface temperatures on experimental plots of nine different types of infilled turf. Temperature measurements were made on three occasions. The average air temperatures reported were 79°, 78°, and 85°F. The corresponding average surface temperatures reported for the synthetic turf plots are 120°, 130° and 146°F.

Water can be applied to synthetic turf to reduce the surface temperatures on warm days. A study at BYU found that watering synthetic turf lowered the surface temperature from 174°F to 85°F, but the temperature rose to 120°F in five minutes and to 164°F in twenty minutes. A study conducted by Penn State University on experimental synthetic turf plots examined the effect of watering synthetic turf on surface temperature. Measurements were made on three occasions. For one monitoring period, surface temperatures ranging from about 130° to 160°F were lowered initially to about 75°F, but increased within 30 minutes to temperatures ranging from about 90° to 120°F, where they remained fairly stable for the three-hour monitoring period.

The surface temperatures reported on synthetic turf fields can get high enough to reach levels of discomfort and may contribute to heat stress among users of the fields. While watering synthetic turf may reduce surface temperatures, other factors are likely to influence its effectiveness. At the present time, NYSDOH is unaware of any studies that have examined the role of synthetic turf in contributing to heat stress or that have compared the occurrence of heat stress among athletes playing on natural turf and synthetic turf.

Because of the potential for high temperatures on infilled synthetic turf fields, it is important that people who play or work on the fields be provided with adequate warnings regarding the potential for heat stress. People should also be advised to remain hydrated and to seek relief from the heat in shaded areas. The potential for and frequency of high surface temperatures warrant consideration when making decisions about installing and using a synthetic turf field.

Injury

There is a common perception that there are more sports injuries on synthetic than on natural turf athletic fields. Many factors influence the rate of sports injuries, including the type of playing surface. The many kinds of synthetic turf surfaces and changes in the turf products over the years complicate the assessment of how the playing surface affects injury rates. Other risk factors have been implicated in injury rates among athletes, in addition to the type of playing surface. These risk factors include level of competition, skill level, age, shoe type, previous injury and rehabilitation, and a number of individual physical characteristics. We identified five studies that compared injury (*e.g.*, sprains, lacerations, fractures) rates among athletes when playing on infilled synthetic turf and natural turf fields. Although the ability of the studies to detect differences in the injury rates was limited by the small number of injuries reported, the

studies concluded that there were no major differences in overall injury rates between natural and infilled synthetic turf. Although each study found some differences in specific injury types, there was no consistent pattern across the studies.

The potential for head injuries from contact with the surfaces has been assessed by determining the ability of the surfaces to absorb impacts. Tests have shown that the force of impact on asphalt surfaces is much higher than the level generally accepted to be associated with serious head injury. The force of impact on many types of natural turf and all types of synthetic turf tested are below this level. The force of impact on frozen natural turf is typically above the acceptable level. No data are available for the force of impact on frozen synthetic turf.

The abrasiveness of synthetic turf fibers may contribute to the injury risk among athletes, particularly for abrasions or "turf burns." The degree of abrasiveness appears to be dependent on the composition and shape of the turf fibers. A study conducted at Penn State University suggests that synthetic turf with nylon fibers is more abrasive than synthetic turf with other types of fibers.

Infection Risk

Some people have expressed concern that infections, including methicillin-resistant *Staphylococcus aureus* (MRSA), may be more common among users of synthetic turf fields than users of natural turf fields. This possibility has not been studied systematically, and no definitive statements can be made about differences in risk between the two surfaces.

At least two questions are important in evaluating the risk of infection. Does skin damage occur more frequently on synthetic turf than natural turf, thus providing a place where infections are more likely to occur? Are there more germs on synthetic turf than natural turf?

While injury studies have not consistently identified differences in abrasion and laceration risks between natural and infilled synthetic turf, some types of synthetic turf may result in more skin abrasions. Although very few tests have been performed, the available data do not suggest the widespread presence of infectious agents, such as MRSA, on synthetic turf fields. Also, the available information indicates that outdoor or indoor synthetic turf surfaces are no more likely to harbor infectious agents than other surfaces in those same environments. Disease outbreak investigations conducted in response to illnesses caused by a variety of germs (*e.g.*, MRSA, *Campylobacter*, meningococcus, echovirus, herpes simplex virus, hepatitis virus, coxsackie virus) have not identified playing fields, either natural or synthetic, as likely to increase the risk of transmitting infections.

Skin cuts and abrasions that may result from contact with athletic fields, including both natural and synthetic fields, are susceptible to infection. Athletes and others developing skin abrasions should clean the wounds and seek prompt medical attention. Athletes should avoid sharing towels (on and off the field), equipment, razors, soap and other objects with others, because sharing these items can spread germs.

Latex Allergy

Latex, a substance found in natural rubber, contains substances called "latex allergens," which can cause an allergic response in some people. About 6 percent of the general population is allergic to the substances in latex. Tire rubber contains the latex allergen, although at much lower levels than in latex

gloves and other consumer products. People playing on synthetic turf may be exposed to latex allergens through direct contact with the skin (dermal exposure) and inhalation of small rubber particles suspended in the air.

A study conducted for the California Environmental Protection Agency tested samples of tire rubber on the skin of guinea pigs. None of the animals developed any rashes or allergic reactions from contact with the rubber.

Whether crumb rubber can cause an allergic response in people is not known. NYSDOH is unaware of any occurrences of latex allergy associated with contact with crumb rubber or synthetic turf fields.

Chemical Exposure

Exposure to a chemical requires contact with it. Contact with a chemical occurs in three ways: swallowing it (ingestion exposure), breathing it (inhalation exposure), and having it come in contact with the skin (dermal exposure) or eyes (ocular exposure). The potential for harmful effects from exposure to a chemical depends on the amount of the chemical a person contacts, how the chemical enters the body (ingestion, inhalation, dermal, or ocular), how often contact occurs, and the toxic properties of the chemical. The ability of a chemical to be released from a substance (*e.g.*, crumb rubber) is an important factor in determining how much exposure actually occurs. Other factors that can influence a person's risk for adverse health effects from environmental chemicals include age, gender, general health, genetic differences, exposure to other chemicals and lifestyle choices.

Tires are manufactured from natural and synthetic rubbers along with numerous chemical additives, including zinc, sulfur, carbon black, and oils that contain polyaromatic hydrocarbons (PAHs) and volatile organic chemicals. Because crumb rubber is manufactured from used tires, it probably contains the same chemicals as tire rubber.

Studies have been conducted by the California Environmental Protection Agency Office of Environmental Health Hazard Assessment and the Norwegian Institute of Public Health to assess the potential for ingestion exposure to the chemicals in crumb rubber by children playing on synthetic turf. Both studies concluded that health risks to children resulting from the ingestion of crumb rubber are low.

The Norwegian Institute of Public Health also collected data to assess potential health risks resulting from dermal and inhalation exposures to chemicals contained in synthetic turf fields. Health assessments were conducted for adults and children. The researchers concluded that adverse health effects resulting dermal exposures to crumb rubber or from inhalation exposures to organic chemicals released from the fields are unlikely. No health assessment of the concentrations of rubber particles in the air was made.

A French study measured the concentrations of organic chemicals emitted as gases (known as volatile organic compounds or VOCs) from crumb rubber under laboratory conditions. The data were used by the French National Institute for Industrial Environment and Risks to evaluate possible health effects from inhaling VOCs released from synthetic turf. The study authors concluded that the concentrations of organic compounds emitted did not pose a health concern for athletes, officials or spectators.

Some types of synthetic turf fibers contain elevated levels of lead (*e.g.*, in the range of about 2,000 to 9,000 parts per million). Degradation of these fibers can form a dust that presents a potential source of

lead exposure to users of the fields. The Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry addressed the potential for lead exposures from synthetic turf fibers in a June 2008 Health Advisory (http://www.cdc.gov/nceh/lead/artificialturf.htm). For new or replacement installations, select synthetic turf products that do not have elevated lead levels.

Our review of the available information on crumb rubber and crumb rubber infilled turf fields indicates that ingestion, dermal or inhalation exposures to chemicals in or released from crumb rubber do not pose a significant public health concern.

OTHER CONSIDERATIONS

A number of other factors may need to be considered when installing and using synthetic turf.

Use: Synthetic turf is more durable than natural turf and can be used without the rest periods that natural turf requires to keep the turf healthy. The New York City Department of Parks and Recreation (NYCDPR) estimates that on an annual basis, permitted use (hours per year) for synthetic turf athletic fields is 28 percent higher than for natural grass fields.

Installation: Installation costs of synthetic turf vary depending on the amount of site preparation required and the specific field design. The installation costs of synthetic turf are generally much higher than the installation costs of natural turf.

Maintenance: The maintenance costs of synthetic turf will vary depending on the field's use and design, but are typically estimated to be lower than the maintenance costs of natural turf. Natural turf requires regular mowing, fertilizer application, pest control and possibly watering. Synthetic turf requires replacing infill materials, repairing seams and removing weeds and moss. Specialized equipment, which may or may not be included in the field's purchase price, is required for these activities.

Lifetime: NYCDPR estimates that the lifetime of a natural turf field is on the order of five years. The synthetic turf industry estimates that the lifetime of an infilled synthetic turf athletic field is eight to ten years, depending on care during installation and use. NYCDPR and other New York entities have seen similar lifetimes.

SUMMARY OF INFORMATION FOR CRUMB-RUBBER INFILLED SYNTHETIC TURF ATHLETIC FIELDS

Heat stress	Surface temperatures on crumb-rubber infilled synthetic turf fields can reach levels of discomfort and may contribute to heat stress. This warrants consideration when making decisions about installing and using a synthetic turf field. While watering synthetic turf may briefly reduce surface temperatures, a number of factors may influence its effectiveness. People using these fields should be advised to remain hydrated and to seek relief from the heat in shaded areas.
Injury	Overall, studies have found no consistent differences in injury rates between natural and crumb-rubber infilled synthetic turf.
Infection	Skin cuts and abrasions that may result from contact with athletic fields (natural and synthetic turf) are susceptible to infection. Athletes and others developing skin abrasions should clean the wounds and seek prompt medical attention. Athletes should avoid sharing equipment, razors, towels, soap and other objects with others, because these items can spread germs.
Latex allergy	At the present time, NYSDOH is unaware of any occurrences of latex allergy resulting from contact with crumb rubber or synthetic turf fields.
Chemical exposures	Based on the available information, chemical exposures from crumb rubber in synthetic turf do not pose a public health hazard.

WHERE CAN I GET MORE INFORMATION?

If you have any questions about the information in this fact sheet or would like to know more about in-filled synthetic turf athletic fields, please call the NYSDOH at 1-800-458-1158 or write to the following address:

New York State Department of Health
Bureau of Toxic Substance Assessment
Flanigan Square, 547 River St.
Troy, NY 12180-2216

SOME RELEVANT REFERENCES

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April 9, 2015

Susan G. Rask, M.S., R.S.
Public Health Director
Town of Concord
141 Keyes Road
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Dear Ms. Rask:

Thank you for your letter of March 27, 2015, in which you requested that the Massachusetts Department of Public Health, Bureau of Environmental Health (MDPH/BEH), provide you with information concerning the use of crumb rubber infill material for artificial turf fields and potential health impacts. As you are likely aware, our office has had similar requests from some other municipalities regarding this issue, most recently from the health agent in Medway, Massachusetts.

In response to your request, I am including the summary provided to Medway on March 23, 2015, of our review of the most current scientific literature related to potential exposure to artificial turf components, including crumb rubber infill, and health impacts, including cancer, in relation to exposure to such turf. Recent local media reports on soccer players, particularly goalies, that have played on artificial turf and the incidence of some cancers have been expressed, notably non-Hodgkin's lymphoma, Hodgkin Lymphoma, and osteosarcoma.

Updated Literature Review

In previous evaluations performed during the period 2008-2013 for the Town of Needham, we noted that crumb rubber infill has been found to contain chemicals, including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and metals. We further stated that although these chemicals are in the material itself, information available at that time did not suggest significant exposure opportunities to the chemicals in the materials such that we would expect health effects.

We noted that the most relevant study on this topic at the time was a study conducted by the California Office of Environmental Health Hazard Assessment (CA OEHHA).

Since that time, the CA OEHHA conducted additional evaluations of chemical concentrations in air above crumb rubber turf fields under active use (CA OEHHA 2010). Air samples were taken above fields and analyzed for VOCs and metals. Results suggested that adverse health effects were unlikely to occur from inhalation of VOCs or metals in particulates above these fields. To assess the potential for skin infections due to bacteria or to skin abrasions on these fields, tests for bacterial contamination were performed and the frequency of skin abrasions was assessed. Researchers found fewer bacteria detected on the artificial turf compared to natural turf, suggesting that the risk of infection to athletes using these fields was actually lower. However, more skin abrasions were observed in athletes using artificial turf fields than natural turf fields, and the study authors made various recommendations to help prevent skin abrasions (e.g., protective equipment or clothing) and prompt treatment of skin abrasions.

In another study, the state of Connecticut conducted air sampling at four outdoor artificial turf fields with crumb rubber infills (most relevant to Medway) under summer conditions (Simcox et al. 2011; Ginsberg et al. 2011). Air measurements were taken using stationary air sampling monitoring devices as well as personal samplers (placed on people using the fields). They concluded that exposure opportunities to turf contaminants were not associated with elevated health risks and suggested that their findings were consistent with other studies available at the time. A letter prepared by the Connecticut Department of Public Health reiterates these conclusions (CTDPH 2015).

A 2014 study by researchers at the Rutgers Robert Wood Johnson Medical School in New Jersey evaluated opportunities for exposures to PAHs, semivolatile organic compounds (SVOCs), and heavy metals from exposures to artificial turf fibers and crumb rubber infills by measuring these constituents in simulated body fluids (digestive fluids, lung fluids, sweat) that represented different routes of exposure (ingestion, inhalation, dermal). This bioaccessibility study aimed to provide a better measure of the actual amount of these contaminants that might be absorbed into the body after exposure. The researchers found that PAHs were routinely below the limit of detection and SVOCs that have environmental regulatory limits to use for comparison were identified at levels too low to quantify. Some metals were detected but at concentrations at which health risks were low, with the exception of lead from the field sample collected. That sample indicated lead at levels in the simulated digestive fluids that the authors reported could result in blood lead levels above the current U.S. Centers for Disease Control and Prevention (CDC) reference value for blood lead in children (5 ug/dL). It should be noted that the lead concentration of the materials used in this study included a sample of turf fiber with a lead concentration of 4,400 mg/kg. Based on the lead result from this one field sample, the authors suggested that components of artificial turf fields should be certified for low or no lead content prior to use. Overall, however, the authors concluded that opportunities for exposure to constituents in these fluids presented very low risk among all populations that would use artificial turf fields

(Pavilonis et al. 2014). Based on information you provided, it is our understanding that Concord will require artificial turf that will be installed to meet the Consumer Product Safety Improvement Act (CPSIA) limit of 100 mg/kg for lead in children's products and thus would be consistent with these recommendations.

A study conducted in 2010 in the Netherlands assessed the exposure of soccer players to PAHs after playing sports on a rubber crumb field. Urine testing in participants indicated that uptake of PAHs by the participants following exposure to artificial turf with rubber crumb infill was minimal. If there is any exposure, the authors reported, uptake is minimal and within the normal range of uptake of PAHs from environmental sources and/or diet observed in healthy individuals (van Rooij and Jongeneelen 2010).

It is probably worthwhile to also note that MDPH/BEH reviewed testing data for artificial turf for the Town of Needham, as reported in our letters of 2011 and 2013 to the Needham Board of Health. The Town of Needham contracted with an environmental testing firm to conduct environmental tests including, air measurements of volatile organic compounds taken in the laboratory and heavy metals (arsenic, cadmium, chromium, lead, mercury, selenium, zinc) content of crumb rubber materials. Our review and conclusions for that testing, did not indicate exposures of health concern.

Concerns About Cancer Among Soccer Players

As noted earlier in this letter, some recent news reports suggested that the incidence of cancers among soccer players, particularly goaltenders exposed to artificial turf, might be atypical. These media reports included many cancer types, but some focused specifically on NHL, Hodgkin Lymphoma, and osteosarcoma. We thought it would be helpful to provide additional information on cancers in general and known risk factors for NHL, Hodgkin Lymphoma, and osteosarcoma.

Cancer in General

Understanding that cancer is not one disease, but a group of diseases, is very important. Research has shown that there are more than 100 different types of cancer, each with separate causes, risk factors, characteristics and patterns of survival. A risk factor is anything that increases a person's chance of developing cancer and can include hereditary conditions, medical conditions or treatments, infections, lifestyle factors, or environmental exposures. Although risk factors can influence the development of cancer, most do not directly cause cancer. An individual's risk for developing cancer may change over time due to many factors and it is likely that multiple risk factors influence the development of most cancers. In addition, an individual's risk may depend on a complex interaction between their genetic make-up and exposure to environmental agents, including infectious agents and/or chemicals. This may explain why some individuals have a fairly low risk of developing a particular type of cancer as a result of an environmental exposure, while others are more vulnerable.

Cancers in general have long latency or development periods that can range from 10 to 30 years in adults, particularly for solid tumors. In some cases, the latency period may be more than 40 to 50 years. It is important to note, however, that latency periods for children and adolescents are significantly shorter than for adults.

Hodgkin Lymphoma

Hodgkin Lymphoma is most common in young adults between the ages of 15 and 40, especially in individuals in their 20s. Among adolescents, it is the most common type of cancer.

Hodgkin Lymphoma occurs specifically in a type of B lymphocyte (or white blood cell) called the Reed-Sternberg cell while other lymphomas (non-Hodgkin's types) occur in different cells.

Established risk factors for Hodgkin Lymphoma include: exposure to the Epstein-Barr virus (EBV); a previous diagnosis of mononucleosis (mono is caused by the EBV); family history; and certain hereditary conditions (such as ataxia telangiectasia) associated with a weakened immune system. The Epstein-Barr virus is very prevalent in the general population. Even though most of us have been exposed to the virus (which remains latent in our bodies), most people do not develop mononucleosis or Hodgkin Lymphoma. EBV is thought to account for about 20% or 25% of the diagnoses of classical Hodgkin's in the US.

Higher socioeconomic status is also a possible risk factor. This is thought to be due to delayed infectious exposures in childhood.

Occupational exposures as risk factors have been studied extensively and none have emerged as established risk factors. Likewise, there is very little evidence linking the risk of Hodgkin Lymphoma to an environmental exposure, other than the EBV.

Non-Hodgkin Lymphoma (NHL)

NHL refers to a diverse group of cancers that are characterized by an increase in malignant cells of the immune system. Each subtype of NHL may have different risk factors associated with its development. The specific cause of NHL in most individuals is unknown.

Although some types of NHL are among the more common childhood cancers, more than 95% of diagnoses occur in adults. Incidence generally increases with age, and most diagnoses occur in people in their 60s or older.

Established risk factors for NHL include a weakened immune system, associated with various medical conditions, and exposure to various viruses. An increased risk is faced by individuals taking immunosuppressant drugs following organ transplants; individuals with autoimmune disorders, such as rheumatoid arthritis and lupus; and individuals who

have taken certain chemotherapy drugs for other cancers. Several viruses have been shown to play a role in the development of NHL, including the human immunodeficiency virus (HIV), the human T-cell leukemia/lymphoma virus (HTLV-1), and the Epstein-Barr virus.

Exposure to high-dose radiation (for example, by survivors of atomic bombs and nuclear reactor accidents and possibly by patients who have received radiation therapy for a previous cancer) may pose an increased risk. Some studies have also suggested that exposure to chemicals such as benzene and certain herbicides and insecticides may be linked with an increased risk of NHL. Smoking has been associated in some studies with certain types of NHL.

Osteosarcoma

Osteosarcoma is a type of malignant bone cancer which accounts for about 2% of childhood cancers in the United States. It is the most common type of cancer that develops in bone and comprises about 66% of malignant bone tumors in children in Massachusetts. Most osteosarcomas occur in children and young adults between the ages of 10 and 30. Teenagers comprise the most commonly affected age group and are at the highest risk during their growth spurt. However, osteosarcoma can occur in people of any age, with about 10% of all osteosarcomas occurring in people over the age of 60.

Established risk factors for osteosarcoma include certain inherited syndromes (such as retinoblastoma, the Li-Fraumeni syndrome, and others) and certain bone diseases (such as Paget disease of the bone and hereditary multiple osteochondromas). Individuals with these syndromes and bone diseases have an increased risk of developing osteosarcoma. People who have received radiation treatment for a previous cancer may have a higher risk of later developing osteosarcoma in the area that was treated. Being treated at a younger age and with higher doses of radiation both increase the risk. Because the risk of osteosarcoma is highest between the ages of 10 and 30, especially during the teenage growth spurt, experts believe that there may be a link between rapid bone growth and the risk of a bone tumor. Children with osteosarcoma are often tall for their age, which supports the link with rapid bone growth. Other than radiation, there are no known lifestyle or environmental risk factors associated with osteosarcoma. Aside from these risk factors, the causes of most osteosarcomas are unknown.

In summary, the scientific literature continues to suggest that exposure opportunities to artificial turf fields are not generally expected to result in health effects. Use of artificial turf materials that meet CPSIA limits for lead content in children's products would minimize exposure opportunities to lead.

With respect to your report that Concord will require some testing of the artificial turf materials in the future, we would be happy to assist you and the Town of Concord in

developing a sampling and analysis plan as well as provide technical support in interpreting results, similar to the assistance that we provided to the Town of Needham.

As we stated in previous letters to municipalities on artificial turf, while available information does not indicate exposure opportunities of health concern, MDPH/BEH continues to recommend common sense ways to minimize any potential exposure to chemicals that may be contained in synthetic turf fields made of crumb rubber. MDPH/BEH suggests washing hands after playing on the field and before eating, particularly for younger children with frequent hand-to-mouth activity, and taking off shoes before entering the house to prevent tracking in any crumb rubber particles. Also, there are studies that indicate heat levels on artificial turf fields may rise as outdoor temperatures increase (New York State 2009). Thus, for protection of the players, MDPH/BEH recommends increasing hydration, taking frequent breaks, and watering down the field to cool it on hot days to prevent the potential for burns or heat stress. Finally, based on recent work in California, MDPH/BEH recommends that steps be taken to minimize the potential for skin abrasions (e.g., protective equipment) and that skin abrasions be treated promptly to prevent potential infections.

We hope this information is helpful to you and Concord residents. If you have any questions, please feel free to contact us at 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

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Frequently Asked Questions
Artificial Turf Fields

1. What are artificial turf fields (ATFs)?

Artificial turf fields (ATFs) are synthetic alternatives to natural grass fields.

2. What are ATFs composed of?

Components of ATFs include artificial grass fibers (blades), crumb rubber infill, and sand infill overlaid on a carpet-like backing that holds the turf together. The grass fibers are typically made of nylon, polyethylene, or polypropylene, and the crumb rubber infill used to soften the surface is most often made of recycled tires.

3. Are chemicals present in ATF components?

Yes, ATF components, such as crumb rubber infill, have been found to contain chemicals including semi-volatile organic compounds (including polyaromatic hydrocarbons, or PAHs), volatile organic compounds (VOCs), and metals.

4. Have studies been done to determine if ATFs impact health?

Several studies evaluating potential exposure opportunities to constituents in ATFs have been conducted by state (e.g., California, New York, New Jersey, Connecticut) and federal agencies (e.g., U.S. Environmental Protection Agency), as well as academic researchers (e.g., Rutgers Robert Wood Johnson Medical Center).

5. How have these studies evaluated exposure opportunities at ATFs?

The studies that have been conducted measured concentrations of chemicals in the air above ATFs as well as in the components of the ATFs. In addition, some studies have evaluated the potential for these chemicals to actually enter the body and reach a susceptible organ (e.g., bioavailability studies).

6. How do public health agencies evaluate whether exposure can result in health effects?

Public health agencies evaluate concentrations measured in studies and compare them to well-established, health-based standards or guidelines (developed through comprehensive research by federal or state governments) or they conduct evaluations using standard risk assessment methods to estimate health risks from environmental exposures.

7. What is a risk assessment?

The term “risk assessment” refers to a process of assessing and evaluating the potential health effects that may result from an environmental exposure. Risk assessments take into consideration information about the toxicity of a contaminant, the estimated amount of contaminant that someone may be exposed to, the sensitivity of an individual to the contaminant (e.g., children are generally more sensitive to environmental contaminants than healthy adults), and other factors.

8. What assumptions have been used in risk assessments done for ATFs?

Exposure assumptions that have been used include assuming someone plays on the field for 3-5 hours a day, 4-5 days a week, 8-12 months a year, and 12 (child) to 30 years (adult). Such assumptions are designed to be conservative and consider worst-case scenarios.

9. What do the available studies that have been conducted on exposure opportunities to ATFs and health impacts show?

Although exhaustive research has not been completed, the available studies have shown that although ATF components contain chemicals in the material itself, exposure opportunities at levels measured do not suggest that health effects are likely.

10. What are the findings of studies that evaluated exposure opportunities based on measurements of constituents (e.g., in air, dust) at ATFs?

Results of samples taken at or above (e.g., air) ATFs and analyzed for VOCs, SVOCs, metals, and particulate matter that can be inhaled into the lungs suggested that adverse health effects were unlikely to occur. These include studies conducted by the Connecticut Health Department, the New York State Health Department, and the California Office of Environmental Health Hazard and Assessment.

11. What are the findings of studies that have evaluated ingestion or inhalation of, and/or skin contact with constituents in ATFs?

The Rutgers study evaluated whether exposures to SVOCs or metals in ATF components might suggest exposures of health concern via ingestion, inhalation, or

dermal contact. They concluded that overall the opportunities for exposure to constituents in these fields presented very low risk among all populations that would use ATFs. Authors of a study in the Netherlands reported that results of urine testing indicted that uptake of PAHs among participants, following playing on an ATF with crumb rubber infill, was minimal.

12. What were the findings of the Rutgers study with respect to lead?

The Rutgers researchers found that lead concentrations in one of seven ATFs tested could potentially result in blood lead levels above the U.S. Centers for Disease Control and Prevention reference value for blood lead in young children (5 ug/dL). It should be noted, however, that the lead concentration in the materials used in this study included a sample of turf fiber with a lead concentration of 4,400 mg/kg, well above the US Consumer Product Safety and Improvement Act limit for lead content in children's products of 100 mg/kg.

13. Do all ATFs have lead?

No. Some ATFs are constructed with components that are certified as having no or low lead content. Use of ATF components that meet the Consumer Product Safety and Improvement Act limit of 100 ppm for lead in children's products would minimize exposure opportunities to lead.

14. What are the findings of studies that evaluated exposures to bacteria?

The California Office of Environmental Health Hazard and Assessment tested for bacterial contamination at both natural grass fields and ATFs. They found fewer bacteria detected on artificial turf compared to natural turf, and therefore less likely to result in infection risks to athletes using ATFs that may have skin abrasions.

15. Have epidemiological studies been conducted to determine if ATF exposures are associated with the occurrence of cancer in children?

Some recent media reports have raised concerns about the possible association between playing on ATFs and the development of cancers. It is important to note that the types of cancers reported are among those that have been more prevalent in children for many years. To date, no epidemiologic studies have evaluated the occurrence of cancer among athletes or others who play on ATFs.

16. How common is it for children to get cancer?

Although cancer is much less common among children than older adults, unfortunately 1 in 285 children in the U.S. will be diagnosed with cancer before the age of 20. Leukemia is the most common cancer diagnosed in children and teens, accounting for almost 1 out of 3 cancers in this age group. From 1975 to 2010, the overall incidence of pediatric cancer in the U.S. increased slightly, by an average of 0.6 percent per year.

17. Has the potential for the development of cancer been assessed using standard risk assessment methods for exposure opportunities associated with ATFs?

Several studies, including those conducted by officials in New York City, New York State, Connecticut, California, the U.S. Environmental Protection Agency, and Norway, have conducted cancer risk assessments based on opportunities for exposures at ATFs. These evaluations were based on testing results from different kinds of fields under a variety of weather and use conditions. These risk assessment studies all indicate that the use of ATFs is not associated with elevated cancer risk.

18. Does MDPH endorse the use of ATFs?

No, MDPH does not endorse any particular consumer product, including ATFs. MDPH routinely evaluates whether exposure opportunities to constituents in consumer products may pose health concerns and provides information to put risk in perspective.

19. What other exposure concerns have been raised about ATFs?

Concerns have been expressed in relation to the increased temperature of fields as outdoor temperatures rise. For these reasons, fields may be frequently watered to cool the surface, and athletes should increase hydration and take frequent breaks to reduce the potential for burns or heat stress.

20. Are there steps that can be taken to reduce exposure opportunities to ATF components?

Yes. MDPH recommends common sense steps to minimize potential exposures to chemicals that may be present, such as washing hands after playing on a field and before eating (particularly for younger children with frequent hand-to-mouth activity) and taking off shoes before entering the house to prevent tracking in any crumb rubber particles.

21. Who should I contact for more information?

If you have any questions about ATFs and health, you may contact the following:

Environmental Toxicology Program
Bureau of Environmental Health
Massachusetts Department of Public Health
250 Washington Street, 7th Floor
Boston, MA 02108
617-624-5757

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
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March 23, 2015

Stephanie Bacon, Health Agent
Office of Board of Health
155 Village Street
Medway, MA 02053

Dear Ms. Bacon:

Thank you for your letter of February 24, 2015, in which you requested that the Massachusetts Department of Public Health, Bureau of Environmental Health (MDPH/BEH), evaluate health concerns related to the use of crumb rubber infill material for artificial turf fields in Medway, Massachusetts. As you are likely aware, our office had previously evaluated this issue in a series of letters to the Town of Needham Board of Health in 2008, 2011, and 2013.

In response, MDPH/BEH staff have evaluated more recent information on potential exposure opportunities to artificial turf components, including crumb rubber infill, and evaluated health concerns, including cancer, in relation to exposure to such turf. Recent media reports on soccer players, particularly goalies that have played on artificial turf, and the incidence of some cancers have been expressed. These reports raised concerns about the possible association between playing on crumb rubber fields and the development of cancers, notably, non-Hodgkin's lymphoma, Hodgkin Lymphoma, and osteosarcoma. We also evaluated information you provided on the content of the specific products used in Medway. Our review is summarized below.

Updated Literature Review

Our previous evaluations noted that crumb rubber infill has been found to contain chemicals, including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and metals. We further stated that although these chemicals are in the material itself, information available at that time did not suggest significant exposure opportunities to the chemicals in the materials such that we would expect health effects. We noted that the most relevant study on this topic at the time was a study conducted by the California Office of Environmental Health Hazard Assessment (CA OEHHA).

Since that time, the CA OEHHA conducted additional evaluations of chemical concentrations in air above crumb rubber turf fields under active use (CA OEHHA 2010). Air samples were taken above fields and analyzed for VOCs and metals. Results suggested that adverse health effects were unlikely to occur from inhalation of VOCs or metals in particulates above these fields. To assess the potential for skin infections due to bacteria or to skin abrasions on these fields, tests for bacterial contamination were performed and the frequency of skin abrasions was assessed. Researchers found fewer bacteria detected on the artificial turf compared to natural turf, suggesting that the risk of infection to athletes using these fields was actually lower. However, more skin abrasions were observed in athletes using artificial turf fields than natural turf fields, and the study authors made various recommendations to help prevent skin abrasions (e.g., protective equipment or clothing) and prompt treatment of skin abrasions.

In another study, the state of Connecticut conducted air sampling at four outdoor artificial turf fields with crumb rubber infills (most relevant to Medway) under summer conditions (Simcox et al. 2011). Air measurements were taken using stationary air sampling monitoring devices as well as personal samplers (placed on people using the fields). They concluded that exposure opportunities to turf contaminants were not associated with elevated health risks and suggested that their findings were consistent with other studies available at the time. A letter prepared by the Connecticut Department of Public Health reiterates these conclusions (CTDPH 2015).

A 2014 study by researchers at the Rutgers Robert Wood Johnson Medical School in New Jersey evaluated opportunities for exposures to PAHs, semivolatile organic compounds (SVOCs), and heavy metals from exposures to artificial turf fibers and crumb rubber infills by measuring these constituents in simulated body fluids (digestive fluids, lung fluids, sweat) that represented different routes of exposure (ingestion, inhalation, dermal). This bioaccessibility study aimed to provide a better measure of the actual amount of these contaminants that might be absorbed into the body after exposure. The researchers found that PAHs were routinely below the limit of detection and SVOCs that have environmental regulatory limits to use for comparison were identified at levels too low to quantify. Some metals were detected but at concentrations at which health risks were low, with the exception of lead from the field sample collected. That sample indicated lead at levels in the simulated digestive fluids that the authors reported could result in blood lead levels above the current U.S. Centers for Disease Control and Prevention (CDC) reference value for blood lead in children (5 ug/dL). It should be noted that the lead concentration of the materials used in this study included a sample of turf fiber with a lead concentration of 4,400 mg/kg. This level contrasts with information on the Medway artificial turf components, which reportedly either contained lead at 39 mg/kg (crumb rubber infill) or had no lead (turf fibers) (see discussion later in this letter). Based on the lead result from this one field sample, the authors suggested that components of artificial turf fields should be certified for low or no lead content prior to use. Overall, however, the authors concluded that opportunities

for exposure to constituents in these fluids presented very low risk among all populations that would use artificial turf fields (Pavilonis et al. 2014).

A study conducted in 2010 in the Netherlands assessed the exposure of soccer players to PAHs after playing sports on a rubber crumb field. Urine testing in participants indicated that uptake of PAHs by the participants following exposure to artificial turf with rubber crumb infill was minimal. If there is any exposure, the authors reported, uptake is minimal and within the normal range of uptake of PAHs from environmental sources and/or diet observed in healthy individuals (van Rooij and Jongeneelen 2010).

It is probably worthwhile to also note that MDPH/BEH reviewed testing data for artificial turf for the Town of Needham, as reported in our letters of 2011 and 2013 to the Needham Board of Health. The Town of Needham contracted with an environmental testing firm to conduct environmental tests including, air measurements of volatile organic compounds taken in the laboratory and heavy metals (arsenic, cadmium, chromium, lead, mercury, selenium, zinc) content of crumb rubber materials. Our review and conclusions for that testing, did not indicate exposures of health concern.

Material in Medway

MDPH/BEH reviewed available information provided by the Medway Board of Health regarding the specific materials used in the Medway fields. These included the APT Gridiron turf system and Liberty Tire Recycling 10+20 BM Rubber Crumb Brantford, ON. Among the materials provided for these products were statements or test results for various constituents in these products.

APT submitted a written statement dated October 29, 2014, that reported that the APT Gridiron turf systems (essentially the grass fibers of the artificial turf) are manufactured and installed without the use of any lead or heavy metals. They reported that this included all materials used for the turf fibers and backings. No other documentation about this product, including any testing results, was provided to support this statement.

With respect to the 10+20 BM Crumb Rubber infill product, laboratory testing results were provided for this product, although it is not clear whether the testing was for the materials specifically used in turf applied in Medway. Testing was conducted for metals content as well as emissions of volatile organic compounds (VOCs). It appears that testing included the following: (1) testing for VOCs emitted into a confined air space in the laboratory after heating the product to 73 degrees F; and (2) content testing for eight heavy metals, including lead. The laboratory compared results to criteria established by the Greenguard certification program, part of Underwriters Laboratory, that uses among its criteria for certification health-based levels derived by the CA OEHHA.

Testing results for metals content of the product indicated a lead concentration of 39 mg/kg, which is less than the current Consumer Product Safety Improvement Act (CPSIA) limit of 100 mg/kg for lead in children's products (Ulirsch et al. 2010). No other metals were detected.

Test results measuring emissions off-gassing from heated material were provided in measurements that cannot be compared to any health-based standards or guidelines and thus, MDPH/BEH did not further evaluate this information. Typically, when certain products raise health concerns, health agencies review Material Safety Data Sheets (MSDS). An MSDS provides information on health risks associated with use of the product. An industry group, Synthetic Turf Council, provides a sample template MSDS for crumb rubber infill material (Synthetic Turf Council 2014). Although this sample MSDS is not specific to any particular product, it appears to be applicable to crumb rubber infill in general. In the section under "Hazardous Ingredients," the MSDS notes that the product can contain fine fibers that may cause irritation symptoms (e.g., itching, irritation of mucous membranes, eye irritation). The MSDS notes that the crumb rubber material is generally thought to be a nuisance dust.

Concerns About Cancer Among Soccer Players

As noted earlier in this letter, some recent news reports suggested that the incidence of cancers among soccer players, particularly goaltenders exposed to artificial turf, might be atypical. These reports included many cancer types, but some focused specifically on NHL, Hodgkin Lymphoma, and osteosarcoma in three individuals. We thought it would be helpful to provide additional information on cancers in general and known risk factors for NHL, Hodgkin Lymphoma, and osteosarcoma.

Cancer in General

Understanding that cancer is not one disease, but a group of diseases, is very important. Research has shown that there are more than 100 different types of cancer, each with separate causes, risk factors, characteristics and patterns of survival. A risk factor is anything that increases a person's chance of developing cancer and can include hereditary conditions, medical conditions or treatments, infections, lifestyle factors, or environmental exposures. Although risk factors can influence the development of cancer, most do not directly cause cancer. An individual's risk for developing cancer may change over time due to many factors and it is likely that multiple risk factors influence the development of most cancers. In addition, an individual's risk may depend on a complex interaction between their genetic make-up and exposure to environmental agents, including infectious agents and/or chemicals. This may explain why some individuals have a fairly low risk of developing a particular type of cancer as a result of an environmental exposure, while others are more vulnerable.

Cancers in general have long latency or development periods that can range from 10 to 30 years in adults, particularly for solid tumors. In some cases, the latency period may be more than 40 to 50 years. It is important to note, however, that latency periods for children and adolescents are significantly shorter than for adults.

Hodgkin Lymphoma

Hodgkin Lymphoma is most common in young adults between the ages of 15 and 40, especially in individuals in their 20s. Among adolescents, it is the most common type of cancer.

Hodgkin Lymphoma occurs specifically in a type of B lymphocyte (or white blood cell) called the Reed-Sternberg cell while other lymphomas (non-Hodgkin's types) occur in different cells.

Established risk factors for Hodgkin Lymphoma include: exposure to the Epstein-Barr virus (EBV); a previous diagnosis of mononucleosis (mono is caused by the EBV); family history; and certain hereditary conditions (such as ataxia telangiectasia) associated with a weakened immune system. The Epstein-Barr virus is very prevalent in the general population. Even though most of us have been exposed to the virus (which remains latent in our bodies), most people do not develop mononucleosis or Hodgkin Lymphoma. EBV is thought to account for about 20% or 25% of the diagnoses of classical Hodgkin's in the US.

Higher socioeconomic status is also a possible risk factor. This is thought to be due to delayed infectious exposures in childhood.

Occupational exposures as risk factors have been studied extensively and none have emerged as established risk factors. Likewise, there is very little evidence linking the risk of Hodgkin Lymphoma to an environmental exposure, other than the EBV.

Non-Hodgkin Lymphoma (NHL)

NHL refers to a diverse group of cancers that are characterized by an increase in malignant cells of the immune system. Each subtype of NHL may have different risk factors associated with its development. The specific cause of NHL in most individuals is unknown.

Although some types of NHL are among the more common childhood cancers, more than 95% of diagnoses occur in adults. Incidence generally increases with age, and most diagnoses occur in people in their 60s or older.

Established risk factors for NHL include a weakened immune system, associated with various medical conditions, and exposure to various viruses. An increased risk is faced by individuals taking immunosuppressant drugs following organ transplants; individuals with autoimmune disorders, such as rheumatoid arthritis and lupus; and individuals who have taken certain chemotherapy drugs for other cancers. Several viruses have been shown to play a role in the development of NHL, including the human immunodeficiency virus (HIV), the human T-cell leukemia/lymphoma virus (HTLV-1), and the Epstein-Barr virus.

Exposure to high-dose radiation (for example, by survivors of atomic bombs and nuclear reactor accidents and possibly by patients who have received radiation therapy for a previous cancer) may pose an increased risk. Some studies have also suggested that exposure to chemicals such as benzene and certain herbicides and insecticides may be linked with an increased risk of NHL. Smoking has been associated in some studies with certain types of NHL.

Osteosarcoma

Osteosarcoma is a type of malignant bone cancer which accounts for about 2% of childhood cancers in the United States. It is the most common type of cancer that develops in bone and comprises about 66% of malignant bone tumors in children in Massachusetts. Most osteosarcomas occur in children and young adults between the ages of 10 and 30. Teenagers comprise the most commonly affected age group and are at the highest risk during their growth spurt. However, osteosarcoma can occur in people of any age, with about 10% of all osteosarcomas occurring in people over the age of 60.

Established risk factors for osteosarcoma include certain inherited syndromes (such as retinoblastoma, the Li-Fraumeni syndrome, and others) and certain bone diseases (such as Paget disease of the bone and hereditary multiple osteochondromas). Individuals with these syndromes and bone diseases have an increased risk of developing osteosarcoma. People who have received radiation treatment for a previous cancer may have a higher risk of later developing osteosarcoma in the area that was treated. Being treated at a younger age and with higher doses of radiation both increase the risk. Because the risk of osteosarcoma is highest between the ages of 10 and 30, especially during the teenage growth spurt, experts believe that there may be a link between rapid bone growth and the risk of a bone tumor. Children with osteosarcoma are often tall for their age, which supports the link with rapid bone growth. Other than radiation, there are no known lifestyle or environmental risk factors associated with osteosarcoma. Asides from these risk factors, the causes of most osteosarcomas are unknown.

Summary

In summary, the scientific literature continues to suggest that exposure opportunities to artificial turf fields are not generally expected to result in health effects. Testing results on the crumb rubber infill indicated lead content less than CPSIA statutory limits established for children's products. For the turf fibers, APT provided a statement that this material did not have lead used in its manufacture, but no additional documentation was provided.

With respect to cancer concerns reported in media stories, it is important to note that the reports of cancers were of a wide variety of different types, each with its own set of risk factors. In addition, our staff reviewed cancer incidence data for the Town of Medway. The Massachusetts Cancer Registry (MCR) is a population-based surveillance

system that began collecting information in 1982 on Massachusetts residents diagnosed with cancer in the state. All newly diagnosed cancer cases among Massachusetts residents are required by law to be reported to the MCR within six months of the date of diagnosis (MGL, c.111, s.111B). This information is kept in a confidential database and reviewed for accuracy and completeness.

Available information on the occurrence of cancers in children living in Medway indicates no diagnoses of Hodgkin Lymphoma, NHL, or osteosarcoma have been reported to the MCR in a search of their files from 2006 to the present. Although it is possible that a very recent diagnosis may not yet have been reported to the MCR, the fact that there are no reports of such cancers is reassuring.

Although available resources cannot support MDPH conducting environmental testing of this material, we would be happy to assist the Town of Medway in developing a sampling and analysis plan as well as provide technical support in interpreting results, similar to the assistance that we provided to the Town of Needham.

As we stated in our letters to Needham officials, while available information does not indicate exposure opportunities of health concern, MDPH/BEH continues to recommend common sense ways to minimize any potential exposure to chemicals that may be contained in synthetic turf fields made of crumb rubber. MDPH/BEH suggests washing hands after playing on the field and before eating, particularly for younger children with frequent hand-to-mouth activity, and taking off shoes before entering the house to prevent tracking in any crumb rubber particles. Also, there are studies that indicate heat levels on artificial turf fields may rise as outdoor temperatures increase (New York State 2009). Thus, for protection of the players, MDPH/BEH recommends increasing hydration, taking frequent breaks, and watering down the field to cool it on hot days to prevent the potential for burns or heat stress. Finally, based on recent work in California, MDPH/BEH recommends that steps be taken to minimize the potential for skin abrasions (e.g., protective equipment) and that skin abrasions be treated promptly to prevent potential infections.

We hope this information is helpful to you and Medway residents. If you have any questions, please feel free to contact us at 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

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Simcox, NJ; A Bracker; G. Ginsberg; B Toal; B. Golemblewski; T. Kurland; and C. Hedman. 2011. Synthetic Turf Field Investigation in Connecticut. J Tox Environ Health, Part A: 74(17):1133-1149.

Synthetic Turf Council. 2014. Guidelines for Crumb Rubber Infill Used in Synthetic Turf Fields. Printed October 2010, Revised October 23, 2014. Atlanta, GA.

Ulirsch, G; K Gleason; S. Gerstenberger; D Moffett; G. Pulliam, T ahmed; and J. Fagliano. 2010. Evaluating and Regulating Lead in Synthetic Turf. Environ. Health Perspect., 118:1345-1349.

von Rooij, DJ, and PJ Jorgeneelen. 2010. Hydroxypyrene in urine of football players after playing on artificial sports field with the crumb rubber infill. Int Arch Occup Environ Health, 83(1):105-110. DOI: 10.1007/s00420-009-0465-y.

CPSC Staff Finds Synthetic Turf Fields OK to Install, OK to Play On

44

Release date: July 30, 2008

Release number: 08-348

Release Details

The U.S. Consumer Product Safety Commission (CPSC) staff today released its evaluation (pdf) of various synthetic athletic fields. The evaluation concludes that young children are not at risk from exposure to lead in these fields.

CPSC staff evaluation showed that newer fields had no lead or generally had the lowest lead levels. Although small amounts of lead were detected on the surface of some older fields, none of these tested fields released amounts of lead that would be harmful to children.

Lead is present in the pigments of some synthetic turf products to give the turf its various colors. Staff recognizes that some conditions such as age, weathering, exposure to sunlight, and wear and tear might change the amount of lead that could be released from the turf. As turf is used during athletics or play and exposed

over time to sunlight, heat and other weather conditions, the surface of the turf may start to become worn and small particles of the lead-containing synthetic grass fibers might be released. The staff considered in the evaluation that particles on a child's hand transferred to his/her mouth would be the most likely route of exposure and determined young children would not be at risk.

Although this evaluation found no harmful lead levels, CPSC staff is asking that voluntary standards be developed for synthetic turf to preclude the use of lead in future products. This action is being taken proactively to address any future production of synthetic turf and to set a standard for any new entrants to the market to follow.

As an overall guideline, CPSC staff recommends young children wash their hands after playing outside, especially before eating.

ANALYTICAL INDUSTRIAL RESEARCH LABORATORIES, INC.

State of Tennessee (ID #02034)

Alabama Dept. of Environmental Management (ID #40780)

IS NOW
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1550 37TH ST., NE
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423.476.7766 FAX: 423.476.7714

Scope of Accreditation:
Wastewater, Surface Water, Ground Water, Drinking Water, Solids, Hazardous Waste, Soils, Sediments, and Sludges.

Lab Report 282043

8609
Shaw Sports Turf/Dalton
Attention: Phil Stricklen
1010 V.D. Parrot Parkway
Dalton, GA 30720

Date Received 7 /21/2015
Date Sampled None Given
Date Requested 7 /31/2015
Rush Status Normal
Phone (706) 532-2150
Extension
☐ ***Fax*** (706) 331-5407
☑ ***eMail:*** phil.stricklen
PO#

Sample Information

Shaw HP Slit Tape
Turf Yarn

Lab Report: 282043	***Result***		***LCL***	***Method***	***SDL***	***Date***	***Time***	***Analyst***
CAM 17 Metals								
Antimony (Sb)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Arsenic (As)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Barium (Ba)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Beryllium (Be)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Cadmium (Cd)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Chromium (Cr)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Cobalt (Co)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Copper (Cu)	3.09	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Lead (Pb)	5.40	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Molybdenum (Mo)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Nickel (Ni)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Selenium (Se)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Silver (Ag)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Thallium (Tl)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Vanadium (V)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Zinc (Zn)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:29	JAG
Mercury (Hg)	< 0.1	mg/Kg	0.1	EPA 7471B	0.1	8/4/2015	15:15	JAG

Lowest Calibration Level [LCL] - reporting limit; Sample Detection Level [SDL] - Sample Specific

QA/QC Procedures required by the Method(s) were followed unless otherwise noted. Performance and acceptance standards for required QA/QC procedures were achieved unless otherwise noted. No significant modifications have been made to the Method(s). I attest that, based upon my inquiry of those individuals immediately responsible for reviewing the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Report approved by: Roy B Patterson TECHNICAL DIRECTOR

NEWS from CPSC

U.S. Consumer Product Safety Commission

Office of Information and Public Affairs Washington, DC 20207

FOR IMMEDIATE RELEASE
July 30, 2008
Release #08-348

CPSC Hotline: (800) 638-2772
CPSC Media Contacts: (301) 504-7908

CPSC Staff Finds Synthetic Turf Fields OK to Install, OK to Play On

WASHINGTON, D.C. - The U.S. Consumer Product Safety Commission (CPSC) staff today released its evaluation of various synthetic athletic fields. The evaluation concludes that young children are not at risk from exposure to lead in these fields.

CPSC staff evaluation showed that newer fields had no lead or generally had the lowest lead levels. Although small amounts of lead were detected on the surface of some older fields, none of these tested fields released amounts of lead that would be harmful to children.

Lead is present in the pigments of some synthetic turf products to give the turf its various colors. Staff recognizes that some conditions such as age, weathering, exposure to sunlight, and wear and tear might change the amount of lead that could be released from the turf. As turf is used during athletics or play and exposed over time to sunlight, heat and other weather conditions, the surface of the turf may start to become worn and small particles of the lead-containing synthetic grass fibers might be released. The staff considered in the evaluation that particles on a child's hand transferred to his/her mouth would be the most likely route of exposure and determined young children would not be at risk.

Although this evaluation found no harmful lead levels, CPSC staff is asking that voluntary standards be developed for synthetic turf to preclude the use of lead in future products. This action is being taken proactively to address any future production of synthetic turf and to set a standard for any new entrants to the market to follow.

As an overall guideline, CPSC staff recommends young children wash their hands after playing outside, especially before eating.

A Video News Release will feature b-roll of synthetic turf in use, on-site and laboratory testing, and soundbites in English and Spanish.

Video Feed Satellite Coordinates

Wednesday, July 30, 2008
2:30 PM – 3:00PM ET
Galaxy 25
Transponder 13
C-Band
Downlink Freq: 3960V

Thursday, July 31, 2008
10:30 AM – 11:00AM ET

Galaxy 3
Transponder 21
C-Band
Downlink Freq: 4120H

For Technical Information, DURING FEED ONLY, contact Daniel Conboy at (800) 920-6397 x 221.

Send the link for this page to a friend! The U.S. Consumer Product Safety Commission is charged with protecting the public from unreasonable risks of serious injury or death from more than 15,000 types of consumer products under the agency's jurisdiction. Deaths, injuries and property damage from consumer product incidents cost the nation more than $800 billion annually. The CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. The CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed significantly to the decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

To report a dangerous product or a product-related injury, call CPSC's hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270, or visit CPSC's web site at www.cpsc.gov/talk.html. To join a CPSC email subscription list, please go to https://www.cpsc.gov/cpsclist.aspx. Consumers can obtain this release and recall information at CPSC's Web site at www.cpsc.gov.

ANALYTICAL INDUSTRIAL RESEARCH LABORATORIES, INC.

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Alabama Dept. of Environmental Management (ID #40780)

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Scope of Accreditation:
Wastewater, Surface Water, Ground Water, Drinking Water, Solids, Hazardous Waste, Soils, Sediments, and Sludges.

Lab Report 282042

8609
Shaw Sports Turf/Dalton
Attention: Phil Stricklen
1010 V.D. Parrot Parkway
Dalton, GA 30720

Date Received 7 /21/2015
Date Sampled None Given
Date Requested 7 /31/2015
Rush Status Normal
Phone (706) 532-2150
Extension
☐ ***Fax*** (706) 331-5407
☑ ***eMail:*** phil.stricklen
PO#

Sample Information

Shaw PE Monofilament
Turf Yarn

Lab Report: 282042	***Result***		***LCL***	***Method***	***SDL***	***Date***	***Time***	***Analyst***
CAM 17 Metals								
Antimony (Sb)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Arsenic (As)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Barium (Ba)	26.5	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Beryllium (Be)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Cadmium (Cd)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Chromium (Cr)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Cobalt (Co)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Copper (Cu)	2.06	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Lead (Pb)	8.77	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Molybdenum (Mo)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Nickel (Ni)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Selenium (Se)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Silver (Ag)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Thallium (Tl)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Vanadium (V)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Zinc (Zn)	12.8	mg/Kg	0.25	EPA 6010	0.25	8/5/2015	10:25	JAG
Mercury (Hg)	< 0.1	mg/Kg	0.1	EPA 7471B	0.1	8/4/2015	15:15	JAG

Lowest Calibration Level [LCL] - reporting limit; Sample Detection Level [SDL] - Sample Specific

QA/QC Procedures required by the Method(s) were followed unless otherwise noted. Performance and acceptance standards for required QA/QC procedures were achieved unless otherwise noted. No significant modifications have been made to the Method(s). I attest that, based upon my inquiry of those individuals immediately responsible for reviewing the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Report approved by: Roy G Patterson TECHNICAL DIRECTOR

ANALYTICAL INDUSTRIAL RESEARCH LABORATORIES, INC.

State of Tennessee (ID #02034)

Alabama Dept. of Environmental Management (ID #40780)

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423.476.7766 FAX: 423.476.7714

Scope of Accreditation:
Wastewater, Surface Water, Ground Water, Drinking Water, Solids, Hazardous Waste, Soils, Sediments, and Sludges.

Lab Report 282462

8609
Shaw Sports Turf/Dalton
Attention: Phil Stricklen
1010 V.D. Parrot Parkway
Dalton, GA 30720

Date Received 8 /11/2015
Date Sampled 8/10/2015
Date Requested 8 /18/2015
Rush Status ASAP
Phone (706) 532-2150
Extension
☐ *Fax* (706) 331-5407
☑ *eMail:* phil.stricklen
PO#

Sample Information

Shaw Sports Turf
Primary Backing

Lab Report: 282462	*Result*		*LCL*	*Method*	*SDL*	*Date*	*Time*	*Analyst*
PAH - SIMS								
2-Methylnaphthalene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Acenaphthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Acenaphthylene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Benzo(a)anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Benzo(a)pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Benzo(b)fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Benzo(g,h,i)perylene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Benzo(k)fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Chrysene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Dibenz(a,h)anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Fluorene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Indeno(1,2,3-cd)pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Naphthalene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Phenanthrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
Pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:11	RRP
CAM 17 Metals								
Antimony (Sb)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Arsenic (As)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Barium (Ba)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Beryllium (Be)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Cadmium (Cd)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Chromium (Cr)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Cobalt (Co)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Copper (Cu)	6.17	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Lead (Pb)	5.90	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Molybdenum (Mo)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Nickel (Ni)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Selenium (Se)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Silver (Ag)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Thallium (Tl)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Vanadium (V)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Zinc (Zn)	73.4	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:17	JAG
Mercury (Hg)	< 0.1	mg/Kg	0.1	EPA 7471B	0.1	8/26/2015	8:20	JAG
Hexavalent Chromium	< 4	mg/Kg	0.1	EPA 7196 A	4	8/11/2015	13:25	JAG

Lowest Calibration Level [LCL] - reporting limit; Sample Detection Level [SDL] - Sample Specific

QA/QC Procedures required by the Method(s) were followed unless otherwise noted. Performance and acceptance standards for required QA/QC procedures were achieved unless otherwise noted. No significant modifications have been made to the Method(s). I attest that, based upon my inquiry of those individuals immediately responsible for reviewing the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Report approved by: Roy B Patterson TECHNICAL DIRECTOR

ANALYTICAL INDUSTRIAL RESEARCH LABORATORIES, INC.

State of Tennessee (ID #02034)

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Scope of Accreditation:
Wastewater, Surface Water, Ground Water, Drinking Water, Solids, Hazardous Waste, Soils, Sediments, and Sludges.

Lab Report 282463

8609
Shaw Sports Turf/Dalton
Attention: Phil Stricklen
1010 V.D. Parrot Parkway
Dalton, GA 30720

Date Received 8 /11/2015
Date Sampled 8/10/2015
Date Requested 8 /18/2015
Rush Status ASAP
Phone (706) 532-2150
Extension
☐ *Fax* (706) 331-5407
☑ *eMail:* phil.stricklen
PO#

Sample Information

Shaw Sports Turf
Secondary Backing

Lab Report: 282463	*Result*		*LCL*	*Method*	*SDL*	*Date*	*Time*	*Analyst*
PAH - SIMS								
2-Methylnaphthalene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Acenaphthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Acenaphthylene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Benzo(a)anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Benzo(a)pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Benzo(b)fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Benzo(g,h,i)perylene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Benzo(k)fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Chrysene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Dibenz(a,h)anthracene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Fluoranthene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Fluorene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Indeno(1,2,3-cd)pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Naphthalene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Phenanthrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
Pyrene	< 10	ug/L	10	8270C SIMS	10	8/22/2015	17:52	RRP
CAM 17 Metals								
Antimony (Sb)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Arsenic (As)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Barium (Ba)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Beryllium (Be)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Cadmium (Cd)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Chromium (Cr)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Cobalt (Co)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Copper (Cu)	3.37	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Lead (Pb)	11.9	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Molybdenum (Mo)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Nickel (Ni)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Selenium (Se)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Silver (Ag)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Thallium (Tl)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Vanadium (V)	< 0.25	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Zinc (Zn)	24.4	mg/Kg	0.25	EPA 6010	0.25	8/26/2015	16:20	JAG
Mercury (Hg)	< 0.1	mg/Kg	0.1	EPA 7471B	0.1	8/26/2015	8:20	JAG
Hexavalent Chromium	< 4	mg/Kg	0.1	EPA 7196 A	4	8/11/2015	13:25	JAG

Lowest Calibration Level [LCL] - reporting limit; Sample Detection Level [SDL] - Sample Specific

QA/QC Procedures required by the Method(s) were followed unless otherwise noted. Performance and acceptance standards for required QA/QC procedures were achieved unless otherwise noted. No significant modifications have been made to the Method(s). I attest that, based upon my inquiry of those individuals immediately responsible for reviewing the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Report approved by: Roy B Patterson TECHNICAL DIRECTOR

Material Safety Data Sheet

Material Name: PowerBlade HP Monofilament

* * * Section 1 - Chemical Product and Company Identification * * *

Manufacturer Information

Shaw Industries Inc.
900 V.D. Parrott Jr. Parkway
Dalton, GA 30722-2128

Phone: 706.275.2910

Emergency # ChemTel 1-800-535-5053

* * * Section 2 - Hazards Identification * * *

Emergency Overview

No hazards anticipated during normal product handling conditions. Dusts may cause eye, skin and respiratory tract irritation.

Potential Health Effects: Eyes

Dusts may cause eye irritation.

Potential Health Effects: Skin

Dusts may cause skin irritation.

Potential Health Effects: Ingestion

Not a likely route of exposure under normal product use conditions. May cause gastrointestinal irritation if ingested.

Potential Health Effects: Inhalation

Dusts may cause respiratory tract irritation.

HMIS Ratings: Health: 1 **Fire:** 0 **HMIS Reactivity** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
Not Available	Polyethylene Resin	91
Not Available	Concentrate	8
Not Available	Process Aide	1

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.

First Aid: Skin

For skin contact, flush with large amounts of water. If irritation persists, get medical attention.

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

First Aid: Inhalation

Move person to non-contaminated air. If the affected person is not breathing, apply artificial respiration.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

May burn, but does not readily ignite. As with other organic dusts, fine particles of this material may create a combustible atmosphere if suspended in air.

Hazardous Combustion Products

Irritating and toxic gases or fumes may be released during a fire.

Extinguishing Media

Use dry chemical, CO2, water spray or foam.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

NFPA Ratings: Health: 1 **Fire:** 0 **Reactivity:** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

No special containment needed.

Clean-Up Procedures

Sweep up or gather material and place in appropriate container. Avoid dust generation.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Avoid dust generation when handling.

Storage Procedures

Keep away from heat, sparks or other ignition sources

* * * Section 8 - Exposure Controls / Personal Protection * * *

A: Component Exposure Limits

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

Engineering Controls

Use local exhaust ventilation to keep airborne dust levels to a minimum.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Use safety glasses with side shields when dusts are generated.

Personal Protective Equipment: Skin

Wear suitable protective clothing to minimize skin contact.

Personal Protective Equipment: Respiratory

If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

Personal Protective Equipment: General

Eye wash fountain is recommended.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Green Fiber	**Odor:**	Slight
Physical State:	Solid	**pH:**	NA
Vapor Pressure:	ND	**Vapor Density:**	ND
Boiling Point:	ND	**Melting Point:**	ND
Solubility (H2O):	ND	**Specific Gravity:**	ND
Evaporation Rate:	ND	**VOC:**	ND
Octanol/H2O Coeff.:	ND	**Flash Point:**	ND
Flash Point Method:	ND	**Upper Flammability Limit (UFL):**	ND
Lower Flammability Limit (LFL):	ND	**Burning Rate:**	ND
Auto Ignition:	ND		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

Heat, flames and other ignition sources.

Incompatibility

May react with strong oxidizing agents.

Hazardous Decomposition

Irritating and toxic gases or fumes may be released during a fire.

Possibility of Hazardous Reactions

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Dose Effects

A: General Product Information

May cause eye, skin and respiratory tract irritation.

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

Carcinogenicity

A: General Product Information

No information available for the product.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

All wastes must be handled in accordance with local, state and federal regulations.

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

* * * Section 14 - Transportation Information * * *

US DOT Information

Shipping Name: Not Regulated

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

State Regulations

Component Analysis - State

None of this product's components are listed on the state lists from CA, MA, MN, NJ, PA, or RI.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

* * * Section 16 - Other Information * * *

Other Information

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

shaw™
SPORTS TURF

To Whom It May Concern:

The safety of our synthetic turf products is a priority for Shaw Sports Turf. All turf products are thoroughly tested before they are approved to be sold to the public. This testing not only includes physical and performance testing to show that the product will perform as desired for the athlete, but also testing is done to assure our products are safe from environmental and human health aspects.

A recent concern for synthetic turf has been the total lead content in the synthetic turf fibers. All of the fibers used in Shaw Sports Turf have been tested according to ASTM F 2765 and have shown total lead levels well below the 100 ppm requirement. Although synthetic turf is not classified by the CPSC as a children's product, the 100 ppm maximum level meets the most stringent requirement the CPSC has established for lead in products designed for children.

Other concerns focus on what can be extracted into the environment by rain water or heating of the turf surface. All components of Shaw Sports Turf synthetic turf products have been tested for the extraction of heavy metals and also for semi-volatile and volatile materials. Heavy metal extractions have been performed for the fibers using the DIN 18035-7 which is the environmental standard used for turf fibers installed in Europe. The fibers, backing materials, and infill materials have all been subjected to further testing using CAM 17 protocols for testing for heavy metals. The turf components have also been tested using the US EPA TCLP test for heavy metals, volatiles, and semi-volatile compounds. All of the results from the Shaw Sports Turf products have met the guidelines for the State of California and the EPA concerning heavy metals and volatile materials.

Copies of the third party test reports for the above testing will be provided upon request.

Sincerely,

Phil M Stricklen

Phil M. Stricklen

Dr. Phil M. Stricklen – Director/Research & Development

Phil.Stricklen@shawinc.com Office: 706-275-2150 • Cell 706-331-5407

1131 Broadway Street
Dayton, TN 37321
U.S.A.
Phone: (423) 775-0792

Date: June 29, 2012

MBID# **933**

Material Safety Data Sheet

A. Identity

Chemical Name or Synonyms PP, PE Fiber	**Trade Names** TENCATE, Thiolon, Polyloom
Manufacturer's Name TENCATE GRASS North America	**Color Name/Number** FG #65K
Address 1131 Broadway St. Dayton, TN. 37321, U.S.A.	**Emergency Telephone or Contact** (423)775-0792

B. Hazardous Ingredients

This product does not contain any hazardous ingredients.

CAS#	Chemical Name	% by Weight
	None	

This product is considered to be a non-hazardous chemical under the federal Occupational Safety and Health Administration hazard communication Standard 29 CFR 1910.1200.

C. Physical data

Boiling Point (°C)	N/A	**Melting Point** (°C)	PE=125± 6 PP=168± 5
Vapor Pressure (mm HG & temp.)	N/A	**Specific Gravity** (H2O = 1)	PE=0.90-0.96 PP=0.90-0.93
Molecular Weight	N/A	**Percent Volitile** by Volume %	N/A
Vapor Density (air = 1)	N/A	**Evaporation Rate**	N/A

D. Reactivity Data

Stability (thermal, light, ect.)	Unstable Stable	 X	**Conditions to avoid:** None
Incompatibility (materials to avoid): Some hydrocarbons may cause swelling at room temperature. Some solvents will dissolve yarn at elevated temperature.			
Hazardous Decomposition Products:	N/A		
Hazardous Polymerization	May Occur		
	Will not Occur	X	
Conditions to avoid:	None		

E. Fire Hazard Data

Flash Point: >600°F	**Autoignition Temp(°F)** >575°F
Flammable Limits (% by volume in air):	Lel: N/A Uel: N/A
Extinguishing Method: Water, Foam, Carbon Dioxide, Dry Chemicals, and Halon	
Special Fire Fighting Procedures: Use water spray to cool fire exposed surfaces and to protect personel. Wear self contained breathing apparatus when fighting fire in contained area.	
Unusual Fire and Explosion Hazards: Some carbon monoxide smoke formation is possible under oxygen lean conditions.	

TENCATE
1131 Broadway Street
Dayton, TN 37321
U.S.A.
Phone: (423) 775-0792

Date: June 29, 2012

MBID# **933**

Material Safety Data Sheet

F. Physiological Effects and Hazard Data

Threshold Limit Value:	N/A
Effects from Ingestion; if available LD50 and Species:	No information found
Effects from Skin Absorbtion; if available LD50 and Species:	N/A
Effects from Inhalation; if available LD50 and Species:	N/A
Skin Irratation and/or Sensitzation(species):	No information found
Eye Irratation and/or Injury (species):	N/A
Warning Properties (odor threshold,irratation to eyes, nose, throat):	N/A
Chronic Hazards:	No information found
Industrial and/or Human Experience:	No reported incidents.
Acute Signs or Symptons of Overexposure:	No information found
Chronic Signs or Symptons of Overexposure:	No information found
Medical Conditions Aggravated by Exposure:	No information found
Primary Routes of Entry:	No information found
OSHA PEL:	Not established
ACGIH TLV:	Not established
Carcinogenicity:	Not listed as carcinogen or potential carcinogen by NTP, IARC, or OSHA.

G. Emergency and First Aid Procedures

Eye Contact:	Flush with water. Call a physician if needed.
Skin Contact:	N/A
Inhalation:	N/A
Ingestion:	N/A

H. Spill or Leak Procedures

Steps to be taken in case material is released or spilled:
Shut off water source, advise municiple authorities of possible floating non-toxic substance if material enters course of sewer.

Waste disposal method:
Dispose in accordance with federal, state, and local regulations.

I. Control Measures and Precautions

Eye Protection:
Not needed. However, safety glasses or goggles are recommended

Respiratory Protection:
Not needed

Protective Gloves:
Not needed

Ventilation:
Not needed

Other Precautions:
Not needed

Precautions to be taken in handling and storage:
Do not store near flame, heat, or strong oxidents.

Recommenations for Dusty Process:

If there is a potential to generate airborn fiber dust or mist during processing, we recommend an exposure limit of 2.7 mg/m3 air TWA. Adequate ventilation and, if needed, dust mask are recommended.

J. Section 313 Supplier Notification

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Comminity Right -To Know Act of 1986 (40 CFR 372):

CAS#	Chemical Name	% by Weight	% of Total Parent Metal	CAS# of Parent Metal
	None			

K. Legal Disclaimer

While the information and recommendations set forth herein are believed to be accurate and complete as of the date hereof, TENCATE GRASS NORTH AMERICA makes no warranty with respect thereto and disclaims all liability from reliance thereon.

Brock Environmental Statement

The Cradle to Cradle™ concept; “Products Beautiful Inside and Out”

Brock International LLC is the only underlayment manufacturer in the world to have obtained Cradle to Cradle™ certification for it’s three primary product lines; PowerBase, PaverBase and PlayBase.

The Cradle to Cradle Certified Mark provides consumers, regulators, employees, and industry peers with a clear, visible, and tangible understanding of a manufacturer’s commitment to sustainability. Cradle to Cradle Certified is also integrated as a key element of the LEED V4 Green Building Program.

The *Cradle to Cradle Certified*™ Product Standard guides designers and manufacturers through a continual improvement process that looks at a product through five quality categories — material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. A product receives an achievement level in each category — Basic, Bronze, Silver, Gold, or Platinum — with the lowest achievement level representing the product’s overall mark. Brock underlayment products are currently Cradle to Cradle Silver Certified.

In 1992, William McDonough and Dr. Michael Braungart published The Hannover Principles: Design for Sustainability. In 2002, they published Cradle to Cradle: Remaking the Way We Make Things, encapsulating a journey of discovery about materials as biological or technical nutrients and their use periods and their evolution. They created a framework for quality assessment and innovation: the *Cradle to Cradle Certified™* Products Program.

In 2010, after 20 years of working with companies, they saw a need to scale up the transformation. They gifted a license to the certification system and methodology to the public through the creation of the Cradle to Cradle Products Innovation Institute, a non-profit organization. The Institute administers the publicly available *Cradle to Cradle Certified Product Standard*, a systemic approach to product innovation that spurs the creation of truly beautiful, high-quality products, and transforms the production of consumer products into a positive force for society and the environment. The Institute is governed by an independent board of directors and is headquartered in San Francisco, California.

Cradle to Cradle product assessments are performed by a qualified independent organization trained by the Institute. Assessment Summary Reports are reviewed by the Institute, which certifies products meeting the Standard requirements, and licenses the use of the *Cradle to Cradle Certified™* word and design marks to the product manufacturer. Every two years, manufacturers must demonstrate good faith efforts to improve their products in order to have their products recertified.

Brock products are featured as part of the Cradle to Cradle website at:
http://www.c2ccertified.org/drive-change/built-environment

Brock International LLC – Main Office: 2840 Wilderness Place, Boulder CO, 80301
Tel. 303 544 5800 - Fax 303 544 1273 - info@brock-international.com - www.brock-international.com

MATERIAL CERTIFICATION

Brock USA LLC certifies that all PowerBase and SP Series products comply with *California Proposition 65* (Safe Drinking Water and Toxic Enforcement Act of 1986)*. None of the ingredients contained in these products are subject to reporting under this requirement.

This certification applies to all PowerBase™, SP Series, PlayBase™ and PaverBase™ products made from ARPRO™ expanded EPP foam in accordance with ISO 9001 and ISO 14001 certified manufacturing processes and procedures.

For more information contact: http://oehha.ca.gov/prop65.html

April 28th, 2015

Richard Runkles
President
Brock USA LLC

*Note: per State of California Proposition 65 Update effective 27 MAR 2015.

Brock International LLC – Main Office: 2840 Wilderness Place, Boulder CO, 80301
Tel. 303 544 5800 - Fax 303 544 1273 - info@brock-international.com - www.brock-international.com

Material Safety Data Sheet

Important: Read this MSDS before handling and disposing of this product. Pass this information on to all employees, customers and users of this product. This is covered by the OSHA Hazard Communication Rule and this document has been prepared in accordance with the MSDS requirements of this rule.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Product Name: Brock SP14

Company:
Brock USA
2840 Wilderness Place
Boulder, Colorado 80301
USA

Company:
JSP Specialty Foams Division
150 East Brook Lane
Butler, PA 16002
USA

For product information assistance:
Toll-free + 1 (877) 276-2587

SECTION 2 – COMPOSITE INFORMATION ON INGREDIENTS

Component	CAS No.	Composition by Volume
Polypropylene/ethylene Copolymer	9010-79-1	75 to 85%
Polyurethane Adhesive (cured)	Various (Not Established)	15 to 25%

SECTION 3 – HAZARDS IDENTIFICATION EMERGANCY OVERVIEW

Health Hazards: Inhalation Hazard - particulates / dust
Dust may be an eye irritant

Physical Hazards: May produce dust on handling

SECTION 4 – FIRST AID MEASURES

General: In case of an accident or if you feel unwell, seek medical advice IMMEDIATELY.

Inhalation: Remove victim to fresh air immediately. Obtain emergency medical attention if breathing difficulty persists beyond 15 minutes.

Eye Contact: If eye contact occurs, rinse the exposed eye(s) with clean water for 20-30 minutes.

Skin Contact: Not expected to present a significant skin hazard under anticipated conditions of normal use.

Ingestion: Not expected to present a significant ingestion hazard under anticipated conditions of normal use.

Emergency Medical Treatment Procedures: Treat symptomatically.

Detoxification Procedures: After adequate first aid, no further treatment is required, unless symptoms reappear.

SECTION 5 – FIRE FIGHTING MEASURES

Fire and Explosion Hazard: Heat from fire may melt, decompose, and generate flammable vapors.

Extinguishing Media: Dry chemical, CO_2, Foam, Water.

Fire-Fighting Procedures: Do not enter fire area without proper protection. Fight from a safe distance/protected location. For fire, use lots of water as straight stream to "dig" into hot molten mass from outside to open up. Cool interior/prevent re-ignition; spray/fog for surface cooling. Keep above burning material.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

If handling results in dust generation of high temperatures, local exhaust ventilation should be provided.

Substance	Source	Date	Type	Value/Units	Time
Skin Particulates Not Otherwise Regulated No	OSHA	1989	TWA	15MG/M3	8 HRS
(Total Dust) Particulates Not Otherwise Regulated No	OSHA	1989	TWA	15MG/M3	8 HRS
(Respirable Fraction) Nuisance Particulates No	ACGIH	1992	TWA	10MG/M3	8 HRS

SECTION 7 – HANDLING AND STORAGE

Product should be stored away from any heat/ignition source. Adequate exhaust ventilation should be provided when handling results in dust or particulate generation.

SECTION 8 – EXPOSURE CONTROUPERSONAL PROTECTION

Eye: Dust service goggles should be worn to prevent mechanical injury or other irritation to eyes due to airborne particles, which may result from handling this product.

Skin: Not normally considered a skin hazard. Where use can result in skin contact, practice good personal hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking, smoking, and when leaving work.

General: Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: N/AP **Viscosity:** N/AP **Dry Point:** N/AP

Freezing Point: N/AP **Solubility in Water:** Negligible **Specific Gravity:** >0.07@39.2°F

Material Safety Data Sheet

SECTION 10 – STABILITY AND REACTIVITY

Hazardous Decomposition Products: Highly unlikely under normal conditions and use.

Stability: Stable **Hazardous Polymerization:** Not expected to occur

SECTION 11 – TOXICOLOGICAL INFORMATION

Component	Component Health Hazard
Polypropylene/Ethylene Copolymer	No significant hazards
Polyurethane Adhesive (cured)	No significant hazards

SECTION 12 – ECOLOGICAL INFORMATIONS

N/AP

SECTION 13 – DISPOSAL CONSIDERATION

Landfill solids at permitted sites. Use registered transporters. Comply with federal/state/local regulations for solid waste disposal. Solids may be burned, and fired with supplemental fuel. Avoid flameouts. Assure emissions comply with applicable regulations. Contaminated product, soil or water should not be designated RCRA hazardous waste.

SECTION 14 – TRANSPORT INFORMATION

N/AP

SECTION 15 – REGULATORY INFORMATION

Colorado Right-To-Know Substance Lists
Special Hazardous Substances (CO-SHS) must be identified when present in materials at levels greater than the state specified criterion. Environmental Hazards (CO-EH) must be identified when present in materials at levels greater than the state specified criterion. Components with CAS numbers present in this material, at levels specified in section 9 – components do not require reporting under the statute.

SECTION 16 – OTHER INFORMATION

Some of the information presented and conclusions drawn herein are from sources other than direct test data on the material itself.

Disclaimer of Liability

The information in the MSDS was obtained from sources which we believe are reliable, HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRENTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

This MSDS was prepared and is to be used only for this product.

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2840 Wilderness Place
Boulder, Colorado 80301
USA

Company:
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150 East Brook Lane
Butler, PA 16002
USA

For product information assistance:
Toll-free + 1 (877) 276-2587

SECTION 2 — COMPOSITE INFORMATION ON INGREDIENTS

	CAS No.	Composition by Volume
Polypropylene/Ethylene Copolymer	9010-79-1	100%

SECTION 3 — HAZARDS IDENTIFICATION EMERGANCY OVERVIEW

Health Hazards: Inhalation Hazard - particulates / dust
Dust may be an eye irritant

Physical Hazards: May produce dust on handling

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Freezing Point: N/AP **Solubility in Water:** Negligible **Specific Gravity:** >0.07@39.2°F

Material Safety Data Sheet

SECTION 10 – STABILITY AND REACTIVITY

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Stability: Stable **Hazardous Polymerization:** Not expected to occur

SECTION 11 – TOXICOLOGICAL INFORMATION

Component	Component Health Hazard
Polypropylene/Ethylene Copolymer	No significant hazards

SECTION 12 – ECOLOGICAL INFORMATIONS

N/AP

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The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

This MSDS was prepared and is to be used only for this product.

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

MEMORANDUM

To: Steve Sawyer, Brock International
From: Nicole Peacock, Dudek
Subject: Revised Evaluation of Turf Laboratory Analytical Data – Brock International
Date: April 9, 2015
cc:

Dudek evaluated the laboratory analytical results of samples of the Performance Shock Pad - Expanded EPP composite (SP) and the Power Base - Expanded EPP (POWERBASE) from Brock International. These materials are associated with Brock International's synthetic turf product line. The samples were analyzed for constituents that could potentially be used in their manufacture and that may impact water quality or human health.

The Powerbase sample and Shock Pad sample were received by Eurofins-CalScience Laboratory on February 12, 2015. The samples were analyzed for total metals by EPA method 6010B/7471A, volatile organic compounds (VOCs) by EPA method 8260B, and semi-volatile organic compounds (SVOCs) by EPA method 8270C. Leachable concentrations of these constituents were also evaluated following extraction using the Synthetic Precipitation Leaching Procedure (SPLP). Metals, VOCs, and SVOCs may impact stormwater quality, groundwater quality, and/or human health through leaching, direct contact with the synthetic turf, or erosion and release of the infill materials.

The sample results were compared to regulatory thresholds as described below:

- For human health standards – Comparison of solids analyses to EPA Regional Screening Levels (RSLs) and California Human Health Screening Levels (CHHSLs).

- For groundwater quality – Comparison of SPLP extract concentrations to maximum contaminant levels (MCLs).

- For surface water quality – Comparison of SPLP extract concentrations to RWQCB Environmental Screening Levels (ESLs) for surface water (fresh water aquatic habitat).

Comparison to Human Health Standards

The concentrations of metals and VOCs detected in the two samples were below the applicable thresholds for human health standards (Table 1). Additionally, no SVOCs were detected above the laboratory reporting limits.

It should be noted that the original reporting limits for VOCs were elevated due to matrix interference. Matrix interference occurs during laboratory analysis when compounds in the sample that are not target VOCs interfere with the ability to determine the concentrations of the target VOCs below a certain level. Due to the elevated reporting limits in the original laboratory report, Dudek requested that the laboratory report VOC concentrations down to the method detection limit. The resultant laboratory report for VOCs (Appendix B) compares the VOC concentrations to the method detection limit (MDL), which is generally similar to typical, unelevated reporting limits and are as much as 130 times lower than the elevated reporting limits of the original laboratory report. Only one VOC (chloromethane) was detected at a concentration greater than the MDL in both samples (chloromethane was also detected in the method blank, indicating that the detected concentrations could be biased high).

In an abundance of caution, Dudek compared the MDLs for the non-detected VOCs to the human health standards (RSLs) and found that two VOCs have exceptionally low RSLs, such that the MDL is greater than the RSL. These two VOCs are 1,2-dibromo-3-chloropropane and 1,2,3-trichloropropane (Table 1). 1,2-dibromo-3-chloropropane is a soil fumigant and is, therefore, unlikely to be present. Both 1,2-dibromo-3-chloropropane and 1,2,3-trichloropropane break down in the atmosphere when exposed to sunlight. Based on the EPA-reported half-lives of 12 to 15 days for these chemicals and conservatively assuming that the turf material contains these two compounds at concentrations just below the MDL, the concentrations would be less than the RSL within 1 to 2 months. As the RSLs are based on exposure to the VOCs over a period of 25 years, a possible exceedance of the RSLs for 1 to 2 months is not significant.

Therefore, based on comparison of the data to the human health thresholds, the two turf samples are not likely to impact human health.

Table 1 – Product Testing Results

Analyte	POWERBASE	SP	RSL Standard - Commercial	CHHSL Standard - Commercial
	units - mg/kg			
Cobalt	<0.244	0.273	350	3,200
Copper	1.46	2.56	47,000	38,000
Zinc	8.94	22.0	350,000	100,000
Chloromethane	0.24	0.20	0.46	N/A
1,2-dibromo-3-chloropropane	<0.87	<0.89	0.064	N/A
1,2,3-trichloropropane	<0.42	<0.42	0.11	N/A

Abbreviations:

CHHSL = California Human Health Screening Level

mg/kg = milligrams per kilogram

N/A = not applicable

RSL = EPA Regional Screening Level

Notes:

1. Detected analytes (and 2 non-detected VOCs) are listed in Table 1. Non-detected analytes are shown in Appendices A and B.
2. Samples were analyzed for Volatile Organic Compounds by EPA Method 8260B, Semivolatile Organic Compounds by EPA Method 8270C, and metals by EPA Methods 6010B and 7471A.

Comparison to Surface Water and Groundwater Standards

No VOCs or SVOCs were detected in the sample SPLP extracts at concentrations above the laboratory reporting limits. Only one metal, zinc, was detected in the sample extracts at concentrations above the laboratory reporting limits (Table 2).

The concentrations of zinc detected in the extract sample were less than the drinking water MCL, indicating that the samples are not likely to impact groundwater quality.

Potential impacts to surface water quality are evaluated by comparison to the RWQCB ESLs for fresh water habitat. The concentrations of zinc detected in the sample extracts were less than the ESL threshold for fresh water habitat. Implementation of best management practices (BMPs) and project design can reduce the potential surface water impacts in these areas.

Table 2 – Product Leachability Results

Analyte	POWERBASE	SP	ESL Standard – Fresh Water	MCL Standard
	units - mg/L			
Zinc	0.0816	0.117	0.12	5

Abbreviations:

ESL = Environmental Screening Level

MCL = Maximum Contaminant Level

mg/L = milligrams per liter

Notes:

1. Detected analytes are listed in Table 2. Non-detected analytes are shown in Appendix A – Laboratory Reports.
2. Samples were analyzed for Volatile Organic Compounds by EPA Method 8260B, Semivolatile Organic Compounds by EPA Method 8270C, and metals by EPA Methods 6010B and 7470A, following SPLP extraction.
3. The MCL listed for zinc is the secondary MCL.

References:

California Code of Regulations, Title 22, Division 4, Chapter 15, Article 16, Secondary Water Standards, Section 64449, Secondary Maximum Contaminant Levels, 2006.

Office of Environmental Health Hazard Assessment Soil Screening Numbers (CHHSLs) – Updated Table (OEHHA, 2010)

San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels (ESLs; RWQCB, 2013)

U.S. EPA Maximum Contaminant Levels (MCLs) – National Primary Drinking Water Regulations (U.S. EPA 2009)

U.S. EPA Regional Screening Level ("RSL") Summary Table (TR=1E-6, THQ=1) May 2014 (U.S. EPA, 2014)

APPENDIX A

Laboratory Report

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WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 02/24/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Contents

Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Brock International	Work Order:	15-02-0865
	2840 Wilderness Place	Project Name:	POWERBASE / SP ANALYTICAL TESTING
	Boulder, CO 80301-5414	PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:09**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	ND	0.244	0.976	
Copper	1.46	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	8.94	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:11**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	0.273	0.244	0.976	
Copper	2.56	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	22.0	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-01-002-20403**	**N/A**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:23**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.743	0.990	
Arsenic	ND	0.743	0.990	
Barium	ND	0.495	0.990	
Beryllium	ND	0.248	0.990	
Cadmium	ND	0.495	0.990	
Chromium	ND	0.248	0.990	
Cobalt	ND	0.248	0.990	
Copper	ND	0.495	0.990	
Lead	ND	0.495	0.990	
Molybdenum	ND	0.248	0.990	
Nickel	ND	0.248	0.990	
Selenium	ND	0.743	0.990	
Silver	ND	0.248	0.990	
Thallium	ND	0.743	0.990	
Vanadium	ND	0.248	0.990	
Zinc	ND	0.990	0.990	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0816	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:48**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.117	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-021-1471**	**N/A**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:28**	**150216LA3**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0128	0.0100	0.100	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:08**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-04-005-921**	**N/A**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:52**	**150218L05**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 7471A Total
Method: EPA 7471A
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:58**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 14:00**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0862	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-272-989**	**N/A**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:20**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:40**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	4.9	1.00	
Acenaphthylene	ND	4.9	1.00	
Aniline	ND	4.9	1.00	
Anthracene	ND	4.9	1.00	
Azobenzene	ND	4.9	1.00	
Benzidine	ND	98	1.00	
Benzo (a) Anthracene	ND	4.9	1.00	
Benzo (a) Pyrene	ND	4.9	1.00	
Benzo (b) Fluoranthene	ND	4.9	1.00	
Benzo (g,h,i) Perylene	ND	4.9	1.00	
Benzo (k) Fluoranthene	ND	4.9	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	4.9	1.00	
Bis(2-Chloroethoxy) Methane	ND	4.9	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	4.9	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	4.9	1.00	
4-Bromophenyl-Phenyl Ether	ND	4.9	1.00	
Butyl Benzyl Phthalate	ND	4.9	1.00	
4-Chloro-3-Methylphenol	ND	4.9	1.00	
4-Chloroaniline	ND	4.9	1.00	
2-Chloronaphthalene	ND	4.9	1.00	
2-Chlorophenol	ND	4.9	1.00	
4-Chlorophenyl-Phenyl Ether	ND	4.9	1.00	
Chrysene	ND	4.9	1.00	
Di-n-Butyl Phthalate	ND	4.9	1.00	
Di-n-Octyl Phthalate	ND	4.9	1.00	
Dibenz (a,h) Anthracene	ND	4.9	1.00	
Dibenzofuran	ND	4.9	1.00	
1,2-Dichlorobenzene	ND	4.9	1.00	
1,3-Dichlorobenzene	ND	4.9	1.00	
1,4-Dichlorobenzene	ND	4.9	1.00	
3,3'-Dichlorobenzidine	ND	98	1.00	
2,4-Dichlorophenol	ND	4.9	1.00	
Diethyl Phthalate	ND	4.9	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	4.9	1.00	
2,4-Dimethylphenol	ND	4.9	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	4.9	1.00	
2,6-Dinitrotoluene	ND	4.9	1.00	
Fluoranthene	ND	4.9	1.00	
Fluorene	ND	4.9	1.00	
Hexachloro-1,3-Butadiene	ND	4.9	1.00	
Hexachlorobenzene	ND	4.9	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	4.9	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	4.9	1.00	
Isophorone	ND	4.9	1.00	
2-Methylnaphthalene	ND	4.9	1.00	
1-Methylnaphthalene	ND	4.9	1.00	
2-Methylphenol	ND	4.9	1.00	
3/4-Methylphenol	ND	4.9	1.00	
N-Nitroso-di-n-propylamine	ND	4.9	1.00	
N-Nitrosodimethylamine	ND	4.9	1.00	
N-Nitrosodiphenylamine	ND	4.9	1.00	
Naphthalene	ND	4.9	1.00	
4-Nitroaniline	ND	4.9	1.00	
3-Nitroaniline	ND	4.9	1.00	
2-Nitroaniline	ND	4.9	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	4.9	1.00	
2-Nitrophenol	ND	4.9	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	4.9	1.00	
Phenol	ND	4.9	1.00	
Pyrene	ND	4.9	1.00	
Pyridine	ND	4.9	1.00	
1,2,4-Trichlorobenzene	ND	4.9	1.00	
2,4,6-Trichlorophenol	ND	4.9	1.00	
2,4,5-Trichlorophenol	ND	4.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	83	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	86	25-120	
Nitrobenzene-d5	72	33-123	
p-Terphenyl-d14	84	27-159	
Phenol-d6	86	26-122	
2,4,6-Tribromophenol	90	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:58**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	5.0	1.00	
Acenaphthylene	ND	5.0	1.00	
Aniline	ND	5.0	1.00	
Anthracene	ND	5.0	1.00	
Azobenzene	ND	5.0	1.00	
Benzidine	ND	100	1.00	
Benzo (a) Anthracene	ND	5.0	1.00	
Benzo (a) Pyrene	ND	5.0	1.00	
Benzo (b) Fluoranthene	ND	5.0	1.00	
Benzo (g,h,i) Perylene	ND	5.0	1.00	
Benzo (k) Fluoranthene	ND	5.0	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	5.0	1.00	
Bis(2-Chloroethoxy) Methane	ND	5.0	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	5.0	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	5.0	1.00	
4-Bromophenyl-Phenyl Ether	ND	5.0	1.00	
Butyl Benzyl Phthalate	ND	5.0	1.00	
4-Chloro-3-Methylphenol	ND	5.0	1.00	
4-Chloroaniline	ND	5.0	1.00	
2-Chloronaphthalene	ND	5.0	1.00	
2-Chlorophenol	ND	5.0	1.00	
4-Chlorophenyl-Phenyl Ether	ND	5.0	1.00	
Chrysene	ND	5.0	1.00	
Di-n-Butyl Phthalate	ND	5.0	1.00	
Di-n-Octyl Phthalate	ND	5.0	1.00	
Dibenz (a,h) Anthracene	ND	5.0	1.00	
Dibenzofuran	ND	5.0	1.00	
1,2-Dichlorobenzene	ND	5.0	1.00	
1,3-Dichlorobenzene	ND	5.0	1.00	
1,4-Dichlorobenzene	ND	5.0	1.00	
3,3'-Dichlorobenzidine	ND	100	1.00	
2,4-Dichlorophenol	ND	5.0	1.00	
Diethyl Phthalate	ND	5.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	5.0	1.00	
2,4-Dimethylphenol	ND	5.0	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	5.0	1.00	
2,6-Dinitrotoluene	ND	5.0	1.00	
Fluoranthene	ND	5.0	1.00	
Fluorene	ND	5.0	1.00	
Hexachloro-1,3-Butadiene	ND	5.0	1.00	
Hexachlorobenzene	ND	5.0	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	5.0	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	5.0	1.00	
Isophorone	ND	5.0	1.00	
2-Methylnaphthalene	ND	5.0	1.00	
1-Methylnaphthalene	ND	5.0	1.00	
2-Methylphenol	ND	5.0	1.00	
3/4-Methylphenol	ND	5.0	1.00	
N-Nitroso-di-n-propylamine	ND	5.0	1.00	
N-Nitrosodimethylamine	ND	5.0	1.00	
N-Nitrosodiphenylamine	ND	5.0	1.00	
Naphthalene	ND	5.0	1.00	
4-Nitroaniline	ND	5.0	1.00	
3-Nitroaniline	ND	5.0	1.00	
2-Nitroaniline	ND	5.0	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	5.0	1.00	
2-Nitrophenol	ND	5.0	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	5.0	1.00	
Phenol	ND	5.0	1.00	
Pyrene	ND	5.0	1.00	
Pyridine	ND	5.0	1.00	
1,2,4-Trichlorobenzene	ND	5.0	1.00	
2,4,6-Trichlorophenol	ND	5.0	1.00	
2,4,5-Trichlorophenol	ND	5.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	87	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	93	25-120	
Nitrobenzene-d5	76	33-123	
p-Terphenyl-d14	89	27-159	
Phenol-d6	93	26-122	
2,4,6-Tribromophenol	95	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-549-3208**	**N/A**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 13:33**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	0.50	1.00	
Acenaphthylene	ND	0.50	1.00	
Aniline	ND	0.50	1.00	
Anthracene	ND	0.50	1.00	
Azobenzene	ND	0.50	1.00	
Benzidine	ND	10	1.00	
Benzo (a) Anthracene	ND	0.50	1.00	
Benzo (a) Pyrene	ND	0.50	1.00	
Benzo (b) Fluoranthene	ND	0.50	1.00	
Benzo (g,h,i) Perylene	ND	0.50	1.00	
Benzo (k) Fluoranthene	ND	0.50	1.00	
Benzoic Acid	ND	2.5	1.00	
Benzyl Alcohol	ND	0.50	1.00	
Bis(2-Chloroethoxy) Methane	ND	0.50	1.00	
Bis(2-Chloroethyl) Ether	ND	2.5	1.00	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	0.50	1.00	
4-Bromophenyl-Phenyl Ether	ND	0.50	1.00	
Butyl Benzyl Phthalate	ND	0.50	1.00	
4-Chloro-3-Methylphenol	ND	0.50	1.00	
4-Chloroaniline	ND	0.50	1.00	
2-Chloronaphthalene	ND	0.50	1.00	
2-Chlorophenol	ND	0.50	1.00	
4-Chlorophenyl-Phenyl Ether	ND	0.50	1.00	
Chrysene	ND	0.50	1.00	
Di-n-Butyl Phthalate	ND	0.50	1.00	
Di-n-Octyl Phthalate	ND	0.50	1.00	
Dibenz (a,h) Anthracene	ND	0.50	1.00	
Dibenzofuran	ND	0.50	1.00	
1,2-Dichlorobenzene	ND	0.50	1.00	
1,3-Dichlorobenzene	ND	0.50	1.00	
1,4-Dichlorobenzene	ND	0.50	1.00	
3,3'-Dichlorobenzidine	ND	10	1.00	
2,4-Dichlorophenol	ND	0.50	1.00	
Diethyl Phthalate	ND	0.50	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	0.50	1.00	
2,4-Dimethylphenol	ND	0.50	1.00	
4,6-Dinitro-2-Methylphenol	ND	2.5	1.00	
2,4-Dinitrophenol	ND	2.5	1.00	
2,4-Dinitrotoluene	ND	0.50	1.00	
2,6-Dinitrotoluene	ND	0.50	1.00	
Fluoranthene	ND	0.50	1.00	
Fluorene	ND	0.50	1.00	
Hexachloro-1,3-Butadiene	ND	0.50	1.00	
Hexachlorobenzene	ND	0.50	1.00	
Hexachlorocyclopentadiene	ND	2.5	1.00	
Hexachloroethane	ND	0.50	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	0.50	1.00	
Isophorone	ND	0.50	1.00	
2-Methylnaphthalene	ND	0.50	1.00	
1-Methylnaphthalene	ND	0.50	1.00	
2-Methylphenol	ND	0.50	1.00	
3/4-Methylphenol	ND	0.50	1.00	
N-Nitroso-di-n-propylamine	ND	0.50	1.00	
N-Nitrosodimethylamine	ND	0.50	1.00	
N-Nitrosodiphenylamine	ND	0.50	1.00	
Naphthalene	ND	0.50	1.00	
4-Nitroaniline	ND	0.50	1.00	
3-Nitroaniline	ND	0.50	1.00	
2-Nitroaniline	ND	0.50	1.00	
Nitrobenzene	ND	2.5	1.00	
4-Nitrophenol	ND	0.50	1.00	
2-Nitrophenol	ND	0.50	1.00	
Pentachlorophenol	ND	2.5	1.00	
Phenanthrene	ND	0.50	1.00	
Phenol	ND	0.50	1.00	
Pyrene	ND	0.50	1.00	
Pyridine	ND	0.50	1.00	
1,2,4-Trichlorobenzene	ND	0.50	1.00	
2,4,6-Trichlorophenol	ND	0.50	1.00	
2,4,5-Trichlorophenol	ND	0.50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	89	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	92	25-120	
Nitrobenzene-d5	80	33-123	
p-Terphenyl-d14	91	27-159	
Phenol-d6	92	26-122	
2,4,6-Tribromophenol	88	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	
Phenol-d6	34	10-94	
Nitrobenzene-d5	71	35-114	
2-Fluorobiphenyl	72	43-116	
2,4,6-Tribromophenol	83	10-123	
p-Terphenyl-d14	71	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:43**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 5 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	55	21-100	
Phenol-d6	36	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	77	43-116	
2,4,6-Tribromophenol	85	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-025-182**	**N/A**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:07**	**150220L11**

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	
Dimethyl Phthalate	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
Phenol-d6	33	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	71	43-116	
2,4,6-Tribromophenol	82	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	62000	50.0	
Benzene	ND	2500	50.0	
Bromobenzene	ND	2500	50.0	
Bromochloromethane	ND	2500	50.0	
Bromodichloromethane	ND	2500	50.0	
Bromoform	ND	2500	50.0	
Bromomethane	ND	12000	50.0	
2-Butanone	ND	25000	50.0	
n-Butylbenzene	ND	2500	50.0	
sec-Butylbenzene	ND	2500	50.0	
tert-Butylbenzene	ND	2500	50.0	
Carbon Disulfide	ND	25000	50.0	
Carbon Tetrachloride	ND	2500	50.0	
Chlorobenzene	ND	2500	50.0	
Chloroethane	ND	2500	50.0	
Chloroform	ND	2500	50.0	
Chloromethane	ND	12000	50.0	
2-Chlorotoluene	ND	2500	50.0	
4-Chlorotoluene	ND	2500	50.0	
Dibromochloromethane	ND	2500	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	50.0	
1,2-Dibromoethane	ND	2500	50.0	
Dibromomethane	ND	2500	50.0	
1,2-Dichlorobenzene	ND	2500	50.0	
1,3-Dichlorobenzene	ND	2500	50.0	
1,4-Dichlorobenzene	ND	2500	50.0	
Dichlorodifluoromethane	ND	2500	50.0	
1,1-Dichloroethane	ND	2500	50.0	
1,2-Dichloroethane	ND	2500	50.0	
1,1-Dichloroethene	ND	2500	50.0	
c-1,2-Dichloroethene	ND	2500	50.0	
t-1,2-Dichloroethene	ND	2500	50.0	
1,2-Dichloropropane	ND	2500	50.0	
1,3-Dichloropropane	ND	2500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2500	50.0	
1,1-Dichloropropene	ND	2500	50.0	
c-1,3-Dichloropropene	ND	2500	50.0	
t-1,3-Dichloropropene	ND	2500	50.0	
Ethylbenzene	ND	2500	50.0	
2-Hexanone	ND	25000	50.0	
Isopropylbenzene	ND	2500	50.0	
p-Isopropyltoluene	ND	2500	50.0	
Methylene Chloride	ND	25000	50.0	
4-Methyl-2-Pentanone	ND	25000	50.0	
Naphthalene	ND	25000	50.0	
n-Propylbenzene	ND	2500	50.0	
Styrene	ND	2500	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	50.0	
Tetrachloroethene	ND	2500	50.0	
Toluene	ND	2500	50.0	
1,2,3-Trichlorobenzene	ND	5000	50.0	
1,2,4-Trichlorobenzene	ND	2500	50.0	
1,1,1-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	50.0	
Trichloroethene	ND	2500	50.0	
1,2,3-Trichloropropane	ND	2500	50.0	
1,2,4-Trimethylbenzene	ND	2500	50.0	
Trichlorofluoromethane	ND	25000	50.0	
1,3,5-Trimethylbenzene	ND	2500	50.0	
Vinyl Acetate	ND	25000	50.0	
Vinyl Chloride	ND	2500	50.0	
p/m-Xylene	ND	2500	50.0	
o-Xylene	ND	2500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	64000	50.0	
Benzene	ND	2600	50.0	
Bromobenzene	ND	2600	50.0	
Bromochloromethane	ND	2600	50.0	
Bromodichloromethane	ND	2600	50.0	
Bromoform	ND	2600	50.0	
Bromomethane	ND	13000	50.0	
2-Butanone	ND	26000	50.0	
n-Butylbenzene	ND	2600	50.0	
sec-Butylbenzene	ND	2600	50.0	
tert-Butylbenzene	ND	2600	50.0	
Carbon Disulfide	ND	26000	50.0	
Carbon Tetrachloride	ND	2600	50.0	
Chlorobenzene	ND	2600	50.0	
Chloroethane	ND	2600	50.0	
Chloroform	ND	2600	50.0	
Chloromethane	ND	13000	50.0	
2-Chlorotoluene	ND	2600	50.0	
4-Chlorotoluene	ND	2600	50.0	
Dibromochloromethane	ND	2600	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	50.0	
1,2-Dibromoethane	ND	2600	50.0	
Dibromomethane	ND	2600	50.0	
1,2-Dichlorobenzene	ND	2600	50.0	
1,3-Dichlorobenzene	ND	2600	50.0	
1,4-Dichlorobenzene	ND	2600	50.0	
Dichlorodifluoromethane	ND	2600	50.0	
1,1-Dichloroethane	ND	2600	50.0	
1,2-Dichloroethane	ND	2600	50.0	
1,1-Dichloroethene	ND	2600	50.0	
c-1,2-Dichloroethene	ND	2600	50.0	
t-1,2-Dichloroethene	ND	2600	50.0	
1,2-Dichloropropane	ND	2600	50.0	
1,3-Dichloropropane	ND	2600	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2600	50.0	
1,1-Dichloropropene	ND	2600	50.0	
c-1,3-Dichloropropene	ND	2600	50.0	
t-1,3-Dichloropropene	ND	2600	50.0	
Ethylbenzene	ND	2600	50.0	
2-Hexanone	ND	26000	50.0	
Isopropylbenzene	ND	2600	50.0	
p-Isopropyltoluene	ND	2600	50.0	
Methylene Chloride	ND	26000	50.0	
4-Methyl-2-Pentanone	ND	26000	50.0	
Naphthalene	ND	26000	50.0	
n-Propylbenzene	ND	2600	50.0	
Styrene	ND	2600	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	50.0	
Tetrachloroethene	ND	2600	50.0	
Toluene	ND	2600	50.0	
1,2,3-Trichlorobenzene	ND	5100	50.0	
1,2,4-Trichlorobenzene	ND	2600	50.0	
1,1,1-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	50.0	
Trichloroethene	ND	2600	50.0	
1,2,3-Trichloropropane	ND	2600	50.0	
1,2,4-Trimethylbenzene	ND	2600	50.0	
Trichlorofluoromethane	ND	26000	50.0	
1,3,5-Trimethylbenzene	ND	2600	50.0	
Vinyl Acetate	ND	26000	50.0	
Vinyl Chloride	ND	2600	50.0	
p/m-Xylene	ND	2600	50.0	
o-Xylene	ND	2600	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	12000	50.0	
Benzene	ND	500	50.0	
Bromobenzene	ND	500	50.0	
Bromochloromethane	ND	500	50.0	
Bromodichloromethane	ND	500	50.0	
Bromoform	ND	500	50.0	
Bromomethane	ND	2500	50.0	
2-Butanone	ND	5000	50.0	
n-Butylbenzene	ND	500	50.0	
sec-Butylbenzene	ND	500	50.0	
tert-Butylbenzene	ND	500	50.0	
Carbon Disulfide	ND	5000	50.0	
Carbon Tetrachloride	ND	500	50.0	
Chlorobenzene	ND	500	50.0	
Chloroethane	ND	500	50.0	
Chloroform	ND	500	50.0	
Chloromethane	ND	2500	50.0	
2-Chlorotoluene	ND	500	50.0	
4-Chlorotoluene	ND	500	50.0	
Dibromochloromethane	ND	500	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	50.0	
1,2-Dibromoethane	ND	500	50.0	
Dibromomethane	ND	500	50.0	
1,2-Dichlorobenzene	ND	500	50.0	
1,3-Dichlorobenzene	ND	500	50.0	
1,4-Dichlorobenzene	ND	500	50.0	
Dichlorodifluoromethane	ND	500	50.0	
1,1-Dichloroethane	ND	500	50.0	
1,2-Dichloroethane	ND	500	50.0	
1,1-Dichloroethene	ND	500	50.0	
c-1,2-Dichloroethene	ND	500	50.0	
t-1,2-Dichloroethene	ND	500	50.0	
1,2-Dichloropropane	ND	500	50.0	
1,3-Dichloropropane	ND	500	50.0	
2,2-Dichloropropane	ND	500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 6

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	500	50.0	
c-1,3-Dichloropropene	ND	500	50.0	
t-1,3-Dichloropropene	ND	500	50.0	
Ethylbenzene	ND	500	50.0	
2-Hexanone	ND	5000	50.0	
Isopropylbenzene	ND	500	50.0	
p-Isopropyltoluene	ND	500	50.0	
Methylene Chloride	ND	5000	50.0	
4-Methyl-2-Pentanone	ND	5000	50.0	
Naphthalene	ND	5000	50.0	
n-Propylbenzene	ND	500	50.0	
Styrene	ND	500	50.0	
1,1,1,2-Tetrachloroethane	ND	500	50.0	
1,1,2,2-Tetrachloroethane	ND	500	50.0	
Tetrachloroethene	ND	500	50.0	
Toluene	ND	500	50.0	
1,2,3-Trichlorobenzene	ND	1000	50.0	
1,2,4-Trichlorobenzene	ND	500	50.0	
1,1,1-Trichloroethane	ND	500	50.0	
1,1,2-Trichloroethane	ND	500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	50.0	
Trichloroethene	ND	500	50.0	
1,2,3-Trichloropropane	ND	500	50.0	
1,2,4-Trimethylbenzene	ND	500	50.0	
Trichlorofluoromethane	ND	5000	50.0	
1,3,5-Trimethylbenzene	ND	500	50.0	
Vinyl Acetate	ND	5000	50.0	
Vinyl Chloride	ND	500	50.0	
p/m-Xylene	ND	500	50.0	
o-Xylene	ND	500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	
Dibromofluoromethane	109	78-126	
1,2-Dichloroethane-d4	116	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 19:13**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	80-120	
Dibromofluoromethane	107	78-126	
1,2-Dichloroethane-d4	110	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-001-16449**	**N/A**	**Aqueous**	**GC/MS V V**	**02/12/15**	**02/21/15 13:07**	**150221L012**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	80-120	
Dibromofluoromethane	111	78-126	
1,2-Dichloroethane-d4	115	75-135	
Toluene-d8	101	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0982-1	**Sample**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:39**	**150217S04**
15-02-0982-1	**Matrix Spike**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:40**	**150217S04**
15-02-0982-1	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:41**	**150217S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	25.00	4.524	18	3.579	14	50-115	23	0-20	3,4
Arsenic	4.678	25.00	27.64	92	30.42	103	75-125	10	0-20	
Barium	70.67	25.00	100.2	118	96.51	103	75-125	4	0-20	
Beryllium	ND	25.00	24.42	98	27.29	109	75-125	11	0-20	
Cadmium	ND	25.00	24.04	96	26.41	106	75-125	9	0-20	
Chromium	10.95	25.00	33.98	92	36.36	102	75-125	7	0-20	
Cobalt	5.267	25.00	29.41	97	33.07	111	75-125	12	0-20	
Copper	139.3	25.00	149.5	4X	140.4	4X	75-125	4X	0-20	Q
Lead	7.992	25.00	28.22	81	31.44	94	75-125	11	0-20	
Molybdenum	0.3190	25.00	20.13	79	23.19	91	75-125	14	0-20	
Nickel	24.90	25.00	47.16	89	47.80	92	75-125	1	0-20	
Selenium	ND	25.00	22.37	89	25.36	101	75-125	13	0-20	
Silver	ND	12.50	13.30	106	14.26	114	75-125	7	0-20	
Thallium	ND	25.00	22.06	88	23.69	95	75-125	7	0-20	
Vanadium	31.84	25.00	52.08	81	55.79	96	75-125	7	0-20	
Zinc	29.33	25.00	51.15	87	58.80	118	75-125	14	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216SA3**
POWERBASE	**Matrix Spike**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:45**	**150216SA3**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:46**	**150216SA3**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	0.5000	0.4326	87	0.4386	88	72-132	1	0-10	
Arsenic	ND	0.5000	0.4201	84	0.4081	82	80-140	3	0-11	
Barium	ND	0.5000	0.3749	75	0.3516	70	87-123	6	0-6	3
Beryllium	ND	0.5000	0.4362	87	0.4338	87	89-119	1	0-8	3
Cadmium	ND	0.5000	0.4515	90	0.4465	89	82-124	1	0-7	
Chromium	ND	0.5000	0.4517	90	0.4484	90	86-122	1	0-8	
Cobalt	ND	0.5000	0.4652	93	0.4639	93	83-125	0	0-7	
Copper	ND	0.5000	0.4635	93	0.4705	94	78-126	1	0-7	
Lead	ND	0.5000	0.4500	90	0.4489	90	84-120	0	0-7	
Molybdenum	ND	0.5000	0.4316	86	0.4296	86	78-126	0	0-7	
Nickel	ND	0.5000	0.4490	90	0.4451	89	84-120	1	0-7	
Selenium	ND	0.5000	0.4140	83	0.4202	84	79-127	1	0-9	
Silver	ND	0.2500	0.1773	71	0.1650	66	86-128	7	0-7	3
Thallium	ND	0.5000	0.4822	96	0.4791	96	79-121	1	0-8	
Vanadium	ND	0.5000	0.4477	90	0.4423	88	88-118	1	0-7	
Zinc	0.08159	0.5000	0.5544	95	0.5513	94	89-131	1	0-8	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A

Project: POWERBASE / SP ANALYTICAL TESTING

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218S05**
POWERBASE	**Matrix Spike**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:59**	**150218S05**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:06**	**150218S05**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.05000	0.04945	99	0.04934	99	71-134	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0850-1	**Sample**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:25**	**150218S01**
15-02-0850-1	**Matrix Spike**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:27**	**150218S01**
15-02-0850-1	**Matrix Spike Duplicate**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:29**	**150218S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.8350	0.8959	107	0.8939	107	71-137	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1583-5	**Sample**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:28**	**150221S09**
15-02-1583-5	**Matrix Spike**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:51**	**150221S09**
15-02-1583-5	**Matrix Spike Duplicate**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:09**	**150221S09**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acenaphthene	ND	10.00	10.29	103	10.47	105	34-148	2	0-20	
Acenaphthylene	ND	10.00	10.36	104	10.49	105	53-120	1	0-20	
Butyl Benzyl Phthalate	ND	10.00	11.14	111	11.47	115	15-189	3	0-20	
4-Chloro-3-Methylphenol	ND	10.00	9.062	91	9.158	92	32-120	1	0-20	
2-Chlorophenol	ND	10.00	8.993	90	9.273	93	53-120	3	0-20	
1,4-Dichlorobenzene	ND	10.00	8.795	88	9.131	91	43-120	4	0-26	
Dimethyl Phthalate	ND	10.00	10.05	100	10.14	101	44-122	1	0-20	
2,4-Dinitrotoluene	ND	10.00	10.09	101	10.02	100	28-120	1	0-20	
Fluorene	ND	10.00	10.17	102	10.34	103	12-186	2	0-20	
N-Nitroso-di-n-propylamine	ND	10.00	9.282	93	9.446	94	38-140	2	0-20	
Naphthalene	ND	10.00	8.981	90	9.206	92	20-140	2	0-20	
4-Nitrophenol	ND	10.00	8.991	90	8.970	90	14-128	0	0-59	
Pentachlorophenol	ND	10.00	5.400	54	5.622	56	10-124	4	0-20	
Phenol	ND	10.00	8.890	89	9.024	90	22-124	1	0-20	
Pyrene	ND	10.00	10.26	103	10.53	105	31-169	3	0-20	
1,2,4-Trichlorobenzene	ND	10.00	9.384	94	9.526	95	56-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220S11**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 17:47**	**150220S11**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:05**	**150220S11**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Phenol	ND	2000	717.3	36	722.0	36	20-120	1	0-42	
2-Chlorophenol	ND	2000	1560	78	1581	79	23-134	1	0-40	
1,4-Dichlorobenzene	ND	2000	1633	82	1675	84	20-124	3	0-28	
N-Nitroso-di-n-propylamine	ND	2000	1519	76	1574	79	0-230	4	0-38	
1,2,4-Trichlorobenzene	ND	2000	1632	82	1686	84	44-142	3	0-28	
Naphthalene	ND	2000	1626	81	1689	84	50-150	4	0-20	
4-Chloro-3-Methylphenol	ND	2000	1437	72	1480	74	22-147	3	0-20	
Dimethyl Phthalate	ND	2000	1770	88	1807	90	50-150	2	0-20	
Acenaphthylene	ND	2000	1771	89	1847	92	50-150	4	0-20	
Acenaphthene	ND	2000	1880	94	1952	98	47-145	4	0-31	
4-Nitrophenol	ND	2000	523.5	26	531.2	27	0-132	1	0-20	
2,4-Dinitrotoluene	ND	2000	1757	88	1775	89	39-139	1	0-38	
Fluorene	ND	2000	1878	94	1941	97	50-150	3	0-20	
Pentachlorophenol	ND	2000	1099	55	1154	58	14-176	5	0-20	
Pyrene	ND	2000	1657	83	1714	86	52-115	3	0-20	
Butyl Benzyl Phthalate	ND	2000	1759	88	1823	91	50-150	4	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221S006**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 15:46**	**150221S006**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 16:09**	**150221S006**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.65	85	43.15	86	74-122	1	0-21	
Carbon Tetrachloride	ND	50.00	51.03	102	50.20	100	60-144	2	0-21	
Chlorobenzene	ND	50.00	48.13	96	46.93	94	73-120	3	0-22	
1,2-Dibromoethane	ND	50.00	52.50	105	50.48	101	80-122	4	0-20	
1,2-Dichlorobenzene	ND	50.00	52.23	104	51.62	103	70-120	1	0-26	
1,2-Dichloroethane	ND	50.00	47.81	96	48.75	98	64-142	2	0-20	
1,1-Dichloroethene	ND	50.00	39.80	80	40.66	81	52-136	2	0-21	
Ethylbenzene	ND	50.00	45.82	92	44.52	89	77-125	3	0-24	
Toluene	ND	50.00	44.98	90	44.96	90	72-126	0	0-23	
Trichloroethene	ND	50.00	44.07	88	43.50	87	74-128	1	0-22	
Vinyl Chloride	ND	50.00	40.43	81	41.17	82	67-133	2	0-20	
p/m-Xylene	ND	100.0	96.64	97	94.37	94	63-129	2	0-25	
o-Xylene	ND	50.00	50.69	101	49.90	100	62-128	2	0-24	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	52.90	106	50.57	101	68-134	5	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
097-01-002-20403	**LCS**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:25**	**150217L04**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	25.00	22.86	91	80-120	73-127	
Arsenic	25.00	21.93	88	80-120	73-127	
Barium	25.00	23.89	96	80-120	73-127	
Beryllium	25.00	21.53	86	80-120	73-127	
Cadmium	25.00	22.99	92	80-120	73-127	
Chromium	25.00	22.12	88	80-120	73-127	
Cobalt	25.00	22.80	91	80-120	73-127	
Copper	25.00	22.88	92	80-120	73-127	
Lead	25.00	22.47	90	80-120	73-127	
Molybdenum	25.00	22.24	89	80-120	73-127	
Nickel	25.00	22.50	90	80-120	73-127	
Selenium	25.00	22.01	88	80-120	73-127	
Silver	12.50	11.58	93	80-120	73-127	
Thallium	25.00	22.21	89	80-120	73-127	
Vanadium	25.00	22.16	89	80-120	73-127	
Zinc	25.00	23.08	92	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-021-1471	**LCS**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:29**	**150216LA3**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	0.5000	0.4863	97	80-120	73-127	
Arsenic	0.5000	0.4732	95	80-120	73-127	
Barium	0.5000	0.5051	101	80-120	73-127	
Beryllium	0.5000	0.4967	99	80-120	73-127	
Cadmium	0.5000	0.5092	102	80-120	73-127	
Chromium	0.5000	0.5161	103	80-120	73-127	
Cobalt	0.5000	0.5268	105	80-120	73-127	
Copper	0.5000	0.5024	100	80-120	73-127	
Lead	0.5000	0.5109	102	80-120	73-127	
Molybdenum	0.5000	0.4835	97	80-120	73-127	
Nickel	0.5000	0.5120	102	80-120	73-127	
Selenium	0.5000	0.4895	98	80-120	73-127	
Silver	0.2500	0.2379	95	80-120	73-127	
Thallium	0.5000	0.5401	108	80-120	73-127	
Vanadium	0.5000	0.5067	101	80-120	73-127	
Zinc	0.5000	0.5466	109	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 7470A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 3 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-04-005-921	**LCS**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:54**	**150218L05**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.05000	0.04942	99	90-122	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-272-989	**LCS**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:22**	**150218L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.8828	106	85-121	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-549-3208	**LCS**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:26**	**150221L09**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acenaphthene	10.00	10.12	101	51-123	39-135	
Acenaphthylene	10.00	10.15	101	52-120	41-131	
Butyl Benzyl Phthalate	10.00	11.22	112	43-139	27-155	
4-Chloro-3-Methylphenol	10.00	9.037	90	55-121	44-132	
2-Chlorophenol	10.00	8.783	88	58-124	47-135	
1,4-Dichlorobenzene	10.00	8.120	81	42-132	27-147	
Dimethyl Phthalate	10.00	10.25	102	51-123	39-135	
2,4-Dinitrotoluene	10.00	10.09	101	51-129	38-142	
Fluorene	10.00	10.11	101	54-126	42-138	
N-Nitroso-di-n-propylamine	10.00	9.134	91	40-136	24-152	
Naphthalene	10.00	8.746	87	32-146	13-165	
4-Nitrophenol	10.00	8.721	87	24-126	7-143	
Pentachlorophenol	10.00	4.209	42	23-131	5-149	
Phenol	10.00	8.686	87	40-130	25-145	
Pyrene	10.00	10.34	103	47-143	31-159	
1,2,4-Trichlorobenzene	10.00	8.865	89	45-129	31-143	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-025-182	**LCS**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:26**	**150220L11**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Phenol	2000	727.0	36	20-120	3-137	
2-Chlorophenol	2000	1553	78	23-134	4-152	
1,4-Dichlorobenzene	2000	1592	80	20-124	3-141	
N-Nitroso-di-n-propylamine	2000	1529	76	0-230	0-268	
1,2,4-Trichlorobenzene	2000	1618	81	44-142	28-158	
Naphthalene	2000	1644	82	21-133	2-152	
4-Chloro-3-Methylphenol	2000	1435	72	22-147	1-168	
Dimethyl Phthalate	2000	1781	89	0-112	0-131	
Acenaphthylene	2000	1840	92	33-145	14-164	
Acenaphthene	2000	1889	94	47-145	31-161	
4-Nitrophenol	2000	522.1	26	0-132	0-154	
2,4-Dinitrotoluene	2000	1742	87	39-139	22-156	
Fluorene	2000	1883	94	59-121	49-131	
Pentachlorophenol	2000	1081	54	14-176	0-203	
Pyrene	2000	1665	83	52-115	42-126	
Butyl Benzyl Phthalate	2000	1780	89	0-152	0-177	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-001-16449	**LCS**	**Aqueous**	**GC/MS V V**	**02/21/15**	**02/21/15 11:22**	**150221L012**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	43.32	87	80-120	73-127	
Carbon Tetrachloride	50.00	53.00	106	67-139	55-151	
Chlorobenzene	50.00	48.84	98	78-120	71-127	
1,2-Dibromoethane	50.00	53.03	106	80-120	73-127	
1,2-Dichlorobenzene	50.00	51.55	103	63-129	52-140	
1,2-Dichloroethane	50.00	47.89	96	70-130	60-140	
1,1-Dichloroethene	50.00	39.68	79	66-126	56-136	
Ethylbenzene	50.00	46.09	92	80-123	73-130	
Toluene	50.00	45.70	91	80-120	73-127	
Trichloroethene	50.00	44.07	88	80-122	73-129	
Vinyl Chloride	50.00	41.58	83	70-130	60-140	
p/m-Xylene	100.0	95.99	96	75-123	67-131	
o-Xylene	50.00	50.79	102	74-122	66-130	
Methyl-t-Butyl Ether (MTBE)	50.00	55.35	111	69-129	59-139	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6010B	EPA 3050B	935	ICP 7300	1
EPA 6010B	EPA 1312	935	ICP 7300	1
EPA 7470A	EPA 1312	915	Mercury 04	1
EPA 7471A	EPA 7471A Total	915	Mercury 05	1
EPA 8260B	EPA 1312	905	GC/MS V V	2
EPA 8260B	EPA 1312	927	GC/MS V V	2
EPA 8260B	EPA 5030C	905	GC/MS Q	2
EPA 8270C	EPA 3545	923	GC/MS CCC	1
EPA 8270C	EPA 1312	923	GC/MS TT	1

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
	ECI	2/12/15	1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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Analytical Services Quotation

ACCREDITED IN ACCORDANCE WITH nelac

Quote No. 959457 **Last Revised on** 2015-02-04 **by** Albert Vargas

Client Information

Name: David Brown
Client: Brock International
Address: 2840 Wilderness Place
Boulder, CO 80301-5414

Phone: 530-575-8976
Fax:
E-mail: dbrown@brock-international.com

Project Information

Project ID: El Camino Park
Location: El Camino Park
Expected Start Date: 2/3/2015
Quote Valid Until: 8/3/2015

Analytical Fees Include :

☐ Courier Services
☑ Sample Disposal
☐ EDD _____

Matrix	Test	Quantity	TAT	Unit Costs	Subtotal 1	Rush Surcharge	Subtotal 2
Water	EPA 6010B/7470A SPLP CAC Title 22 Metals	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 6010B/7471A CAC Title 22 Metals	2	10	$100.00	$200.00	$0.00	$200.00
Water	EPA 8260B SPLP Volatile Organics	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 8260B Volatile Organics	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 8270C Semi-Volatile Organics	2	10	$200.00	$400.00	$0.00	$400.00
Water	EPA 8270C SPLP Semi-volatile Organics	2	10	$200.00	$400.00	$0.00	$400.00
Water	SPLP Extraction	2	10	$35.00	$70.00	$0.00	$70.00
Water	SPLP ZHE Extraction (for VOC's)	2	10	$50.00	$100.00	$0.00	$100.00

Total for Testcodes : $1,770.00

Quote total: $1,770.00

Comments: Standard Level II report.

Deliverables: Level II ☑ (Standard) Level III ☐ (Surcharge applies) Level IV ☐ (Check availability)

The Chain-of-Custody form is a legally binding document - be sure it is filled out legibly, correctly, and completely!

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL:(714) 895-5494 • FAX: (714) 894-7501

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Analytical Services Quotation

Quote No. 959457 Last Revised on 2015-02-04 **by** Albert Vargas

Your Project Manager will be : Albert Vargas , AlbertVargas@eurofinsUS.com.

Please contact him/her prior to sampling activities to order sampling supplies (e.g. bottles, coolers) or to confirm proper containers and volume requirements.

Our normal business hours are 0830 to 1730 (5:30 pm). If you plan to use a Eurofins Calscience courier for sample pickup, be advised that samples picked up after 1530 (3:30 pm) on a given day will likely be logged in for the following business day (that is, your turnaround time calculation begins the next day). This does not apply to Rush samples of Same Day, 24 hrs, 48 hrs, or 72 hrs. For Rush samples, the turnaround time begins the day of pickup if scheduled during normal business hours.

When ordering sampling containers, order only what is needed. Unused sample containers cannot be returned to Eurofins Calscience for reuse due to possible contamination issues. Eurofins Calscience can only dispose of unused containers. If a client insists on returning unused containers for disposal, a $100 minimum disposal fee applies.

Unless otherwise stated, all analytical work conducted by Eurofins Calscience is subject to its standard terms and conditions, a copy of which is available upon request.

Disposal of solid and aqueous samples will occur 28 days following sample receipt unless other arrangements are made. Air samples will be retained only until analysis is completed. Sediment, tissues, or other marine chemistry samples which are archived frozen will be discarded one year following sample receipt unless other arrangements are made.

In the absence of any other agreement, data package (level III/IV) preparation fees will be either $200 or 10% of the laboratory testing fees, whichever is greater.

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POWERBASE YSR
YOUTH SAFETY RESEARCH by BROCK

0865

Typical Properties

Product Number	PBYSR	
Material Type	Expanded Polypropylene	
Part Format	Edge locking panel	
Part Size – net coverage	16.89 sq ft per panel	
Material Density	3.24 lbs / cubic ft (52 grams / litre)	
Part Thickness	0.9 in (23 mm)	
Part Length	61.1 in	
Part Width	42 in	
Part Weight	3.5 lbs per panel	
Tensile Strength	110 psi	ASTM D3757
Tensile Elongation	40%	ASTM D3757
Vertical Permeability	>50"/hr	EN 12616
Hydraulic Transmissivity (ASTM D4716) *		ASTM D4716
Hydraulic Gradient – 0.005 - Flow Rate (GPM/ft width)	0.36 GPM/ft w	
Hydraulic Gradient – 0.005 - Transmissivity (m^2/s)	1.51E-02	
Hydraulic Gradient – 0.0075 - Flow Rate (GPM/ft width)	0.53 GPM/ft w	
Hydraulic Gradient – 0.075 - Transmissivity (m^2/s)	1.45E-02	
Hydraulic Gradient – 0.01 - Flow Rate (GPM/ft width)	0.63 GPM/ft	
Hydraulic Gradient – 0.01 - Transmissivity (m^2/s)	1.28E-02	
Thermal Expansion per 1° C change	0.003 in / ft	ASTM D696
Compression Strength		ISO 844
@ 25% strain	30 psi	
@ 50% strain	45 psi	
@ 75% strain	90 psi	
Thermal Conductivity Lambda Value	0.0377 W/mK	EN 12667
Thermal Resistance R Value	3.0	ASTM D3575
Friction Coefficient		ISO 8295
movement of artificial turf over 50mm distance		
maximum force	2.0 lbs	
average force	1.58 lbs	
Environmental Standards Testing		
Cradle to Cradle Silver	Certified	
Germany (DIN)	Pass	DIN V – 18035-7
Switzerland (ESSM)	Pass	ESSM 105-d/1997
Microbiological Analysis		
bacteria resistance	no growth	EN 12225 / ASTM G22-76
fungi resistance	no growth	ASTM G21-96
Resistance to Acid and Alkaline Liquids		EN 14030
% tensile strength loss - 100yr model	0% after 12 days	
Resistance to Oxidation (Accelerated Ageing)		EN ISO 13438:2004
% tensile strength loss - 100yr model	6% after 56 days @ 110°C	
CE Declaration Based on the 10 required characteristic standards for CE marking of geosynthetics	Product is predicted to be durable for greater than 100 years in pH conditions of 4<pH<9.	EN 14030 EN ISO 13438:2004

**** Note that ASTM D4716 flow rate and hydraulic transmissivity values are not an indication of athletic field drainage performance and cannot be directly used in drainage calculations.***

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September, 2013

PowerBase by BROCK

Typical Properties

Product Number	PB2000	
Material Type	Expanded Polypropylene	
Part Format	Edge locking panel	
Part Size – net coverage	16.89 sq ft per panel	
Material Density	3.62 lbs / cubic ft (58 grams / litre)	
Part Thickness	0.9 in (23 mm)	
Part Length	61.1 in	
Part Width	42 in	
Part Weight	4.07 lbs per panel	
Tensile Strength	110 psi	ASTM D3575-08
Tensile Elongation	40%	ASTM D3575-08
Water Storage Capacity	0.009 cu ft / sq. ft. - 2.7 litres/m^2	
Vertical Permeability	15,000 mm/hr	EN 12616
Hydraulic Transmissivity (ASTM D4716) *		ASTM D4716
Hydraulic Gradient – 0.005 - Flow Rate (GPM/ft width)	0.36 GPM/ft w	
Hydraulic Gradient – 0.005 - Transmissivity (m^2/s)	1.51E-02	
Hydraulic Gradient – 0.0075 - Flow Rate (GPM/ft width)	0.45 GPM/ft w	
Hydraulic Gradient – 0.075 - Transmissivity (m^2/s)	1.23E-02	
Hydraulic Gradient – 0.01 - Flow Rate (GPM/ft width)	0.56 GPM/ft	
Hydraulic Gradient – 0.01 - Transmissivity (m^2/s)	1.16E-02	
LinearThermal Expansion per 1° C change	0.003 in / ft	ASTM D696-03
Compression Strength		ASTM D3575-08 / ISO 844
@ 25% strain	35 psi	
@ 50% strain	49 psi	
@ 75% strain	100 psi	
Compression Set – static load (25% strain, 22hrs at 23°C, after 24hrs)	9.0% (0.081 in)	ASTM D3575-08 EN ISO 25619-1:2008
Compression Set – static load (1.42psi = 1,000kg/m^2, 22hrs at 23°C, after 24hrs)	1.17% (0.010 in)	ASTM D3575-08 EN ISO 25619-1:2008
Compression Set – repeated impacts (730kPa, repeated load, 10,000 cycles, after 24hrs)	2.4% (0.021 in)	SYSTEM TEST with 50mm artificial turf
Thermal Conductivity Lambda Value	0.0377 W/mK	ASTM C518, EN 12667
Thermal Resistance R Value	3.0	ASTM C518, EN 12667
Friction Coefficient		ISO 8295:2010 mod.
movement of artificial turf over 50mm distance		
maximum force	2.0 lbs	
average force	1.58 lbs	
Environmental Standards Testing		
Cradle to Cradle Silver	Certified	
Germany (DIN)	Pass	DIN V – 18035-7
Switzerland (ESSM)	Pass	ESSM 105-d/1997
Microbiological Analysis		
bacteria resistance	no growth	EN 12225 / ASTM G22-76
fungi resistance	no growth	ASTM G21-96
Resistance to Acid and Alkaline Liquids		EN 14030:2011
% tensile strength loss - 100yr model	0% after 12 days	ISO 12960:1998
Resistance to Oxidation (Accelerated Ageing)		EN ISO 13438:2004
% tensile strength loss - 100yr model	6% after 56 days @ 110°C	
CE Declaration Based on the 10 required characteristic standards for CE marking of geosynthetics	Product is predicted to be durable for greater than 100 years in pH conditions of 4<pH<9.	EN 14030:2011 EN ISO 13438:2004

**** Note that ASTM D4716 flow rate and hydraulic transmissivity values are not an indication of athletic field drainage performance and cannot be directly used in drainage calculations.***

DATA IS TYPICAL PROPERTIES ONLY. THIS DOCUMENT DOES NOT CREATE ANY WARRANTY, EXPRESS OR IMPLIED.
September, 2013

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BROCK SP15
PERFORMANCE SHOCK PAD FOR SYNTHETIC TURF

Specification & Typical Properties

Product Number	ASP15
Material Type	Expanded Polypropylene Composite containing up to 23% by volume pre-consumer and/or reground post-consumer recycled material
Part Format	Interlocking panel
Part Size, nominal net coverage	15.9 sq ft per panel
Material Density, nominal	3.85 lbs / cubic ft
Part Thickness, nominal	15 mm
Part Length, nominal	57.6 in
Part Width, nominal	43.8 in
Part Weight, nominal	3 lbs per panel

Property	Typical Value	Specification	
Tensile Strength	52 psi	> 45 psi	ASTM D3575-08
Tensile Elongation	19%	>10%	ASTM D3575-08
Vertical Permeability	> 50 in / hr	> 50 in / hr	EN 12616
Linear Thermal Expansion per 1° C change	0.0833 mm/m	< 0.12 mm/m	ASTM D696-03
Compression Strength @ 25% strain @ 50% strain @ 75% strain	 32psi 54psi 116psi	 > 25 psi > 40 psi > 90 psi	ASTM D1621-10
Compression Set – static load (25% strain, 22 hrs at 23°C, after 24 hrs)	8.2% (0.089 in)	< 12%	ASTM D3575-08
Compression Set – repeated impacts (95 psi, repeated load, 10,000 cycles, after 24 hrs)	6.0% (0.031 in)	< 9%	Brock test protocol
Friction Coefficient movement of artificial turf over 50mm maximum force average force	 2.44 lbs max force 1.35 lbs avg force	 > 1.80 lbs max force > 1.00 lbs avg force	Brock test protocol
Microbiological Analysis bacteria resistance fungi resistance	 No growth No growth	 No growth No growth	 ASTM G22-76 ASTM G21-96

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BROCK SP14
PERFORMANCE SHOCK PAD FOR SYNTHETIC TURF

0865

Specification & Typical Properties

Product Number	SP14
Material Type	Expanded Polypropylene Composite containing up to 23% by volume pre-consumer and/or reground post-consumer recycled material
Part Format	Interlocking panel
Part Size, nominal net coverage	15.9 sq ft per panel
Material Density, nominal	3.85 lbs / cubic ft
Part Thickness, nominal	14 mm
Part Length, nominal	57.6 in
Part Width, nominal	43.8 in
Part Weight, nominal	2.81 lbs per panel

Property	Typical Value	Specification	
Tensile Strength	52 psi	> 45 psi	ASTM D3575-08
Tensile Elongation	19%	>10%	ASTM D3575-08
Vertical Permeability	> 50 in / hr	> 50 in / hr	EN 12616
Linear Thermal Expansion per 1° C change	0.0833 mm/m	< 0.12 mm/m	ASTM D696-03
Compression Strength @ 25% strain @ 50% strain @ 75% strain	 32psi 54psi 116psi	 > 25 psi > 40 psi > 90 psi	ASTM D1621-10
Compression Set – static load (25% strain, 22 hrs at 23°C, after 24 hrs)	8.2% (0.089 in)	< 12%	ASTM D3575-08
Compression Set – repeated impacts (95 psi, repeated load, 10,000 cycles, after 24 hrs)	6.0% (0.031 in)	< 9%	Brock test protocol
Friction Coefficient movement of artificial turf over 50mm maximum force average force	 2.44 lbs max force 1.35 lbs avg force	 > 1.80 lbs max force > 1.00 lbs avg force	Brock test protocol
Microbiological Analysis bacteria resistance fungi resistance	 No growth No growth	 No growth No growth	 ASTM G22-76 ASTM G21-96

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WORK ORDER #: 15-02-0 8 6 5

SAMPLE RECEIPT FORM

Plastic
Box 1 of 1

CLIENT: Brock Int'l

DATE: 02/12/15

TEMPERATURE: Thermometer ID: SC4 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 24.1 °C + 0.2 °C (CF) = 24.3 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** 3W

CUSTODY SEALS INTACT:

☐ Box ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Checked by:** 3W

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Checked by:** SM

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☐	☑	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑ 2

Aqueous: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** SM

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** TK

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** TK

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APPENDIX **B**

Revised Laboratory Report

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Supplemental Report 1

The original report has been revised/corrected.

WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 04/09/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Contents

Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

EPA 8260B VOCs results are reported to the MDLs (Method Detection Limits).

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Sample Summary

Client:	Brock International 2840 Wilderness Place Boulder, CO 80301-5414	Work Order:	15-02-0865
		Project Name:	POWERBASE / SP ANALYTICAL TESTING
		PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	62000	3100	50.0	
Benzene	ND	2500	65	50.0	
Bromobenzene	ND	2500	100	50.0	
Bromochloromethane	ND	2500	350	50.0	
Bromodichloromethane	ND	2500	120	50.0	
Bromoform	ND	2500	400	50.0	
Bromomethane	ND	12000	4700	50.0	
2-Butanone	ND	25000	1900	50.0	
n-Butylbenzene	ND	2500	78	50.0	
sec-Butylbenzene	ND	2500	290	50.0	
tert-Butylbenzene	ND	2500	75	50.0	
Carbon Disulfide	ND	25000	150	50.0	
Carbon Tetrachloride	ND	2500	140	50.0	
Chlorobenzene	ND	2500	110	50.0	
Chloroethane	ND	2500	750	50.0	
Chloroform	ND	2500	120	50.0	
Chloromethane	240	12000	150	50.0	B,J
2-Chlorotoluene	ND	2500	120	50.0	
4-Chlorotoluene	ND	2500	110	50.0	
Dibromochloromethane	ND	2500	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	870	50.0	
1,2-Dibromoethane	ND	2500	130	50.0	
Dibromomethane	ND	2500	390	50.0	
1,2-Dichlorobenzene	ND	2500	110	50.0	
1,3-Dichlorobenzene	ND	2500	88	50.0	
1,4-Dichlorobenzene	ND	2500	110	50.0	
Dichlorodifluoromethane	ND	2500	220	50.0	
1,1-Dichloroethane	ND	2500	110	50.0	
1,2-Dichloroethane	ND	2500	160	50.0	
1,1-Dichloroethene	ND	2500	170	50.0	
c-1,2-Dichloroethene	ND	2500	140	50.0	
t-1,2-Dichloroethene	ND	2500	250	50.0	
1,2-Dichloropropane	ND	2500	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2500	130	50.0	
2,2-Dichloropropane	ND	2500	170	50.0	
1,1-Dichloropropene	ND	2500	160	50.0	
c-1,3-Dichloropropene	ND	2500	130	50.0	
t-1,3-Dichloropropene	ND	2500	300	50.0	
Ethylbenzene	ND	2500	76	50.0	
2-Hexanone	ND	25000	880	50.0	
Isopropylbenzene	ND	2500	270	50.0	
p-Isopropyltoluene	ND	2500	310	50.0	
Methylene Chloride	ND	25000	670	50.0	
4-Methyl-2-Pentanone	ND	25000	2200	50.0	
Naphthalene	ND	25000	410	50.0	
n-Propylbenzene	ND	2500	250	50.0	
Styrene	ND	2500	300	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	170	50.0	
Tetrachloroethene	ND	2500	100	50.0	
Toluene	ND	2500	260	50.0	
1,2,3-Trichlorobenzene	ND	5000	460	50.0	
1,2,4-Trichlorobenzene	ND	2500	160	50.0	
1,1,1-Trichloroethane	ND	2500	110	50.0	
1,1,2-Trichloroethane	ND	2500	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	180	50.0	
Trichloroethene	ND	2500	150	50.0	
1,2,3-Trichloropropane	ND	2500	420	50.0	
1,2,4-Trimethylbenzene	ND	2500	290	50.0	
Trichlorofluoromethane	ND	25000	190	50.0	
1,3,5-Trimethylbenzene	ND	2500	270	50.0	
Vinyl Acetate	ND	25000	2400	50.0	
Vinyl Chloride	ND	2500	250	50.0	
p/m-Xylene	ND	2500	130	50.0	
o-Xylene	ND	2500	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	64000	3200	50.0	
Benzene	ND	2600	66	50.0	
Bromobenzene	ND	2600	110	50.0	
Bromochloromethane	ND	2600	350	50.0	
Bromodichloromethane	ND	2600	120	50.0	
Bromoform	ND	2600	410	50.0	
Bromomethane	ND	13000	4800	50.0	
2-Butanone	ND	26000	1900	50.0	
n-Butylbenzene	ND	2600	80	50.0	
sec-Butylbenzene	ND	2600	290	50.0	
tert-Butylbenzene	ND	2600	77	50.0	
Carbon Disulfide	ND	26000	160	50.0	
Carbon Tetrachloride	ND	2600	140	50.0	
Chlorobenzene	ND	2600	110	50.0	
Chloroethane	ND	2600	760	50.0	
Chloroform	ND	2600	120	50.0	
Chloromethane	200	13000	160	50.0	B,J
2-Chlorotoluene	ND	2600	120	50.0	
4-Chlorotoluene	ND	2600	110	50.0	
Dibromochloromethane	ND	2600	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	890	50.0	
1,2-Dibromoethane	ND	2600	130	50.0	
Dibromomethane	ND	2600	400	50.0	
1,2-Dichlorobenzene	ND	2600	120	50.0	
1,3-Dichlorobenzene	ND	2600	90	50.0	
1,4-Dichlorobenzene	ND	2600	110	50.0	
Dichlorodifluoromethane	ND	2600	230	50.0	
1,1-Dichloroethane	ND	2600	110	50.0	
1,2-Dichloroethane	ND	2600	160	50.0	
1,1-Dichloroethene	ND	2600	180	50.0	
c-1,2-Dichloroethene	ND	2600	140	50.0	
t-1,2-Dichloroethene	ND	2600	260	50.0	
1,2-Dichloropropane	ND	2600	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2600	130	50.0	
2,2-Dichloropropane	ND	2600	170	50.0	
1,1-Dichloropropene	ND	2600	170	50.0	
c-1,3-Dichloropropene	ND	2600	130	50.0	
t-1,3-Dichloropropene	ND	2600	310	50.0	
Ethylbenzene	ND	2600	77	50.0	
2-Hexanone	ND	26000	900	50.0	
Isopropylbenzene	ND	2600	280	50.0	
p-Isopropyltoluene	ND	2600	320	50.0	
Methylene Chloride	ND	26000	680	50.0	
4-Methyl-2-Pentanone	ND	26000	2200	50.0	
Naphthalene	ND	26000	420	50.0	
n-Propylbenzene	ND	2600	260	50.0	
Styrene	ND	2600	310	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	180	50.0	
Tetrachloroethene	ND	2600	110	50.0	
Toluene	ND	2600	260	50.0	
1,2,3-Trichlorobenzene	ND	5100	470	50.0	
1,2,4-Trichlorobenzene	ND	2600	160	50.0	
1,1,1-Trichloroethane	ND	2600	110	50.0	
1,1,2-Trichloroethane	ND	2600	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	180	50.0	
Trichloroethene	ND	2600	150	50.0	
1,2,3-Trichloropropane	ND	2600	420	50.0	
1,2,4-Trimethylbenzene	ND	2600	300	50.0	
Trichlorofluoromethane	ND	26000	190	50.0	
1,3,5-Trimethylbenzene	ND	2600	280	50.0	
Vinyl Acetate	ND	26000	2400	50.0	
Vinyl Chloride	ND	2600	260	50.0	
p/m-Xylene	ND	2600	140	50.0	
o-Xylene	ND	2600	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	12000	620	50.0	
Benzene	ND	500	13	50.0	
Bromobenzene	ND	500	21	50.0	
Bromochloromethane	ND	500	69	50.0	
Bromodichloromethane	ND	500	23	50.0	
Bromoform	ND	500	79	50.0	
Bromomethane	ND	2500	940	50.0	
2-Butanone	ND	5000	380	50.0	
n-Butylbenzene	ND	500	16	50.0	
sec-Butylbenzene	ND	500	58	50.0	
tert-Butylbenzene	ND	500	15	50.0	
Carbon Disulfide	ND	5000	31	50.0	
Carbon Tetrachloride	ND	500	28	50.0	
Chlorobenzene	ND	500	22	50.0	
Chloroethane	ND	500	150	50.0	
Chloroform	ND	500	24	50.0	
Chloromethane	36	2500	30	50.0	J
2-Chlorotoluene	ND	500	23	50.0	
4-Chlorotoluene	ND	500	21	50.0	
Dibromochloromethane	ND	500	57	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	170	50.0	
1,2-Dibromoethane	ND	500	26	50.0	
Dibromomethane	ND	500	77	50.0	
1,2-Dichlorobenzene	ND	500	23	50.0	
1,3-Dichlorobenzene	ND	500	18	50.0	
1,4-Dichlorobenzene	ND	500	22	50.0	
Dichlorodifluoromethane	ND	500	44	50.0	
1,1-Dichloroethane	ND	500	21	50.0	
1,2-Dichloroethane	ND	500	31	50.0	
1,1-Dichloroethene	ND	500	35	50.0	
c-1,2-Dichloroethene	ND	500	28	50.0	
t-1,2-Dichloroethene	ND	500	51	50.0	
1,2-Dichloropropane	ND	500	44	50.0	
1,3-Dichloropropane	ND	500	25	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
2,2-Dichloropropane	ND	500	33	50.0	
1,1-Dichloropropene	ND	500	33	50.0	
c-1,3-Dichloropropene	ND	500	25	50.0	
t-1,3-Dichloropropene	ND	500	61	50.0	
Ethylbenzene	ND	500	15	50.0	
2-Hexanone	ND	5000	180	50.0	
Isopropylbenzene	ND	500	55	50.0	
p-Isopropyltoluene	ND	500	63	50.0	
Methylene Chloride	ND	5000	130	50.0	
4-Methyl-2-Pentanone	ND	5000	430	50.0	
Naphthalene	ND	5000	81	50.0	
n-Propylbenzene	ND	500	50	50.0	
Styrene	ND	500	60	50.0	
1,1,1,2-Tetrachloroethane	ND	500	24	50.0	
1,1,2,2-Tetrachloroethane	ND	500	35	50.0	
Tetrachloroethene	ND	500	21	50.0	
Toluene	ND	500	52	50.0	
1,2,3-Trichlorobenzene	ND	1000	91	50.0	
1,2,4-Trichlorobenzene	ND	500	31	50.0	
1,1,1-Trichloroethane	ND	500	23	50.0	
1,1,2-Trichloroethane	ND	500	35	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	35	50.0	
Trichloroethene	ND	500	30	50.0	
1,2,3-Trichloropropane	ND	500	83	50.0	
1,2,4-Trimethylbenzene	ND	500	59	50.0	
Trichlorofluoromethane	ND	5000	38	50.0	
1,3,5-Trimethylbenzene	ND	500	55	50.0	
Vinyl Acetate	ND	5000	470	50.0	
Vinyl Chloride	ND	500	50	50.0	
p/m-Xylene	ND	500	27	50.0	
o-Xylene	ND	500	56	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	30	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 8260B	EPA 5030C	905	GC/MS Q	2

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation) ECI	Date: 2/12/15	Time: 1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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Analytical Services Quotation

ACCREDITED IN ACCORDANCE WITH nelac

Quote No. 959457 **Last Revised on** 2015-02-04 **by** Albert Vargas

Client Information

Name: David Brown
Client: Brock International
Address: 2840 Wilderness Place
Boulder, CO 80301-5414

Phone: 530-575-8976
Fax:
E-mail: dbrown@brock-international.com

Project Information

Project ID: El Camino Park
Location: El Camino Park
Expected Start Date: 2/3/2015
Quote Valid Until: 8/3/2015

Analytical Fees Include :

☐ Courier Services
☑ Sample Disposal
☐ EDD _____

Matrix	Test	Quantity	TAT	Unit Costs	Subtotal 1	Rush Surcharge	Subtotal 2
Water	EPA 6010B/7470A SPLP CAC Title 22 Metals	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 6010B/7471A CAC Title 22 Metals	2	10	$100.00	$200.00	$0.00	$200.00
Water	EPA 8260B SPLP Volatile Organics	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 8260B Volatile Organics	2	10	$100.00	$200.00	$0.00	$200.00
Soil	EPA 8270C Semi-Volatile Organics	2	10	$200.00	$400.00	$0.00	$400.00
Water	EPA 8270C SPLP Semi-volatile Organics	2	10	$200.00	$400.00	$0.00	$400.00
Water	SPLP Extraction	2	10	$35.00	$70.00	$0.00	$70.00
Water	SPLP ZHE Extraction (for VOC's)	2	10	$50.00	$100.00	$0.00	$100.00

Total for Testcodes : **$1,770.00**

Quote total: **$1,770.00**

Comments: Standard Level II report.

Deliverables: Level II ☑ (Standard) Level III ☐ (Surcharge applies) Level IV ☐ (Check availability)

The Chain-of-Custody form is a legally binding document - be sure it is filled out legibly, correctly, and completely!

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL:(714) 895-5494 • FAX: (714) 894-7501

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Analytical Services Quotation

Quote No. 959457 Last Revised on 2015-02-04 **by** Albert Vargas

Your Project Manager will be : Albert Vargas , AlbertVargas@eurofinsUS.com.

Please contact him/her prior to sampling activities to order sampling supplies (e.g. bottles, coolers) or to confirm proper containers and volume requirements.

Our normal business hours are 0830 to 1730 (5:30 pm). If you plan to use a Eurofins Calscience courier for sample pickup, be advised that samples picked up after 1530 (3:30 pm) on a given day will likely be logged in for the following business day (that is, your turnaround time calculation begins the next day). This does not apply to Rush samples of Same Day, 24 hrs, 48 hrs, or 72 hrs. For Rush samples, the turnaround time begins the day of pickup if scheduled during normal business hours.

When ordering sampling containers, order only what is needed. Unused sample containers cannot be returned to Eurofins Calscience for reuse due to possible contamination issues. Eurofins Calscience can only dispose of unused containers. If a client insists on returning unused containers for disposal, a $100 minimum disposal fee applies.

Unless otherwise stated, all analytical work conducted by Eurofins Calscience is subject to its standard terms and conditions, a copy of which is available upon request.

Disposal of solid and aqueous samples will occur 28 days following sample receipt unless other arrangements are made. Air samples will be retained only until analysis is completed. Sediment, tissues, or other marine chemistry samples which are archived frozen will be discarded one year following sample receipt unless other arrangements are made.

In the absence of any other agreement, data package (level III/IV) preparation fees will be either $200 or 10% of the laboratory testing fees, whichever is greater.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL:(714) 895-5494 • FAX: (714) 894-7501

0865

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the bioanalytical company

Eurofins Calscience, Inc.

BANKING INFORMATION

CREDIT CARD PAYMENT REQUEST

Date: 2014-02-04

To: Accounts Receivable

Company: Eurofins Calscience, Inc.

Fax: 717.656.0450

Phone: 717.656.2300 x1746

Email: AR_PA@EurofinsUS.com

Customer ID: Quote No. 959457

From: Kristin Kopera

Company: Brock International

Fax: 866-850-9421

Phone: 303-544-5800

Email: kkopera@brock-international.com

Do you need a copy of the receipt: _____ Fax ___x___ Email _____ USPS

CREDIT CARD INFORMATION

Credit Card #: 4388 5760 7905 5813

Cardholder Name: RICHARD R RUNKLES

Exp. Date: 12/17

CVV Code: 189

Statement Address: 1961 Captiva Court

City, State, Zip: Windsor, CO 80550

Authorized Signature: [signature]

☐ ***Please check here if you would like your credit card billed monthly***

Invoice Number	Amount
Quote No. 959457	$1,770.00

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POWERBASE YSR
YOUTH SAFETY RESEARCH by BROCK

0865

Typical Properties

Product Number	PBYSR	
Material Type	Expanded Polypropylene	
Part Format	Edge locking panel	
Part Size – net coverage	16.89 sq ft per panel	
Material Density	3.24 lbs / cubic ft (52 grams / litre)	
Part Thickness	0.9 in (23 mm)	
Part Length	61.1 in	
Part Width	42 in	
Part Weight	3.5 lbs per panel	
Tensile Strength	110 psi	ASTM D3757
Tensile Elongation	40%	ASTM D3757
Vertical Permeability	>50"/hr	EN 12616
Hydraulic Transmissivity (ASTM D4716) *		ASTM D4716
Hydraulic Gradient – 0.005 - Flow Rate (GPM/ft width)	0.36 GPM/ft w	
Hydraulic Gradient – 0.005 - Transmissivity (m^2/s)	1.51E-02	
Hydraulic Gradient – 0.0075 - Flow Rate (GPM/ft width)	0.53 GPM/ft w	
Hydraulic Gradient – 0.075 - Transmissivity (m^2/s)	1.45E-02	
Hydraulic Gradient – 0.01 - Flow Rate (GPM/ft width)	0.63 GPM/ft	
Hydraulic Gradient – 0.01 - Transmissivity (m^2/s)	1.28E-02	
Thermal Expansion per 1° C change	0.003 in / ft	ASTM D696
Compression Strength		ISO 844
@ 25% strain	30 psi	
@ 50% strain	45 psi	
@ 75% strain	90 psi	
Thermal Conductivity Lambda Value	0.0377 W/mK	EN 12667
Thermal Resistance R Value	3.0	ASTM D3575
Friction Coefficient		ISO 8295
movement of artificial turf over 50mm distance		
maximum force	2.0 lbs	
average force	1.58 lbs	
Environmental Standards Testing		
Cradle to Cradle Silver	Certified	
Germany (DIN)	Pass	DIN V – 18035-7
Switzerland (ESSM)	Pass	ESSM 105-d/1997
Microbiological Analysis		
bacteria resistance	no growth	EN 12225 / ASTM G22-76
fungi resistance	no growth	ASTM G21-96
Resistance to Acid and Alkaline Liquids		EN 14030
% tensile strength loss - 100yr model	0% after 12 days	
Resistance to Oxidation (Accelerated Ageing)		EN ISO 13438:2004
% tensile strength loss - 100yr model	6% after 56 days @ 110°C	
CE Declaration Based on the 10 required characteristic standards for CE marking of geosynthetics	Product is predicted to be durable for greater than 100 years in pH conditions of 4<pH<9.	EN 14030 EN ISO 13438:2004

**** Note that ASTM D4716 flow rate and hydraulic transmissivity values are not an indication of athletic field drainage performance and cannot be directly used in drainage calculations.***

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PowerBase by BROCK

Typical Properties

Product Number	PB2000	
Material Type	Expanded Polypropylene	
Part Format	Edge locking panel	
Part Size – net coverage	16.89 sq ft per panel	
Material Density	3.62 lbs / cubic ft (58 grams / litre)	
Part Thickness	0.9 in (23 mm)	
Part Length	61.1 in	
Part Width	42 in	
Part Weight	4.07 lbs per panel	
Tensile Strength	110 psi	ASTM D3575-08
Tensile Elongation	40%	ASTM D3575-08
Water Storage Capacity	0.009 cu ft / sq. ft. - 2.7 litres/m^2	
Vertical Permeability	15,000 mm/hr	EN 12616
Hydraulic Transmissivity (ASTM D4716) *		ASTM D4716
Hydraulic Gradient – 0.005 - Flow Rate (GPM/ft width)	0.36 GPM/ft w	
Hydraulic Gradient – 0.005 - Transmissivity (m^2/s)	1.51E-02	
Hydraulic Gradient – 0.0075 - Flow Rate (GPM/ft width)	0.45 GPM/ft w	
Hydraulic Gradient – 0.075 - Transmissivity (m^2/s)	1.23E-02	
Hydraulic Gradient – 0.01 - Flow Rate (GPM/ft width)	0.56 GPM/ft	
Hydraulic Gradient – 0.01 - Transmissivity (m^2/s)	1.16E-02	
LinearThermal Expansion per 1° C change	0.003 in / ft	ASTM D696-03
Compression Strength		ASTM D3575-08 / ISO 844
@ 25% strain	35 psi	
@ 50% strain	49 psi	
@ 75% strain	100 psi	
Compression Set – static load (25% strain, 22hrs at 23°C, after 24hrs)	9.0% (0.081 in)	ASTM D3575-08 EN ISO 25619-1:2008
Compression Set – static load (1.42psi = 1,000kg/m^2, 22hrs at 23°C, after 24hrs)	1.17% (0.010 in)	ASTM D3575-08 EN ISO 25619-1:2008
Compression Set – repeated impacts (730kPa, repeated load, 10,000 cycles, after 24hrs)	2.4% (0.021 in)	SYSTEM TEST with 50mm artificial turf
Thermal Conductivity Lambda Value	0.0377 W/mK	ASTM C518, EN 12667
Thermal Resistance R Value	3.0	ASTM C518, EN 12667
Friction Coefficient		ISO 8295:2010 mod.
movement of artificial turf over 50mm distance		
maximum force	2.0 lbs	
average force	1.58 lbs	
Environmental Standards Testing		
Cradle to Cradle Silver	Certified	
Germany (DIN)	Pass	DIN V – 18035-7
Switzerland (ESSM)	Pass	ESSM 105-d/1997
Microbiological Analysis		
bacteria resistance	no growth	EN 12225 / ASTM G22-76
fungi resistance	no growth	ASTM G21-96
Resistance to Acid and Alkaline Liquids		EN 14030:2011
% tensile strength loss - 100yr model	0% after 12 days	ISO 12960:1998
Resistance to Oxidation (Accelerated Ageing)		EN ISO 13438:2004
% tensile strength loss - 100yr model	6% after 56 days @ 110°C	
CE Declaration Based on the 10 required characteristic standards for CE marking of geosynthetics	Product is predicted to be durable for greater than 100 years in pH conditions of 4<pH<9.	EN 14030:2011 EN ISO 13438:2004

**** Note that ASTM D4716 flow rate and hydraulic transmissivity values are not an indication of athletic field drainage performance and cannot be directly used in drainage calculations.***

DATA IS TYPICAL PROPERTIES ONLY. THIS DOCUMENT DOES NOT CREATE ANY WARRANTY, EXPRESS OR IMPLIED.

September, 2013

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BROCK SP15
PERFORMANCE SHOCK PAD FOR SYNTHETIC TURF

Specification & Typical Properties

Product Number	ASP15
Material Type	Expanded Polypropylene Composite containing up to 23% by volume pre-consumer and/or reground post-consumer recycled material
Part Format	Interlocking panel
Part Size, nominal net coverage	15.9 sq ft per panel
Material Density, nominal	3.85 lbs / cubic ft
Part Thickness, nominal	15 mm
Part Length, nominal	57.6 in
Part Width, nominal	43.8 in
Part Weight, nominal	3 lbs per panel

Property	Typical Value	Specification	
Tensile Strength	52 psi	> 45 psi	ASTM D3575-08
Tensile Elongation	19%	>10%	ASTM D3575-08
Vertical Permeability	> 50 in / hr	> 50 in / hr	EN 12616
Linear Thermal Expansion per 1° C change	0.0833 mm/m	< 0.12 mm/m	ASTM D696-03
Compression Strength @ 25% strain @ 50% strain @ 75% strain	 32psi 54psi 116psi	 > 25 psi > 40 psi > 90 psi	ASTM D1621-10
Compression Set – static load (25% strain, 22 hrs at 23°C, after 24 hrs)	8.2% (0.089 in)	< 12%	ASTM D3575-08
Compression Set – repeated impacts (95 psi, repeated load, 10,000 cycles, after 24 hrs)	6.0% (0.031 in)	< 9%	Brock test protocol
Friction Coefficient movement of artificial turf over 50mm maximum force average force	 2.44 lbs max force 1.35 lbs avg force	 > 1.80 lbs max force > 1.00 lbs avg force	Brock test protocol
Microbiological Analysis bacteria resistance fungi resistance	 No growth No growth	 No growth No growth	 ASTM G22-76 ASTM G21-96

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BROCK SP14
PERFORMANCE SHOCK PAD FOR SYNTHETIC TURF

0865

Specification & Typical Properties

Product Number	SP14
Material Type	Expanded Polypropylene Composite containing up to 23% by volume pre-consumer and/or reground post-consumer recycled material
Part Format	Interlocking panel
Part Size, nominal net coverage	15.9 sq ft per panel
Material Density, nominal	3.85 lbs / cubic ft
Part Thickness, nominal	14 mm
Part Length, nominal	57.6 in
Part Width, nominal	43.8 in
Part Weight, nominal	2.81 lbs per panel

Property	Typical Value	Specification	
Tensile Strength	52 psi	> 45 psi	ASTM D3575-08
Tensile Elongation	19%	>10%	ASTM D3575-08
Vertical Permeability	> 50 in / hr	> 50 in / hr	EN 12616
Linear Thermal Expansion per 1° C change	0.0833 mm/m	< 0.12 mm/m	ASTM D696-03
Compression Strength @ 25% strain @ 50% strain @ 75% strain	 32psi 54psi 116psi	 > 25 psi > 40 psi > 90 psi	ASTM D1621-10
Compression Set – static load (25% strain, 22 hrs at 23°C, after 24 hrs)	8.2% (0.089 in)	< 12%	ASTM D3575-08
Compression Set – repeated impacts (95 psi, repeated load, 10,000 cycles, after 24 hrs)	6.0% (0.031 in)	< 9%	Brock test protocol
Friction Coefficient movement of artificial turf over 50mm maximum force average force	 2.44 lbs max force 1.35 lbs avg force	 > 1.80 lbs max force > 1.00 lbs avg force	Brock test protocol
Microbiological Analysis bacteria resistance fungi resistance	 No growth No growth	 No growth No growth	 ASTM G22-76 ASTM G21-96

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WORK ORDER #: 15-02-0 8 6 5

Plastic

SAMPLE RECEIPT FORM

Box 1 of 1

CLIENT: Brock Int'l

DATE: 02/12/15

TEMPERATURE: Thermometer ID: SC4 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 24.1 °C + 0.2 °C (CF) = 24.3 °C ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Checked by:** JW

CUSTODY SEALS INTACT:

☐ Box ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Checked by:** JW

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Checked by:** SM

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☐	☑	☐
Analyses received within holding time	☑	☐	☐
Aqueous samples received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfides ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑ 2

Aqueous: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** SM

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** TK

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** TK

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JSP

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ARPRO®

Expanded Polypropylene (EPP)

MATERIAL CERTIFICATION

JSP Certifies that all ARPRO® Expanded Polypropylene (EPP) Foam Beads are manufactured from base resins which comply with Title 21, Code of Federal Regulations (CFR) Parts 177.1520 (c) (item 3.1(a)), 178.2010, and other regulations promulgated under the Federal Food, Drug and Cosmetic Act as may, from time to time, be applicable. It is therefore, permitted by the FDA for use in food contact applications for food types identified in Categories I through IX of Table 1, under conditions of use B (for applications not including cooking) through H of Table 2 in Title 21 CFR, Part 176.170 (c).

It is, however, the responsibility of the customer to determine that all conditions and specifications outlined in the above mentioned regulatory standards, and any other applicable regulatory categories are met, and the products fabricated from this material are acceptable to the FDA for use in their intended food-contact applications.

Steven R. Sopher
Technical Director
JSP International LLC

23 January 2015

Date

 PUBLICATION JSP-BaseResin-FDA-Cert-EPP-2015/01

JSP

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TETER ENGINEERING

March 18, 2016

Mr. Dan Sawyer
CEO
Brock International
2840 Wilderness Place, Suite C
Boulder, CO 80301

RE: Environmental Compatibility Analysis of Brock Powerbase Shock Pad

Dear Mr. Sawyer:

In response to your request, Teter Engineering is pleased to submit this analysis for potential chemicals of concern in Brock Powerbase shock pad. The shock pad sample was analyzed for total heavy metals, total volatile organic compounds (VOCs), total semi-volatile organic compounds (SVOCs), total polycyclic aromatic hydrocarbons (PAHs), leachable heavy metals, leachable VOCs, and leachable SVOCs. The testing results for detected chemicals of concern are tabulated and compared with appropriate screening levels for the protection of human health.

EXECUTIVE SUMMARY

No metals, PAHs, SVOCs, or VOCs were detected at concentrations that exceed screening levels for the protection of human health.

LABORATORY RESULTS AND COMPARISON TO SCREENING LEVELS

Total Metals

The pad sample was prepared using EPA Method 3050B and analyzed for the Title 22 (CAM 17) metals using EPA Method 6010B/7471A. Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) results for antimony, barium, beryllium, copper, and silver were out of control due to suspected matrix interference. The associated laboratory controlled spike (LCS) recovery was in control. The spike recovery and elative percent difference (RPD) control limits do not apply resulting from the copper concentration in the sample exceeding the spike concentration by a factor of four or greater. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

The total metals concentrations are compared to the California Department of Toxic Substances Control (DTSC) Total Threshold Limit Concentrations (TTLCs), California Regional Water Quality Control Board (RWQCB; "Water Board") Environmental Screening Levels (ESLs), the Office of Environmental Health and Hazard Assessment (OEHHA) California Human Health Screening Levels (CHHSLs), and California Soil background levels in Table 1 (OEHHA, 2005). These ESLs and CHHSLs are based on direct contact exposure with contaminated soil is a residential scenario and are extremely conservative for a recreational use scenario. No metals were detected at concentrations that exceed screening levels.

Leachable Metals

The sample was analyzed for leachable metals using the synthetic precipitation leachate procedure (SPLP; EPA Method 1312) with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was analyzed for the CAM 17 metals using EPA Methods 6010B/7471A. No analytical problems were encountered.

The concentrations of dissolved metals are presented in Table 2 and are compared to the target leachate concentrations (TLCs) for the protection of human health and for preventing the degradation of taste and odor in drinking water. No metals were detected in the leachate at concentrations that exceed screening levels.

Total SVOCs and PAHs

The sample were prepared using EPA Method 3545 and analyzed for the SW-846 list of SVOCs using EPA Method 8270C. The sample extract was diluted due to high non-target analytes. The high dilution factors resulted in elevated laboratory reporting limits. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

No SVOCs or PAHs were detected in the sample at concentrations that exceed screening levels.

Leachable SVOCs

The sample was tested for leachable SVOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method 3520C and analyzed for the SW846 list of SVOCs using EPA Method 8270C. No analytical problems were encountered.

No dissolved SVOCs were detected at concentrations that exceed screening levels.

Total VOCs

The sample was prepared using EPA Method 5030B and analyzed for the SW-846 list of VOCs using EPA Method 8260B. Chloromethane was detected in the method blank at levels below that detected in the sample. No other analytical problems were reported. The revised laboratory report provides the concentrations to the method detection limit instead of the reporting limit.

No VOCs were detected in the sample at concentrations that exceed screening levels.

Leachable VOCs

The sample was tested for leachable VOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method 5030B and analyzed for VOCs using EPA Method 8260B. No analytical problems were reported. The revised laboratory report provides the concentrations to the method detection limit instead of the reporting limit.

No VOCs were detected in the leachate at concentrations that exceed screening levels.

CLOSING

I appreciate the opportunity to work with you on this project. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Principal Engineer
Teter Engineering

Attachments:
References
Tables 1-3
Laboratory Reports

TABLE 1 – COMPARISON OF DETECTED TOTAL CONCENTRATIONS WITH REGULATORY LEVELS AND CA SOIL BACKGROUND CONCENTRATIONS

Class	Analyte	CAS Number	DTSC TTLC Regulatory Level (mg/kg)	Water Board ESL (mg/kg)	OEHHA CHSSL (mg/kg)	CA Surface Soil Background (mg/kg)	Brock Powerbase Pad (mg/kg)
Metal	Copper	7440-50-8	2,500	3,100	3,000	28	**1.46**
Metal	Zinc	7440-66-6	5,000	23,000	23,000	81	**8.94**
VOC	Chloromethane	74-87-3	NA	29	NA	NA	**0.24 B,J**

TABLE 2 - COMPARISON DETECTED LEACHABLE CHEMICAL CONCENTRATIONS WITH TLCs FOR THE PROTECTION OF DRINKING WATER

Class	Analyte	CAS Number	Drinking Water Goal (µg/L)	Basis	TLC For Protection of Drinking Water (µg/L)	Brock Powerbase Pad (µg/L)
Metal	Zinc	7440-66-6	2,000	USEPA Lifetime HAL	40,000	**81.6**

TABLE 3 - NOTES AND ABBREVIATIONS

Notes and Abbeviations

1. Target Leachate Concentrations are calculated using a DAF of 20.
2. Water Board ESL is for Residential Direct Contact Risk.

B: See Laboratory Report Narrative
BG: Background
CAS: Chemical Abstracts Service
CHSSL: California Human Health Screening Level
DAF: Dilution Attenuation Factor
ESL: Environmental Screening Level
HAL: Health Advisory Level
J: Estimated value
MCL: Maximum Contaminant Level
mg/kg: Milligram per kilogram
NA: Not Applicable
OEHHA: California Office of Environmental Health Hazard Assessment
PAHs: Polycyclic Aromatic Hydrocarbons
RL: Reporting limit
RWQCB: San Francisco Bay Regional Water Quality Control Board (Water Board)
SPLP: Synthetic Precipitation Leachate Procedure
TLC: Target Leachate Concentration
TTLC: Total Threshold Limit Concentration
USEPA: United States Environmental Protection Agency
µg/L: Micrograms per liter

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WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 02/24/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Contents

Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Brock International	Work Order:	15-02-0865
	2840 Wilderness Place	Project Name:	POWERBASE / SP ANALYTICAL TESTING
	Boulder, CO 80301-5414	PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:09**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	ND	0.244	0.976	
Copper	1.46	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	8.94	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:11**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	0.273	0.244	0.976	
Copper	2.56	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	22.0	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-01-002-20403**	**N/A**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:23**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.743	0.990	
Arsenic	ND	0.743	0.990	
Barium	ND	0.495	0.990	
Beryllium	ND	0.248	0.990	
Cadmium	ND	0.495	0.990	
Chromium	ND	0.248	0.990	
Cobalt	ND	0.248	0.990	
Copper	ND	0.495	0.990	
Lead	ND	0.495	0.990	
Molybdenum	ND	0.248	0.990	
Nickel	ND	0.248	0.990	
Selenium	ND	0.743	0.990	
Silver	ND	0.248	0.990	
Thallium	ND	0.743	0.990	
Vanadium	ND	0.248	0.990	
Zinc	ND	0.990	0.990	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0816	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:48**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.117	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-021-1471**	**N/A**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:28**	**150216LA3**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0128	0.0100	0.100	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:08**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-04-005-921**	**N/A**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:52**	**150218L05**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 7471A Total
Method: EPA 7471A
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:58**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 14:00**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0862	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-272-989**	**N/A**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:20**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:40**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	4.9	1.00	
Acenaphthylene	ND	4.9	1.00	
Aniline	ND	4.9	1.00	
Anthracene	ND	4.9	1.00	
Azobenzene	ND	4.9	1.00	
Benzidine	ND	98	1.00	
Benzo (a) Anthracene	ND	4.9	1.00	
Benzo (a) Pyrene	ND	4.9	1.00	
Benzo (b) Fluoranthene	ND	4.9	1.00	
Benzo (g,h,i) Perylene	ND	4.9	1.00	
Benzo (k) Fluoranthene	ND	4.9	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	4.9	1.00	
Bis(2-Chloroethoxy) Methane	ND	4.9	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	4.9	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	4.9	1.00	
4-Bromophenyl-Phenyl Ether	ND	4.9	1.00	
Butyl Benzyl Phthalate	ND	4.9	1.00	
4-Chloro-3-Methylphenol	ND	4.9	1.00	
4-Chloroaniline	ND	4.9	1.00	
2-Chloronaphthalene	ND	4.9	1.00	
2-Chlorophenol	ND	4.9	1.00	
4-Chlorophenyl-Phenyl Ether	ND	4.9	1.00	
Chrysene	ND	4.9	1.00	
Di-n-Butyl Phthalate	ND	4.9	1.00	
Di-n-Octyl Phthalate	ND	4.9	1.00	
Dibenz (a,h) Anthracene	ND	4.9	1.00	
Dibenzofuran	ND	4.9	1.00	
1,2-Dichlorobenzene	ND	4.9	1.00	
1,3-Dichlorobenzene	ND	4.9	1.00	
1,4-Dichlorobenzene	ND	4.9	1.00	
3,3'-Dichlorobenzidine	ND	98	1.00	
2,4-Dichlorophenol	ND	4.9	1.00	
Diethyl Phthalate	ND	4.9	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	4.9	1.00	
2,4-Dimethylphenol	ND	4.9	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	4.9	1.00	
2,6-Dinitrotoluene	ND	4.9	1.00	
Fluoranthene	ND	4.9	1.00	
Fluorene	ND	4.9	1.00	
Hexachloro-1,3-Butadiene	ND	4.9	1.00	
Hexachlorobenzene	ND	4.9	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	4.9	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	4.9	1.00	
Isophorone	ND	4.9	1.00	
2-Methylnaphthalene	ND	4.9	1.00	
1-Methylnaphthalene	ND	4.9	1.00	
2-Methylphenol	ND	4.9	1.00	
3/4-Methylphenol	ND	4.9	1.00	
N-Nitroso-di-n-propylamine	ND	4.9	1.00	
N-Nitrosodimethylamine	ND	4.9	1.00	
N-Nitrosodiphenylamine	ND	4.9	1.00	
Naphthalene	ND	4.9	1.00	
4-Nitroaniline	ND	4.9	1.00	
3-Nitroaniline	ND	4.9	1.00	
2-Nitroaniline	ND	4.9	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	4.9	1.00	
2-Nitrophenol	ND	4.9	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	4.9	1.00	
Phenol	ND	4.9	1.00	
Pyrene	ND	4.9	1.00	
Pyridine	ND	4.9	1.00	
1,2,4-Trichlorobenzene	ND	4.9	1.00	
2,4,6-Trichlorophenol	ND	4.9	1.00	
2,4,5-Trichlorophenol	ND	4.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	83	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	86	25-120	
Nitrobenzene-d5	72	33-123	
p-Terphenyl-d14	84	27-159	
Phenol-d6	86	26-122	
2,4,6-Tribromophenol	90	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:58**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	5.0	1.00	
Acenaphthylene	ND	5.0	1.00	
Aniline	ND	5.0	1.00	
Anthracene	ND	5.0	1.00	
Azobenzene	ND	5.0	1.00	
Benzidine	ND	100	1.00	
Benzo (a) Anthracene	ND	5.0	1.00	
Benzo (a) Pyrene	ND	5.0	1.00	
Benzo (b) Fluoranthene	ND	5.0	1.00	
Benzo (g,h,i) Perylene	ND	5.0	1.00	
Benzo (k) Fluoranthene	ND	5.0	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	5.0	1.00	
Bis(2-Chloroethoxy) Methane	ND	5.0	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	5.0	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	5.0	1.00	
4-Bromophenyl-Phenyl Ether	ND	5.0	1.00	
Butyl Benzyl Phthalate	ND	5.0	1.00	
4-Chloro-3-Methylphenol	ND	5.0	1.00	
4-Chloroaniline	ND	5.0	1.00	
2-Chloronaphthalene	ND	5.0	1.00	
2-Chlorophenol	ND	5.0	1.00	
4-Chlorophenyl-Phenyl Ether	ND	5.0	1.00	
Chrysene	ND	5.0	1.00	
Di-n-Butyl Phthalate	ND	5.0	1.00	
Di-n-Octyl Phthalate	ND	5.0	1.00	
Dibenz (a,h) Anthracene	ND	5.0	1.00	
Dibenzofuran	ND	5.0	1.00	
1,2-Dichlorobenzene	ND	5.0	1.00	
1,3-Dichlorobenzene	ND	5.0	1.00	
1,4-Dichlorobenzene	ND	5.0	1.00	
3,3'-Dichlorobenzidine	ND	100	1.00	
2,4-Dichlorophenol	ND	5.0	1.00	
Diethyl Phthalate	ND	5.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	5.0	1.00	
2,4-Dimethylphenol	ND	5.0	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	5.0	1.00	
2,6-Dinitrotoluene	ND	5.0	1.00	
Fluoranthene	ND	5.0	1.00	
Fluorene	ND	5.0	1.00	
Hexachloro-1,3-Butadiene	ND	5.0	1.00	
Hexachlorobenzene	ND	5.0	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	5.0	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	5.0	1.00	
Isophorone	ND	5.0	1.00	
2-Methylnaphthalene	ND	5.0	1.00	
1-Methylnaphthalene	ND	5.0	1.00	
2-Methylphenol	ND	5.0	1.00	
3/4-Methylphenol	ND	5.0	1.00	
N-Nitroso-di-n-propylamine	ND	5.0	1.00	
N-Nitrosodimethylamine	ND	5.0	1.00	
N-Nitrosodiphenylamine	ND	5.0	1.00	
Naphthalene	ND	5.0	1.00	
4-Nitroaniline	ND	5.0	1.00	
3-Nitroaniline	ND	5.0	1.00	
2-Nitroaniline	ND	5.0	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	5.0	1.00	
2-Nitrophenol	ND	5.0	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	5.0	1.00	
Phenol	ND	5.0	1.00	
Pyrene	ND	5.0	1.00	
Pyridine	ND	5.0	1.00	
1,2,4-Trichlorobenzene	ND	5.0	1.00	
2,4,6-Trichlorophenol	ND	5.0	1.00	
2,4,5-Trichlorophenol	ND	5.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	87	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	93	25-120	
Nitrobenzene-d5	76	33-123	
p-Terphenyl-d14	89	27-159	
Phenol-d6	93	26-122	
2,4,6-Tribromophenol	95	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-549-3208**	**N/A**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 13:33**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	0.50	1.00	
Acenaphthylene	ND	0.50	1.00	
Aniline	ND	0.50	1.00	
Anthracene	ND	0.50	1.00	
Azobenzene	ND	0.50	1.00	
Benzidine	ND	10	1.00	
Benzo (a) Anthracene	ND	0.50	1.00	
Benzo (a) Pyrene	ND	0.50	1.00	
Benzo (b) Fluoranthene	ND	0.50	1.00	
Benzo (g,h,i) Perylene	ND	0.50	1.00	
Benzo (k) Fluoranthene	ND	0.50	1.00	
Benzoic Acid	ND	2.5	1.00	
Benzyl Alcohol	ND	0.50	1.00	
Bis(2-Chloroethoxy) Methane	ND	0.50	1.00	
Bis(2-Chloroethyl) Ether	ND	2.5	1.00	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	0.50	1.00	
4-Bromophenyl-Phenyl Ether	ND	0.50	1.00	
Butyl Benzyl Phthalate	ND	0.50	1.00	
4-Chloro-3-Methylphenol	ND	0.50	1.00	
4-Chloroaniline	ND	0.50	1.00	
2-Chloronaphthalene	ND	0.50	1.00	
2-Chlorophenol	ND	0.50	1.00	
4-Chlorophenyl-Phenyl Ether	ND	0.50	1.00	
Chrysene	ND	0.50	1.00	
Di-n-Butyl Phthalate	ND	0.50	1.00	
Di-n-Octyl Phthalate	ND	0.50	1.00	
Dibenz (a,h) Anthracene	ND	0.50	1.00	
Dibenzofuran	ND	0.50	1.00	
1,2-Dichlorobenzene	ND	0.50	1.00	
1,3-Dichlorobenzene	ND	0.50	1.00	
1,4-Dichlorobenzene	ND	0.50	1.00	
3,3'-Dichlorobenzidine	ND	10	1.00	
2,4-Dichlorophenol	ND	0.50	1.00	
Diethyl Phthalate	ND	0.50	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	0.50	1.00	
2,4-Dimethylphenol	ND	0.50	1.00	
4,6-Dinitro-2-Methylphenol	ND	2.5	1.00	
2,4-Dinitrophenol	ND	2.5	1.00	
2,4-Dinitrotoluene	ND	0.50	1.00	
2,6-Dinitrotoluene	ND	0.50	1.00	
Fluoranthene	ND	0.50	1.00	
Fluorene	ND	0.50	1.00	
Hexachloro-1,3-Butadiene	ND	0.50	1.00	
Hexachlorobenzene	ND	0.50	1.00	
Hexachlorocyclopentadiene	ND	2.5	1.00	
Hexachloroethane	ND	0.50	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	0.50	1.00	
Isophorone	ND	0.50	1.00	
2-Methylnaphthalene	ND	0.50	1.00	
1-Methylnaphthalene	ND	0.50	1.00	
2-Methylphenol	ND	0.50	1.00	
3/4-Methylphenol	ND	0.50	1.00	
N-Nitroso-di-n-propylamine	ND	0.50	1.00	
N-Nitrosodimethylamine	ND	0.50	1.00	
N-Nitrosodiphenylamine	ND	0.50	1.00	
Naphthalene	ND	0.50	1.00	
4-Nitroaniline	ND	0.50	1.00	
3-Nitroaniline	ND	0.50	1.00	
2-Nitroaniline	ND	0.50	1.00	
Nitrobenzene	ND	2.5	1.00	
4-Nitrophenol	ND	0.50	1.00	
2-Nitrophenol	ND	0.50	1.00	
Pentachlorophenol	ND	2.5	1.00	
Phenanthrene	ND	0.50	1.00	
Phenol	ND	0.50	1.00	
Pyrene	ND	0.50	1.00	
Pyridine	ND	0.50	1.00	
1,2,4-Trichlorobenzene	ND	0.50	1.00	
2,4,6-Trichlorophenol	ND	0.50	1.00	
2,4,5-Trichlorophenol	ND	0.50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	89	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	92	25-120	
Nitrobenzene-d5	80	33-123	
p-Terphenyl-d14	91	27-159	
Phenol-d6	92	26-122	
2,4,6-Tribromophenol	88	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	
Phenol-d6	34	10-94	
Nitrobenzene-d5	71	35-114	
2-Fluorobiphenyl	72	43-116	
2,4,6-Tribromophenol	83	10-123	
p-Terphenyl-d14	71	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:43**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 5 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	55	21-100	
Phenol-d6	36	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	77	43-116	
2,4,6-Tribromophenol	85	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-025-182**	**N/A**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:07**	**150220L11**

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	
Dimethyl Phthalate	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
Phenol-d6	33	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	71	43-116	
2,4,6-Tribromophenol	82	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	62000	50.0	
Benzene	ND	2500	50.0	
Bromobenzene	ND	2500	50.0	
Bromochloromethane	ND	2500	50.0	
Bromodichloromethane	ND	2500	50.0	
Bromoform	ND	2500	50.0	
Bromomethane	ND	12000	50.0	
2-Butanone	ND	25000	50.0	
n-Butylbenzene	ND	2500	50.0	
sec-Butylbenzene	ND	2500	50.0	
tert-Butylbenzene	ND	2500	50.0	
Carbon Disulfide	ND	25000	50.0	
Carbon Tetrachloride	ND	2500	50.0	
Chlorobenzene	ND	2500	50.0	
Chloroethane	ND	2500	50.0	
Chloroform	ND	2500	50.0	
Chloromethane	ND	12000	50.0	
2-Chlorotoluene	ND	2500	50.0	
4-Chlorotoluene	ND	2500	50.0	
Dibromochloromethane	ND	2500	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	50.0	
1,2-Dibromoethane	ND	2500	50.0	
Dibromomethane	ND	2500	50.0	
1,2-Dichlorobenzene	ND	2500	50.0	
1,3-Dichlorobenzene	ND	2500	50.0	
1,4-Dichlorobenzene	ND	2500	50.0	
Dichlorodifluoromethane	ND	2500	50.0	
1,1-Dichloroethane	ND	2500	50.0	
1,2-Dichloroethane	ND	2500	50.0	
1,1-Dichloroethene	ND	2500	50.0	
c-1,2-Dichloroethene	ND	2500	50.0	
t-1,2-Dichloroethene	ND	2500	50.0	
1,2-Dichloropropane	ND	2500	50.0	
1,3-Dichloropropane	ND	2500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2500	50.0	
1,1-Dichloropropene	ND	2500	50.0	
c-1,3-Dichloropropene	ND	2500	50.0	
t-1,3-Dichloropropene	ND	2500	50.0	
Ethylbenzene	ND	2500	50.0	
2-Hexanone	ND	25000	50.0	
Isopropylbenzene	ND	2500	50.0	
p-Isopropyltoluene	ND	2500	50.0	
Methylene Chloride	ND	25000	50.0	
4-Methyl-2-Pentanone	ND	25000	50.0	
Naphthalene	ND	25000	50.0	
n-Propylbenzene	ND	2500	50.0	
Styrene	ND	2500	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	50.0	
Tetrachloroethene	ND	2500	50.0	
Toluene	ND	2500	50.0	
1,2,3-Trichlorobenzene	ND	5000	50.0	
1,2,4-Trichlorobenzene	ND	2500	50.0	
1,1,1-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	50.0	
Trichloroethene	ND	2500	50.0	
1,2,3-Trichloropropane	ND	2500	50.0	
1,2,4-Trimethylbenzene	ND	2500	50.0	
Trichlorofluoromethane	ND	25000	50.0	
1,3,5-Trimethylbenzene	ND	2500	50.0	
Vinyl Acetate	ND	25000	50.0	
Vinyl Chloride	ND	2500	50.0	
p/m-Xylene	ND	2500	50.0	
o-Xylene	ND	2500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	64000	50.0	
Benzene	ND	2600	50.0	
Bromobenzene	ND	2600	50.0	
Bromochloromethane	ND	2600	50.0	
Bromodichloromethane	ND	2600	50.0	
Bromoform	ND	2600	50.0	
Bromomethane	ND	13000	50.0	
2-Butanone	ND	26000	50.0	
n-Butylbenzene	ND	2600	50.0	
sec-Butylbenzene	ND	2600	50.0	
tert-Butylbenzene	ND	2600	50.0	
Carbon Disulfide	ND	26000	50.0	
Carbon Tetrachloride	ND	2600	50.0	
Chlorobenzene	ND	2600	50.0	
Chloroethane	ND	2600	50.0	
Chloroform	ND	2600	50.0	
Chloromethane	ND	13000	50.0	
2-Chlorotoluene	ND	2600	50.0	
4-Chlorotoluene	ND	2600	50.0	
Dibromochloromethane	ND	2600	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	50.0	
1,2-Dibromoethane	ND	2600	50.0	
Dibromomethane	ND	2600	50.0	
1,2-Dichlorobenzene	ND	2600	50.0	
1,3-Dichlorobenzene	ND	2600	50.0	
1,4-Dichlorobenzene	ND	2600	50.0	
Dichlorodifluoromethane	ND	2600	50.0	
1,1-Dichloroethane	ND	2600	50.0	
1,2-Dichloroethane	ND	2600	50.0	
1,1-Dichloroethene	ND	2600	50.0	
c-1,2-Dichloroethene	ND	2600	50.0	
t-1,2-Dichloroethene	ND	2600	50.0	
1,2-Dichloropropane	ND	2600	50.0	
1,3-Dichloropropane	ND	2600	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2600	50.0	
1,1-Dichloropropene	ND	2600	50.0	
c-1,3-Dichloropropene	ND	2600	50.0	
t-1,3-Dichloropropene	ND	2600	50.0	
Ethylbenzene	ND	2600	50.0	
2-Hexanone	ND	26000	50.0	
Isopropylbenzene	ND	2600	50.0	
p-Isopropyltoluene	ND	2600	50.0	
Methylene Chloride	ND	26000	50.0	
4-Methyl-2-Pentanone	ND	26000	50.0	
Naphthalene	ND	26000	50.0	
n-Propylbenzene	ND	2600	50.0	
Styrene	ND	2600	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	50.0	
Tetrachloroethene	ND	2600	50.0	
Toluene	ND	2600	50.0	
1,2,3-Trichlorobenzene	ND	5100	50.0	
1,2,4-Trichlorobenzene	ND	2600	50.0	
1,1,1-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	50.0	
Trichloroethene	ND	2600	50.0	
1,2,3-Trichloropropane	ND	2600	50.0	
1,2,4-Trimethylbenzene	ND	2600	50.0	
Trichlorofluoromethane	ND	26000	50.0	
1,3,5-Trimethylbenzene	ND	2600	50.0	
Vinyl Acetate	ND	26000	50.0	
Vinyl Chloride	ND	2600	50.0	
p/m-Xylene	ND	2600	50.0	
o-Xylene	ND	2600	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	12000	50.0	
Benzene	ND	500	50.0	
Bromobenzene	ND	500	50.0	
Bromochloromethane	ND	500	50.0	
Bromodichloromethane	ND	500	50.0	
Bromoform	ND	500	50.0	
Bromomethane	ND	2500	50.0	
2-Butanone	ND	5000	50.0	
n-Butylbenzene	ND	500	50.0	
sec-Butylbenzene	ND	500	50.0	
tert-Butylbenzene	ND	500	50.0	
Carbon Disulfide	ND	5000	50.0	
Carbon Tetrachloride	ND	500	50.0	
Chlorobenzene	ND	500	50.0	
Chloroethane	ND	500	50.0	
Chloroform	ND	500	50.0	
Chloromethane	ND	2500	50.0	
2-Chlorotoluene	ND	500	50.0	
4-Chlorotoluene	ND	500	50.0	
Dibromochloromethane	ND	500	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	50.0	
1,2-Dibromoethane	ND	500	50.0	
Dibromomethane	ND	500	50.0	
1,2-Dichlorobenzene	ND	500	50.0	
1,3-Dichlorobenzene	ND	500	50.0	
1,4-Dichlorobenzene	ND	500	50.0	
Dichlorodifluoromethane	ND	500	50.0	
1,1-Dichloroethane	ND	500	50.0	
1,2-Dichloroethane	ND	500	50.0	
1,1-Dichloroethene	ND	500	50.0	
c-1,2-Dichloroethene	ND	500	50.0	
t-1,2-Dichloroethene	ND	500	50.0	
1,2-Dichloropropane	ND	500	50.0	
1,3-Dichloropropane	ND	500	50.0	
2,2-Dichloropropane	ND	500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 6

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	500	50.0	
c-1,3-Dichloropropene	ND	500	50.0	
t-1,3-Dichloropropene	ND	500	50.0	
Ethylbenzene	ND	500	50.0	
2-Hexanone	ND	5000	50.0	
Isopropylbenzene	ND	500	50.0	
p-Isopropyltoluene	ND	500	50.0	
Methylene Chloride	ND	5000	50.0	
4-Methyl-2-Pentanone	ND	5000	50.0	
Naphthalene	ND	5000	50.0	
n-Propylbenzene	ND	500	50.0	
Styrene	ND	500	50.0	
1,1,1,2-Tetrachloroethane	ND	500	50.0	
1,1,2,2-Tetrachloroethane	ND	500	50.0	
Tetrachloroethene	ND	500	50.0	
Toluene	ND	500	50.0	
1,2,3-Trichlorobenzene	ND	1000	50.0	
1,2,4-Trichlorobenzene	ND	500	50.0	
1,1,1-Trichloroethane	ND	500	50.0	
1,1,2-Trichloroethane	ND	500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	50.0	
Trichloroethene	ND	500	50.0	
1,2,3-Trichloropropane	ND	500	50.0	
1,2,4-Trimethylbenzene	ND	500	50.0	
Trichlorofluoromethane	ND	5000	50.0	
1,3,5-Trimethylbenzene	ND	500	50.0	
Vinyl Acetate	ND	5000	50.0	
Vinyl Chloride	ND	500	50.0	
p/m-Xylene	ND	500	50.0	
o-Xylene	ND	500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	
Dibromofluoromethane	109	78-126	
1,2-Dichloroethane-d4	116	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 19:13**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	80-120	
Dibromofluoromethane	107	78-126	
1,2-Dichloroethane-d4	110	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-001-16449**	**N/A**	**Aqueous**	**GC/MS V V**	**02/12/15**	**02/21/15 13:07**	**150221L012**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	80-120	
Dibromofluoromethane	111	78-126	
1,2-Dichloroethane-d4	115	75-135	
Toluene-d8	101	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0982-1	**Sample**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:39**	**150217S04**
15-02-0982-1	**Matrix Spike**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:40**	**150217S04**
15-02-0982-1	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:41**	**150217S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	25.00	4.524	18	3.579	14	50-115	23	0-20	3,4
Arsenic	4.678	25.00	27.64	92	30.42	103	75-125	10	0-20	
Barium	70.67	25.00	100.2	118	96.51	103	75-125	4	0-20	
Beryllium	ND	25.00	24.42	98	27.29	109	75-125	11	0-20	
Cadmium	ND	25.00	24.04	96	26.41	106	75-125	9	0-20	
Chromium	10.95	25.00	33.98	92	36.36	102	75-125	7	0-20	
Cobalt	5.267	25.00	29.41	97	33.07	111	75-125	12	0-20	
Copper	139.3	25.00	149.5	4X	140.4	4X	75-125	4X	0-20	Q
Lead	7.992	25.00	28.22	81	31.44	94	75-125	11	0-20	
Molybdenum	0.3190	25.00	20.13	79	23.19	91	75-125	14	0-20	
Nickel	24.90	25.00	47.16	89	47.80	92	75-125	1	0-20	
Selenium	ND	25.00	22.37	89	25.36	101	75-125	13	0-20	
Silver	ND	12.50	13.30	106	14.26	114	75-125	7	0-20	
Thallium	ND	25.00	22.06	88	23.69	95	75-125	7	0-20	
Vanadium	31.84	25.00	52.08	81	55.79	96	75-125	7	0-20	
Zinc	29.33	25.00	51.15	87	58.80	118	75-125	14	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216SA3**
POWERBASE	**Matrix Spike**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:45**	**150216SA3**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:46**	**150216SA3**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	0.5000	0.4326	87	0.4386	88	72-132	1	0-10	
Arsenic	ND	0.5000	0.4201	84	0.4081	82	80-140	3	0-11	
Barium	ND	0.5000	0.3749	75	0.3516	70	87-123	6	0-6	3
Beryllium	ND	0.5000	0.4362	87	0.4338	87	89-119	1	0-8	3
Cadmium	ND	0.5000	0.4515	90	0.4465	89	82-124	1	0-7	
Chromium	ND	0.5000	0.4517	90	0.4484	90	86-122	1	0-8	
Cobalt	ND	0.5000	0.4652	93	0.4639	93	83-125	0	0-7	
Copper	ND	0.5000	0.4635	93	0.4705	94	78-126	1	0-7	
Lead	ND	0.5000	0.4500	90	0.4489	90	84-120	0	0-7	
Molybdenum	ND	0.5000	0.4316	86	0.4296	86	78-126	0	0-7	
Nickel	ND	0.5000	0.4490	90	0.4451	89	84-120	1	0-7	
Selenium	ND	0.5000	0.4140	83	0.4202	84	79-127	1	0-9	
Silver	ND	0.2500	0.1773	71	0.1650	66	86-128	7	0-7	3
Thallium	ND	0.5000	0.4822	96	0.4791	96	79-121	1	0-8	
Vanadium	ND	0.5000	0.4477	90	0.4423	88	88-118	1	0-7	
Zinc	0.08159	0.5000	0.5544	95	0.5513	94	89-131	1	0-8	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A

Project: POWERBASE / SP ANALYTICAL TESTING

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218S05**
POWERBASE	**Matrix Spike**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:59**	**150218S05**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:06**	**150218S05**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.05000	0.04945	99	0.04934	99	71-134	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0850-1	**Sample**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:25**	**150218S01**
15-02-0850-1	**Matrix Spike**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:27**	**150218S01**
15-02-0850-1	**Matrix Spike Duplicate**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:29**	**150218S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.8350	0.8959	107	0.8939	107	71-137	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1583-5	**Sample**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:28**	**150221S09**
15-02-1583-5	**Matrix Spike**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:51**	**150221S09**
15-02-1583-5	**Matrix Spike Duplicate**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:09**	**150221S09**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acenaphthene	ND	10.00	10.29	103	10.47	105	34-148	2	0-20	
Acenaphthylene	ND	10.00	10.36	104	10.49	105	53-120	1	0-20	
Butyl Benzyl Phthalate	ND	10.00	11.14	111	11.47	115	15-189	3	0-20	
4-Chloro-3-Methylphenol	ND	10.00	9.062	91	9.158	92	32-120	1	0-20	
2-Chlorophenol	ND	10.00	8.993	90	9.273	93	53-120	3	0-20	
1,4-Dichlorobenzene	ND	10.00	8.795	88	9.131	91	43-120	4	0-26	
Dimethyl Phthalate	ND	10.00	10.05	100	10.14	101	44-122	1	0-20	
2,4-Dinitrotoluene	ND	10.00	10.09	101	10.02	100	28-120	1	0-20	
Fluorene	ND	10.00	10.17	102	10.34	103	12-186	2	0-20	
N-Nitroso-di-n-propylamine	ND	10.00	9.282	93	9.446	94	38-140	2	0-20	
Naphthalene	ND	10.00	8.981	90	9.206	92	20-140	2	0-20	
4-Nitrophenol	ND	10.00	8.991	90	8.970	90	14-128	0	0-59	
Pentachlorophenol	ND	10.00	5.400	54	5.622	56	10-124	4	0-20	
Phenol	ND	10.00	8.890	89	9.024	90	22-124	1	0-20	
Pyrene	ND	10.00	10.26	103	10.53	105	31-169	3	0-20	
1,2,4-Trichlorobenzene	ND	10.00	9.384	94	9.526	95	56-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220S11**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 17:47**	**150220S11**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:05**	**150220S11**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Phenol	ND	2000	717.3	36	722.0	36	20-120	1	0-42	
2-Chlorophenol	ND	2000	1560	78	1581	79	23-134	1	0-40	
1,4-Dichlorobenzene	ND	2000	1633	82	1675	84	20-124	3	0-28	
N-Nitroso-di-n-propylamine	ND	2000	1519	76	1574	79	0-230	4	0-38	
1,2,4-Trichlorobenzene	ND	2000	1632	82	1686	84	44-142	3	0-28	
Naphthalene	ND	2000	1626	81	1689	84	50-150	4	0-20	
4-Chloro-3-Methylphenol	ND	2000	1437	72	1480	74	22-147	3	0-20	
Dimethyl Phthalate	ND	2000	1770	88	1807	90	50-150	2	0-20	
Acenaphthylene	ND	2000	1771	89	1847	92	50-150	4	0-20	
Acenaphthene	ND	2000	1880	94	1952	98	47-145	4	0-31	
4-Nitrophenol	ND	2000	523.5	26	531.2	27	0-132	1	0-20	
2,4-Dinitrotoluene	ND	2000	1757	88	1775	89	39-139	1	0-38	
Fluorene	ND	2000	1878	94	1941	97	50-150	3	0-20	
Pentachlorophenol	ND	2000	1099	55	1154	58	14-176	5	0-20	
Pyrene	ND	2000	1657	83	1714	86	52-115	3	0-20	
Butyl Benzyl Phthalate	ND	2000	1759	88	1823	91	50-150	4	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221S006**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 15:46**	**150221S006**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 16:09**	**150221S006**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.65	85	43.15	86	74-122	1	0-21	
Carbon Tetrachloride	ND	50.00	51.03	102	50.20	100	60-144	2	0-21	
Chlorobenzene	ND	50.00	48.13	96	46.93	94	73-120	3	0-22	
1,2-Dibromoethane	ND	50.00	52.50	105	50.48	101	80-122	4	0-20	
1,2-Dichlorobenzene	ND	50.00	52.23	104	51.62	103	70-120	1	0-26	
1,2-Dichloroethane	ND	50.00	47.81	96	48.75	98	64-142	2	0-20	
1,1-Dichloroethene	ND	50.00	39.80	80	40.66	81	52-136	2	0-21	
Ethylbenzene	ND	50.00	45.82	92	44.52	89	77-125	3	0-24	
Toluene	ND	50.00	44.98	90	44.96	90	72-126	0	0-23	
Trichloroethene	ND	50.00	44.07	88	43.50	87	74-128	1	0-22	
Vinyl Chloride	ND	50.00	40.43	81	41.17	82	67-133	2	0-20	
p/m-Xylene	ND	100.0	96.64	97	94.37	94	63-129	2	0-25	
o-Xylene	ND	50.00	50.69	101	49.90	100	62-128	2	0-24	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	52.90	106	50.57	101	68-134	5	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
097-01-002-20403	**LCS**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:25**	**150217L04**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	25.00	22.86	91	80-120	73-127	
Arsenic	25.00	21.93	88	80-120	73-127	
Barium	25.00	23.89	96	80-120	73-127	
Beryllium	25.00	21.53	86	80-120	73-127	
Cadmium	25.00	22.99	92	80-120	73-127	
Chromium	25.00	22.12	88	80-120	73-127	
Cobalt	25.00	22.80	91	80-120	73-127	
Copper	25.00	22.88	92	80-120	73-127	
Lead	25.00	22.47	90	80-120	73-127	
Molybdenum	25.00	22.24	89	80-120	73-127	
Nickel	25.00	22.50	90	80-120	73-127	
Selenium	25.00	22.01	88	80-120	73-127	
Silver	12.50	11.58	93	80-120	73-127	
Thallium	25.00	22.21	89	80-120	73-127	
Vanadium	25.00	22.16	89	80-120	73-127	
Zinc	25.00	23.08	92	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-021-1471	**LCS**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:29**	**150216LA3**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	0.5000	0.4863	97	80-120	73-127	
Arsenic	0.5000	0.4732	95	80-120	73-127	
Barium	0.5000	0.5051	101	80-120	73-127	
Beryllium	0.5000	0.4967	99	80-120	73-127	
Cadmium	0.5000	0.5092	102	80-120	73-127	
Chromium	0.5000	0.5161	103	80-120	73-127	
Cobalt	0.5000	0.5268	105	80-120	73-127	
Copper	0.5000	0.5024	100	80-120	73-127	
Lead	0.5000	0.5109	102	80-120	73-127	
Molybdenum	0.5000	0.4835	97	80-120	73-127	
Nickel	0.5000	0.5120	102	80-120	73-127	
Selenium	0.5000	0.4895	98	80-120	73-127	
Silver	0.2500	0.2379	95	80-120	73-127	
Thallium	0.5000	0.5401	108	80-120	73-127	
Vanadium	0.5000	0.5067	101	80-120	73-127	
Zinc	0.5000	0.5466	109	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 7470A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 3 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-04-005-921	**LCS**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:54**	**150218L05**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.05000	0.04942	99	90-122	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-272-989	**LCS**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:22**	**150218L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.8828	106	85-121	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-549-3208	**LCS**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:26**	**150221L09**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acenaphthene	10.00	10.12	101	51-123	39-135	
Acenaphthylene	10.00	10.15	101	52-120	41-131	
Butyl Benzyl Phthalate	10.00	11.22	112	43-139	27-155	
4-Chloro-3-Methylphenol	10.00	9.037	90	55-121	44-132	
2-Chlorophenol	10.00	8.783	88	58-124	47-135	
1,4-Dichlorobenzene	10.00	8.120	81	42-132	27-147	
Dimethyl Phthalate	10.00	10.25	102	51-123	39-135	
2,4-Dinitrotoluene	10.00	10.09	101	51-129	38-142	
Fluorene	10.00	10.11	101	54-126	42-138	
N-Nitroso-di-n-propylamine	10.00	9.134	91	40-136	24-152	
Naphthalene	10.00	8.746	87	32-146	13-165	
4-Nitrophenol	10.00	8.721	87	24-126	7-143	
Pentachlorophenol	10.00	4.209	42	23-131	5-149	
Phenol	10.00	8.686	87	40-130	25-145	
Pyrene	10.00	10.34	103	47-143	31-159	
1,2,4-Trichlorobenzene	10.00	8.865	89	45-129	31-143	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-025-182	**LCS**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:26**	**150220L11**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Phenol	2000	727.0	36	20-120	3-137	
2-Chlorophenol	2000	1553	78	23-134	4-152	
1,4-Dichlorobenzene	2000	1592	80	20-124	3-141	
N-Nitroso-di-n-propylamine	2000	1529	76	0-230	0-268	
1,2,4-Trichlorobenzene	2000	1618	81	44-142	28-158	
Naphthalene	2000	1644	82	21-133	2-152	
4-Chloro-3-Methylphenol	2000	1435	72	22-147	1-168	
Dimethyl Phthalate	2000	1781	89	0-112	0-131	
Acenaphthylene	2000	1840	92	33-145	14-164	
Acenaphthene	2000	1889	94	47-145	31-161	
4-Nitrophenol	2000	522.1	26	0-132	0-154	
2,4-Dinitrotoluene	2000	1742	87	39-139	22-156	
Fluorene	2000	1883	94	59-121	49-131	
Pentachlorophenol	2000	1081	54	14-176	0-203	
Pyrene	2000	1665	83	52-115	42-126	
Butyl Benzyl Phthalate	2000	1780	89	0-152	0-177	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-001-16449	**LCS**	**Aqueous**	**GC/MS V V**	**02/21/15**	**02/21/15 11:22**	**150221L012**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	43.32	87	80-120	73-127	
Carbon Tetrachloride	50.00	53.00	106	67-139	55-151	
Chlorobenzene	50.00	48.84	98	78-120	71-127	
1,2-Dibromoethane	50.00	53.03	106	80-120	73-127	
1,2-Dichlorobenzene	50.00	51.55	103	63-129	52-140	
1,2-Dichloroethane	50.00	47.89	96	70-130	60-140	
1,1-Dichloroethene	50.00	39.68	79	66-126	56-136	
Ethylbenzene	50.00	46.09	92	80-123	73-130	
Toluene	50.00	45.70	91	80-120	73-127	
Trichloroethene	50.00	44.07	88	80-122	73-129	
Vinyl Chloride	50.00	41.58	83	70-130	60-140	
p/m-Xylene	100.0	95.99	96	75-123	67-131	
o-Xylene	50.00	50.79	102	74-122	66-130	
Methyl-t-Butyl Ether (MTBE)	50.00	55.35	111	69-129	59-139	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6010B	EPA 3050B	935	ICP 7300	1
EPA 6010B	EPA 1312	935	ICP 7300	1
EPA 7470A	EPA 1312	915	Mercury 04	1
EPA 7471A	EPA 7471A Total	915	Mercury 05	1
EPA 8260B	EPA 1312	905	GC/MS V V	2
EPA 8260B	EPA 1312	927	GC/MS V V	2
EPA 8260B	EPA 5030C	905	GC/MS Q	2
EPA 8270C	EPA 3545	923	GC/MS CCC	1
EPA 8270C	EPA 1312	923	GC/MS TT	1

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
	ECI	2/12/15	1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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Supplemental Report 1

The original report has been revised/corrected.

WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 04/09/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

EPA 8260B VOCs results are reported to the MDLs (Method Detection Limits).

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Sample Summary

Client:	Brock International 2840 Wilderness Place Boulder, CO 80301-5414	Work Order:	15-02-0865
		Project Name:	POWERBASE / SP ANALYTICAL TESTING
		PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	62000	3100	50.0	
Benzene	ND	2500	65	50.0	
Bromobenzene	ND	2500	100	50.0	
Bromochloromethane	ND	2500	350	50.0	
Bromodichloromethane	ND	2500	120	50.0	
Bromoform	ND	2500	400	50.0	
Bromomethane	ND	12000	4700	50.0	
2-Butanone	ND	25000	1900	50.0	
n-Butylbenzene	ND	2500	78	50.0	
sec-Butylbenzene	ND	2500	290	50.0	
tert-Butylbenzene	ND	2500	75	50.0	
Carbon Disulfide	ND	25000	150	50.0	
Carbon Tetrachloride	ND	2500	140	50.0	
Chlorobenzene	ND	2500	110	50.0	
Chloroethane	ND	2500	750	50.0	
Chloroform	ND	2500	120	50.0	
Chloromethane	240	12000	150	50.0	B,J
2-Chlorotoluene	ND	2500	120	50.0	
4-Chlorotoluene	ND	2500	110	50.0	
Dibromochloromethane	ND	2500	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	870	50.0	
1,2-Dibromoethane	ND	2500	130	50.0	
Dibromomethane	ND	2500	390	50.0	
1,2-Dichlorobenzene	ND	2500	110	50.0	
1,3-Dichlorobenzene	ND	2500	88	50.0	
1,4-Dichlorobenzene	ND	2500	110	50.0	
Dichlorodifluoromethane	ND	2500	220	50.0	
1,1-Dichloroethane	ND	2500	110	50.0	
1,2-Dichloroethane	ND	2500	160	50.0	
1,1-Dichloroethene	ND	2500	170	50.0	
c-1,2-Dichloroethene	ND	2500	140	50.0	
t-1,2-Dichloroethene	ND	2500	250	50.0	
1,2-Dichloropropane	ND	2500	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2500	130	50.0	
2,2-Dichloropropane	ND	2500	170	50.0	
1,1-Dichloropropene	ND	2500	160	50.0	
c-1,3-Dichloropropene	ND	2500	130	50.0	
t-1,3-Dichloropropene	ND	2500	300	50.0	
Ethylbenzene	ND	2500	76	50.0	
2-Hexanone	ND	25000	880	50.0	
Isopropylbenzene	ND	2500	270	50.0	
p-Isopropyltoluene	ND	2500	310	50.0	
Methylene Chloride	ND	25000	670	50.0	
4-Methyl-2-Pentanone	ND	25000	2200	50.0	
Naphthalene	ND	25000	410	50.0	
n-Propylbenzene	ND	2500	250	50.0	
Styrene	ND	2500	300	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	170	50.0	
Tetrachloroethene	ND	2500	100	50.0	
Toluene	ND	2500	260	50.0	
1,2,3-Trichlorobenzene	ND	5000	460	50.0	
1,2,4-Trichlorobenzene	ND	2500	160	50.0	
1,1,1-Trichloroethane	ND	2500	110	50.0	
1,1,2-Trichloroethane	ND	2500	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	180	50.0	
Trichloroethene	ND	2500	150	50.0	
1,2,3-Trichloropropane	ND	2500	420	50.0	
1,2,4-Trimethylbenzene	ND	2500	290	50.0	
Trichlorofluoromethane	ND	25000	190	50.0	
1,3,5-Trimethylbenzene	ND	2500	270	50.0	
Vinyl Acetate	ND	25000	2400	50.0	
Vinyl Chloride	ND	2500	250	50.0	
p/m-Xylene	ND	2500	130	50.0	
o-Xylene	ND	2500	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	64000	3200	50.0	
Benzene	ND	2600	66	50.0	
Bromobenzene	ND	2600	110	50.0	
Bromochloromethane	ND	2600	350	50.0	
Bromodichloromethane	ND	2600	120	50.0	
Bromoform	ND	2600	410	50.0	
Bromomethane	ND	13000	4800	50.0	
2-Butanone	ND	26000	1900	50.0	
n-Butylbenzene	ND	2600	80	50.0	
sec-Butylbenzene	ND	2600	290	50.0	
tert-Butylbenzene	ND	2600	77	50.0	
Carbon Disulfide	ND	26000	160	50.0	
Carbon Tetrachloride	ND	2600	140	50.0	
Chlorobenzene	ND	2600	110	50.0	
Chloroethane	ND	2600	760	50.0	
Chloroform	ND	2600	120	50.0	
Chloromethane	200	13000	160	50.0	B,J
2-Chlorotoluene	ND	2600	120	50.0	
4-Chlorotoluene	ND	2600	110	50.0	
Dibromochloromethane	ND	2600	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	890	50.0	
1,2-Dibromoethane	ND	2600	130	50.0	
Dibromomethane	ND	2600	400	50.0	
1,2-Dichlorobenzene	ND	2600	120	50.0	
1,3-Dichlorobenzene	ND	2600	90	50.0	
1,4-Dichlorobenzene	ND	2600	110	50.0	
Dichlorodifluoromethane	ND	2600	230	50.0	
1,1-Dichloroethane	ND	2600	110	50.0	
1,2-Dichloroethane	ND	2600	160	50.0	
1,1-Dichloroethene	ND	2600	180	50.0	
c-1,2-Dichloroethene	ND	2600	140	50.0	
t-1,2-Dichloroethene	ND	2600	260	50.0	
1,2-Dichloropropane	ND	2600	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2600	130	50.0	
2,2-Dichloropropane	ND	2600	170	50.0	
1,1-Dichloropropene	ND	2600	170	50.0	
c-1,3-Dichloropropene	ND	2600	130	50.0	
t-1,3-Dichloropropene	ND	2600	310	50.0	
Ethylbenzene	ND	2600	77	50.0	
2-Hexanone	ND	26000	900	50.0	
Isopropylbenzene	ND	2600	280	50.0	
p-Isopropyltoluene	ND	2600	320	50.0	
Methylene Chloride	ND	26000	680	50.0	
4-Methyl-2-Pentanone	ND	26000	2200	50.0	
Naphthalene	ND	26000	420	50.0	
n-Propylbenzene	ND	2600	260	50.0	
Styrene	ND	2600	310	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	180	50.0	
Tetrachloroethene	ND	2600	110	50.0	
Toluene	ND	2600	260	50.0	
1,2,3-Trichlorobenzene	ND	5100	470	50.0	
1,2,4-Trichlorobenzene	ND	2600	160	50.0	
1,1,1-Trichloroethane	ND	2600	110	50.0	
1,1,2-Trichloroethane	ND	2600	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	180	50.0	
Trichloroethene	ND	2600	150	50.0	
1,2,3-Trichloropropane	ND	2600	420	50.0	
1,2,4-Trimethylbenzene	ND	2600	300	50.0	
Trichlorofluoromethane	ND	26000	190	50.0	
1,3,5-Trimethylbenzene	ND	2600	280	50.0	
Vinyl Acetate	ND	26000	2400	50.0	
Vinyl Chloride	ND	2600	260	50.0	
p/m-Xylene	ND	2600	140	50.0	
o-Xylene	ND	2600	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	12000	620	50.0	
Benzene	ND	500	13	50.0	
Bromobenzene	ND	500	21	50.0	
Bromochloromethane	ND	500	69	50.0	
Bromodichloromethane	ND	500	23	50.0	
Bromoform	ND	500	79	50.0	
Bromomethane	ND	2500	940	50.0	
2-Butanone	ND	5000	380	50.0	
n-Butylbenzene	ND	500	16	50.0	
sec-Butylbenzene	ND	500	58	50.0	
tert-Butylbenzene	ND	500	15	50.0	
Carbon Disulfide	ND	5000	31	50.0	
Carbon Tetrachloride	ND	500	28	50.0	
Chlorobenzene	ND	500	22	50.0	
Chloroethane	ND	500	150	50.0	
Chloroform	ND	500	24	50.0	
Chloromethane	36	2500	30	50.0	J
2-Chlorotoluene	ND	500	23	50.0	
4-Chlorotoluene	ND	500	21	50.0	
Dibromochloromethane	ND	500	57	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	170	50.0	
1,2-Dibromoethane	ND	500	26	50.0	
Dibromomethane	ND	500	77	50.0	
1,2-Dichlorobenzene	ND	500	23	50.0	
1,3-Dichlorobenzene	ND	500	18	50.0	
1,4-Dichlorobenzene	ND	500	22	50.0	
Dichlorodifluoromethane	ND	500	44	50.0	
1,1-Dichloroethane	ND	500	21	50.0	
1,2-Dichloroethane	ND	500	31	50.0	
1,1-Dichloroethene	ND	500	35	50.0	
c-1,2-Dichloroethene	ND	500	28	50.0	
t-1,2-Dichloroethene	ND	500	51	50.0	
1,2-Dichloropropane	ND	500	44	50.0	
1,3-Dichloropropane	ND	500	25	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
2,2-Dichloropropane	ND	500	33	50.0	
1,1-Dichloropropene	ND	500	33	50.0	
c-1,3-Dichloropropene	ND	500	25	50.0	
t-1,3-Dichloropropene	ND	500	61	50.0	
Ethylbenzene	ND	500	15	50.0	
2-Hexanone	ND	5000	180	50.0	
Isopropylbenzene	ND	500	55	50.0	
p-Isopropyltoluene	ND	500	63	50.0	
Methylene Chloride	ND	5000	130	50.0	
4-Methyl-2-Pentanone	ND	5000	430	50.0	
Naphthalene	ND	5000	81	50.0	
n-Propylbenzene	ND	500	50	50.0	
Styrene	ND	500	60	50.0	
1,1,1,2-Tetrachloroethane	ND	500	24	50.0	
1,1,2,2-Tetrachloroethane	ND	500	35	50.0	
Tetrachloroethene	ND	500	21	50.0	
Toluene	ND	500	52	50.0	
1,2,3-Trichlorobenzene	ND	1000	91	50.0	
1,2,4-Trichlorobenzene	ND	500	31	50.0	
1,1,1-Trichloroethane	ND	500	23	50.0	
1,1,2-Trichloroethane	ND	500	35	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	35	50.0	
Trichloroethene	ND	500	30	50.0	
1,2,3-Trichloropropane	ND	500	83	50.0	
1,2,4-Trimethylbenzene	ND	500	59	50.0	
Trichlorofluoromethane	ND	5000	38	50.0	
1,3,5-Trimethylbenzene	ND	500	55	50.0	
Vinyl Acetate	ND	5000	470	50.0	
Vinyl Chloride	ND	500	50	50.0	
p/m-Xylene	ND	500	27	50.0	
o-Xylene	ND	500	56	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	30	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 8260B	EPA 5030C	905	GC/MS Q	2

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation) ECI	Date: 2/12/15	Time: 1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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TETER ENGINEERING

March 18, 2016

Mr. Dan Sawyer
CEO
Brock International
2840 Wilderness Place, Suite C
Boulder, CO 80301

RE: Environmental Compatibility Analysis of Brock SP14 Shock Pad

Dear Mr. Sawyer:

In response to your request, Teter Engineering is pleased to submit this analysis for potential chemicals of concern in an expanded polypropylene composite shock pad composed of up to 23% recycled material. Two samples of SP14 shock pad were analyzed for total heavy metals, total volatile organic compounds (VOCs), total semi-volatile organic compounds (SVOCs), total polycyclic aromatic hydrocarbons (PAHs), total polychlorinated biphenyls (PCBs), leachable heavy metals, leachable VOCs, and leachable SVOCs. The first testing was performed by Curtis & Tomkins (Test 1; Report 274217; attached). The second testing was performed by Eurofins (Test 2; Reports 15-02-0865 and 15-02-0865 revised; attached). The testing results for detected chemicals of concern are tabulated and compared with appropriate screening levels for the protection of human health.

EXECUTIVE SUMMARY

No metals, PAHs, PCBs, SVOCs, or VOCs were detected at concentrations that exceed screening levels for the protection of human health. Similar results from two laboratories on different samples indicates that the pre- and post-consumer recycled content in the SP14 pad appears to be stable with regards to chemicals of potential concern.

LABORATORY RESULTS AND COMPARISON TO SCREENING LEVELS

Total Metals

Test 1 Narrative

The pad sample was prepared using EPA Method 3052 and analyzed for the Title 22 (CAM 17) metals using EPA Method 6020/7471A and for hexavalent chromium using EPA Method 7196A. Vanadium was detected at or above the reporting limit (RL) in the

continuing calibration blank (CCB); this analyte was detected in samples at least 10 times the blank level, and affected data was qualified with a "b-flag". Vanadium was detected at or above the RL; this analyte was detected in samples at least 10 times the blank level, and affected data was qualified with a "b-flag". High internal standard responses were observed for scandium in the method blank/blank spike/blank spike duplicate (BS/BSD); affected data was qualified with a "b-flag". Silver, cadmium, and lead were detected between the method detection limit (MDL) and the RL in the method blank; these analytes were not detected in the sample at or above the RL. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The pad sample was prepared using EPA Method 3050B and analyzed for the Title 22 (CAM 17) metals using EPA Method 6010B/7471A. Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) results for antimony, barium, beryllium, copper, and silver were out of control due to suspected matrix interference. The associated laboratory controlled spike (LCS) recovery was in control. The spike recovery and elative percent difference (RPD) control limits do not apply resulting from the copper concentration in the sample exceeding the spike concentration by a factor of four or greater. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Comparison of Results to Screening Levels

The total metals concentrations are compared to the California Department of Toxic Substances Control (DTSC) Total Threshold Limit Concentrations (TTLCs), California Regional Water Quality Control Board (RWQCB; “Water Board”) Environmental Screening Levels (ESLs), the Office of Environmental Health and Hazard Assessment (OEHHA) California Human Health Screening Levels (CHHSLs), and California Soil background levels in Table 1 (OEHHA, 2005). These ESLs and CHHSLs are based on direct contact exposure with contaminated soil is a residential scenario and are extremely conservative for a recreational use scenario. No metals were detected at concentrations that exceed screening levels.

Leachable Metals

Test 1 Narrative

The sample was analyzed for leachable metals using the synthetic precipitation leachate

procedure (SPLP; EPA Method 1312) with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was analyzed for the CAM 17 metals using EPA Methods 6020/7471A and hexavalent chromium using EPA Method 7199. Chromium and vanadium were detected between the MDL and the RL in the method blank for batch 232235. Low recovery was observed for hexavalent chromium in the matrix spike for batch 232198; the parent sample was not a project sample. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The sample was analyzed for leachable metals using the synthetic precipitation leachate procedure (SPLP; EPA Method 1312) with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was analyzed for the CAM 17 metals using EPA Methods 6010B/7471A. No analytical problems were encountered.

Comparison of Results to Screening Levels

The concentrations of dissolved metals are presented in Table 2 and are compared to the target leachate concentrations (TLCs) for the protection of human health and for preventing the degradation of taste and odor in drinking water. No metals were detected in the leachate at concentrations that exceed screening levels.

Total PCBs

Test 1 Narrative

The sample was prepared using EPA Method 3540 and analyzed for PCBs using EPA Method 8082. All samples underwent sulfuric acid cleanup using EPA Method 3665A. All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. No analytical problems were encountered.

Test 2 Narrative

No testing was performed for PCBs.

Comparison of Results to Screening Levels

No PCBs (as Aroclors) were detected in the sample above the method detection limit.

Total SVOCs and PAHs

Test 1 Narrative

The sample were prepared using EPA Method 3540 and analyzed for the SW-846 list of SVOCs using EPA Method 8270C and for the EPA priority list of PAHs using EPA Method 8270C-SIM. The sample extract was diluted due to high non-target analytes. The high dilution factors resulted in elevated laboratory reporting limits. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The sample were prepared using EPA Method 3545 and analyzed for the SW-846 list of SVOCs using EPA Method 8270C. The sample extract was diluted due to high non-target analytes. The high dilution factors resulted in elevated laboratory reporting limits. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Comparison of Results to Screening Levels

No SVOCs or PAHs were detected in the sample at concentrations that exceed screening levels.

Leachable SVOCs

Test 1 Narrative

The sample was tested for leachable SVOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method 3520C and analyzed for the SW846 list of SVOCs using EPA Method 8270C. Bis(2-ethylhexyl)phthalate was detected above the RL in the method blank; this analyte was not detected in the sample at or above the RL. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The sample was tested for leachable SVOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method 3520C and analyzed for the SW846 list of SVOCs using EPA Method 8270C. No analytical problems were encountered.

Comparison of Results to Screening Levels

No dissolved SVOCs were detected at concentrations that exceed screening levels.

Total VOCs

Test 1 Narrative

The sample was prepared using EPA Method 5030B and analyzed for the SW-846 list of VOCs using EPA Method 8260B. High surrogate recovery was observed for toluene-d8 and bromofluorobenzene; no target analytes were detected at or above RL in the sample. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The sample was prepared using EPA Method 5030B and analyzed for the SW-846 list of VOCs using EPA Method 8260B. . Chloromethane was detected in the method blank at levels below that detected in the sample. No other analytical problems were reported. The revised laboratory report provides the concentrations to the method detection limit instead of the reporting limit.

Comparison of Results to Screening Levels

No VOCs were detected in the sample at concentrations that exceed screening levels.

Leachable VOCs

Test 1 Narrative

The sample was tested for leachable VOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method 5030B and analyzed for VOCs using EPA Method 8260B. The extract was diluted due to foaming. These issues do not affect the validity of the results or the conclusions. No other analytical problems were encountered.

Test 2 Narrative

The sample was tested for leachable VOCs using the SPLP extraction with extraction fluid #2 (pH 5.0 reagent water). The extraction fluid was prepared using EPA Method

5030B and analyzed for VOCs using EPA Method 8260B. No analytical problems were reported. The revised laboratory report provides the concentrations to the method detection limit instead of the reporting limit.

Comparison of Results to Screening Levels

No VOCs were detected in the leachate at concentrations that exceed screening levels.

CLOSING

I appreciate the opportunity to work with you on this project. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Principal Engineer
Teter Engineering

Attachments:
References
Tables 1-3
Laboratory Reports

TABLE 1 – COMPARISON OF DETECTED TOTAL CONCENTRATIONS WITH REGULATORY LEVELS AND CA SOIL BACKGROUND CONCENTRATIONS

Class	Analyte	CAS Number	DTSC TTLC Regulatory Level (mg/kg)	Water Board ESL (mg/kg)	OEHHA CHSSL (mg/kg)	CA Surface Soil Background (mg/kg)	SP14 Pad Test 1 (mg/kg)	SP14 Pad Test 2 (mg/kg)
Metal	Barium	7440-39-3	10,000	15,000	5,200	660	**1.5 J**	< 0.49
Metal	Cobalt	75-15-0	8,000	23	660	12	**0.38 J**	**0.27**
Metal	Copper	7440-50-8	2,500	3,100	3,000	28	< 0.75	**2.56**
Metal	Lead	7439-92-1	1,000	80	80	18	**0.69 J**	< 0.49
Metal	Vanadium	7440-62-2	2,400	390	530	86	**49**	< 0.24
Metal	Zinc	7440-66-6	5,000	23,000	23,000	81	**93**	**22**
VOC	Chloromethane	74-87-3	NA	29	NA	NA	< 0.1	**0.2 B,J**
VOC	Toluene	108-88-3	NA	1,000	NA	NA	**0.041 J**	< 0.26
SVOC	Phenol	108-95-2	NA	23,000	NA	NA	**0.0024 J**	< 5.0
SVOC	Styrene	100-42-5	NA	1.5	NA	NA	**0.0082 J**	< 2.5

TABLE 2 – COMPARISON DETECTED LEACHABLE CHEMICAL CONCENTRATIONS WITH TLCs FOR THE PROTECTION OF DRINKING WATER

Class	Analyte	CAS Number	Drinking Water Goal (µg/L)	Basis	TLC For Protection of Drinking Water (µg/L)	SP14 Pad Test 1 (mg/kg)	SP14 Pad Test 2 (mg/kg)
Metal	Antimony	7440-36-0	6	RWQCB Primary MCL	120	**0.37 J**	< 15
Metal	Arsenic	7440-38-2	10	RWQCB Primary MCL	200	**0.32 J**	< 10
Metal	Barium	7440-39-3	1,000	RWQCB Primary MCL	20,000	**3.2**	< 10
Metal	Cobalt	7440-48-4	11	RWQCB Risk-Based ESL	220	**1.7**	< 10
Metal	Lead	7439-92-1	15	RWQCB Primary MCL	300	**0.48 J**	< 10
Metal	Molybdenum	7439-98-7	40	USEPA Lifetime HAL	800	**1.4 J**	< 10
Metal	Thallium	7440-28-0	2	RWQCB Primary MCL	40	**0.15 J**	< 15
Metal	Vanadium	7440-62-2	50	RWQCB Notification Level	1,000	**1.9 J**	< 10
Metal	Zinc	7440-66-6	2,000	USEPA Lifetime HAL	40,000	**100**	**117 B**

TABLE 3 - NOTES AND ABBREVIATIONS

Notes and Abbeviations

1. Target Leachate Concentrations are calculated using a DAF of 20.
2. Water Board ESL is for Residential Direct Contact Risk.

B: See Laboratory Report Narrative
BG: Background
CAS: Chemical Abstracts Service
CHSSL: California Human Health Screening Level
DAF: Dilution Attenuation Factor
ESL: Environmental Screening Level
HAL: Health Advisory Level
J: Estimated value
MCL: Maximum Contaminant Level
mg/kg: Milligram per kilogram
NA: Not Applicable
OEHHA: California Office of Environmental Health Hazard Assessment
PAHs: Polycyclic Aromatic Hydrocarbons
RL: Reporting limit
RWQCB: San Francisco Bay Regional Water Quality Control Board (Water Board)
SPLP: Synthetic Precipitation Leachate Procedure
TLC: Target Leachate Concentration
TTLC: Total Threshold Limit Concentration
USEPA: United States Environmental Protection Agency
µg/L: Micrograms per liter


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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 274217
ANALYTICAL REPORT

David Teter Consulting, LLC	Project : STANDARD
1662 Clay Street	
San Francisco, CA 94109	Level : II

Sample ID	Lab ID
BROCK SP14 PAD	274217-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 03/15/2016

John Goyette
Laboratory Director
goyette@ctberk.com
(510) 204-2233

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number: **274217**
Client: **David Teter Consulting, LLC**
Request Date: **02/16/16**
Samples Received: **02/16/16**

This data package contains sample and QC results for one foam pad sample, requested for the above referenced project on 02/16/16. The sample was received intact.

Volatile Organics by GC/MS (EPA 8260B) Miscell.:
High surrogate recovery was observed for toluene-d8 in BROCK SP14 PAD (lab # 274217-001); no target analytes were detected at or above RL in the sample. High surrogate recovery was observed for bromofluorobenzene in BROCK SP14 PAD (lab # 274217-001); no target analytes were detected at or above RL in the sample. No other analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B) SPLP Leachate:
BROCK SP14 PAD (lab # 274217-001) was diluted due to foaming. No other analytical problems were encountered.

Semivolatile Organics by GC/MS (EPA 8270C) Miscell.:
Bis(2-ethylhexyl)phthalate was detected between the MDL and the RL in the method blank for batch 232229; this analyte was not detected in the sample at or above the RL. BROCK SP14 PAD (lab # 274217-001) was diluted due to high non-target analytes. No other analytical problems were encountered.

Semivolatile Organics by GC/MS (EPA 8270C) SPLP Leachate:
Bis(2-ethylhexyl)phthalate was detected above the RL in the method blank for batch 232323; this analyte was not detected in the sample at or above the RL. No other analytical problems were encountered.

Semivolatile Organics by GC/MS SIM (EPA 8270C-SIM):
BROCK SP14 PAD (lab # 274217-001) was diluted due to high non-target analytes. No other analytical problems were encountered.

PCBs (EPA 8082):
All samples underwent sulfuric acid cleanup using EPA Method 3665A. All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. No analytical problems were encountered.

Metals (EPA 6020 and EPA 7471A) Miscell.:
Vanadium was detected at or above the RL in the CCB analyzed 02/25/16 12:55; this analyte was detected in samples at least 10 times the blank level, and affected data was qualified with "b". Vanadium was detected at or above the RL in the CCB analyzed 02/25/16 14:19; this analyte was detected in samples at least 10 times the blank level, and affected data was qualified with "b". High internal standard responses were observed for scandium in the method blank/BS/BSD for batch 232372; affected data was qualified with "b". Silver,

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number: **274217**
Client: **David Teter Consulting, LLC**
Request Date: **02/16/16**
Samples Received: **02/16/16**

Metals (EPA 6020 and EPA 7471A) Miscell.:
cadmium, and lead were detected between the MDL and the RL in the method blank for batch 232372; these analytes were not detected in the sample at or above the RL. No other analytical problems were encountered.

Metals (EPA 6020 and EPA 7470A) SPLP Leachate:
Chromium and vanadium were detected between the MDL and the RL in the method blank for batch 232235. No other analytical problems were encountered.

Hexavalent Chromium by Ion Chromatograph (EPA 7199):
No analytical problems were encountered.

Hexavalent Chromium (EPA 7196A):
Low recovery was observed for hexavalent chromium in the matrix spike for batch 232198; the parent sample was not a project sample. No other analytical problems were encountered.

CHAIN OF CUSTODY

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C&T LOGIN # 274217

Page ____ of ____

Chain of Custody # _____

Project No:

Project Name:

Project P. O. No:

EDD Format: Report Level ☒ II ☐ III ☐ IV

Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: DAN SAWYER

Report To: DAVID TETER

Company: DAVID TETER CONSULTING-LLC

Telephone: 415-889-5875

Email: david@davidteterconsulting.com

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE				
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None
	BROCK-SPH PAD	2/16/2016	13:00		X			4					

ANALYTICAL REQUEST

	CA TITLE 22 METALS (3052/6010)	HEXAVALENT CHROMIUM 3060/7196	VOCs (8260)	SVOCs (8270)	PAHs (8270-SIM)	PCB Aroclors (8082)	SPLP (pH=5.0)	SPLP TITLE 22 METALS (6020)	SPLP HEX CHROME (7199)	SPLP VOCs (8260)	SPLP SVOCs (8270)
	X	X	X	X	X	X	X	X	X	X	X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☐ On Ice
☐ Ambient

RELINQUISHED BY:
DAVID TETER DATE: 2/16/16 TIME: 14:57
DATE: TIME:
DATE: TIME:

RECEIVED BY:
DATE: 2/16/16 TIME: 14:57.
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 274217 Date Received 02/16/16 Number of coolers 0
Client David Teter Project

Date Opened 02/16 By (print) SC (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C)

☐ Temperature blank(s) included? ☐ Thermometer# ☐ IR Gun#

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? YES NO (N/A)
17. Did you document your preservative check? (pH strip lot#) YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
   If YES, Who was called? By Date:

COMMENTS

Rev 12, 12/01/15

Curtis & Tompkins, Ltd.

Detections Summary for 274217

Results for any subcontracted analyses are not included in this summary.

Client : David Teter Consulting, LLC
Project : STANDARD
Location :

Client Sample ID : BROCK SP14 PAD Laboratory Sample ID : 274217-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	27	J	50	8.7	ug/Kg	As Recd	10.00	EPA 8260B	EPA 5030B
Toluene	41	J	50	7.1	ug/Kg	As Recd	10.00	EPA 8260B	EPA 5030B
Styrene	8.2	J	50	5.8	ug/Kg	As Recd	10.00	EPA 8260B	EPA 5030B
1,2,4-Trimethylbenzene	6.8	J	50	6.0	ug/Kg	As Recd	10.00	EPA 8260B	EPA 5030B
para-Isopropyl Toluene	4.6	J	50	4.2	ug/Kg	As Recd	10.00	EPA 8260B	EPA 5030B
Phenol	2.4	J	9.4	1.6	ug/L	SPLP	1.000	EPA 8270C	EPA 3520C
bis(2-Ethylhexyl)phthalate	5.8	J	9.4	1.6	ug/L	SPLP	1.000	EPA 8270C	EPA 3520C
Barium	1.5	J	1.5	0.38	mg/Kg	As Recd	100.0	EPA 6020	EPA 3052
Cobalt	0.38	J	1.0	0.34	mg/Kg	As Recd	100.0	EPA 6020	EPA 3052
Lead	0.69	J	1.5	0.50	mg/Kg	As Recd	100.0	EPA 6020	EPA 3052
Vanadium	49		33	11	mg/Kg	As Recd	1000	EPA 6020	EPA 3052
Zinc	93		5.5	1.8	mg/Kg	As Recd	100.0	EPA 6020	EPA 3052
Antimony	0.00037	J	0.0010	0.00014	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Arsenic	0.00032	J	0.0010	0.00022	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Barium	0.0032		0.0010	0.00025	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Cobalt	0.0017		0.0010	0.00018	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Lead	0.00048	J	0.0010	0.00024	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Molybdenum	0.0014	J	0.0015	0.00050	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Thallium	0.00015	J	0.0010	0.00010	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Vanadium	0.0019		0.0010	0.00032	mg/L	SPLP	5.000	EPA 6020	EPA 200.8
Zinc	0.10		0.010	0.0025	mg/L	SPLP	5.000	EPA 6020	EPA 200.8

J = Estimated value

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Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Dil'n Fac:	10.00
Lab ID:	274217-001	Batch#:	232159
Matrix:	Miscell.	Sampled:	02/16/16
Units:	ug/Kg	Received:	02/16/16
Basis:	as received	Analyzed:	02/17/16

Analyte	Result	RL	MDL
Freon 12	ND	100	4.0
Chloromethane	ND	100	10
Vinyl Chloride	ND	100	9.3
Bromomethane	ND	100	12
Chloroethane	ND	100	5.0
Trichlorofluoromethane	ND	50	7.0
Acetone	ND	200	33
Freon 113	ND	50	4.4
1,1-Dichloroethene	ND	50	9.4
Methylene Chloride	ND	200	11
Carbon Disulfide	27 J	50	8.7
MTBE	ND	50	10
trans-1,2-Dichloroethene	ND	50	8.4
Vinyl Acetate	ND	500	7.2
1,1-Dichloroethane	ND	50	12
2-Butanone	ND	100	13
cis-1,2-Dichloroethene	ND	50	8.7
2,2-Dichloropropane	ND	50	11
Chloroform	ND	50	13
Bromochloromethane	ND	50	9.3
1,1,1-Trichloroethane	ND	50	8.1
1,1-Dichloropropene	ND	50	6.3
Carbon Tetrachloride	ND	50	4.8
1,2-Dichloroethane	ND	50	9.3
Benzene	ND	50	9.0
Trichloroethene	ND	50	8.4
1,2-Dichloropropane	ND	50	7.8
Bromodichloromethane	ND	50	8.5
Dibromomethane	ND	50	7.7
4-Methyl-2-Pentanone	ND	100	10
cis-1,3-Dichloropropene	ND	50	6.1
Toluene	41 J	50	7.1
trans-1,3-Dichloropropene	ND	50	6.5
1,1,2-Trichloroethane	ND	50	6.2
2-Hexanone	ND	100	8.8
1,3-Dichloropropane	ND	50	8.4
Tetrachloroethene	ND	50	5.2
Dibromochloromethane	ND	50	5.1
1,2-Dibromoethane	ND	50	6.5
Chlorobenzene	ND	50	6.9
1,1,1,2-Tetrachloroethane	ND	50	6.2
Ethylbenzene	ND	50	6.8
m,p-Xylenes	ND	50	13
o-Xylene	ND	50	6.3
Styrene	8.2 J	50	5.8
Bromoform	ND	50	3.9
Isopropylbenzene	ND	50	5.0
1,1,2,2-Tetrachloroethane	ND	50	4.1
1,2,3-Trichloropropane	ND	50	5.8
Propylbenzene	ND	50	4.5
Bromobenzene	ND	50	5.3

*= Value outside of QC limits; see narrative
J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Dil'n Fac:	10.00
Lab ID:	274217-001	Batch#:	232159
Matrix:	Miscell.	Sampled:	02/16/16
Units:	ug/Kg	Received:	02/16/16
Basis:	as received	Analyzed:	02/17/16

Analyte	Result	RL	MDL
1,3,5-Trimethylbenzene	ND	50	5.7
2-Chlorotoluene	ND	50	6.8
4-Chlorotoluene	ND	50	6.5
tert-Butylbenzene	ND	50	4.0
1,2,4-Trimethylbenzene	6.8 J	50	6.0
sec-Butylbenzene	ND	50	4.2
para-Isopropyl Toluene	4.6 J	50	4.2
1,3-Dichlorobenzene	ND	50	4.4
1,4-Dichlorobenzene	ND	50	5.4
n-Butylbenzene	ND	50	3.8
1,2-Dichlorobenzene	ND	50	5.3
1,2-Dibromo-3-Chloropropane	ND	50	9.4
1,2,4-Trichlorobenzene	ND	50	4.2
Hexachlorobutadiene	ND	50	3.0
Naphthalene	ND	50	10
1,2,3-Trichlorobenzene	ND	50	4.3

Surrogate	%REC	Limits
Dibromofluoromethane	114	78-134
1,2-Dichloroethane-d4	86	80-138
Toluene-d8	131 *	80-120
Bromofluorobenzene	157 *	78-123

*= Value outside of QC limits; see narrative
J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Matrix:	Soil	Batch#:	232159
Units:	ug/Kg	Analyzed:	02/17/16
Diln Fac:	1.000		

Type: BS Lab ID: QC823666

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	26.69	107	70-134
Benzene	25.00	23.28	93	80-123
Trichloroethene	25.00	23.83	95	80-128
Toluene	25.00	24.00	96	80-120
Chlorobenzene	25.00	24.09	96	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	112	78-134
1,2-Dichloroethane-d4	90	80-138
Toluene-d8	106	80-120
Bromofluorobenzene	99	78-123

Type: BSD Lab ID: QC823667

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	25.00	28.47	114	70-134	6	22
Benzene	25.00	25.46	102	80-123	9	21
Trichloroethene	25.00	25.29	101	80-128	6	23
Toluene	25.00	27.22	109	80-120	13	20
Chlorobenzene	25.00	25.98	104	80-123	8	20

Surrogate	%REC	Limits
Dibromofluoromethane	109	78-134
1,2-Dichloroethane-d4	88	80-138
Toluene-d8	108	80-120
Bromofluorobenzene	97	78-123

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC823668	Batch#:	232159
Matrix:	Soil	Analyzed:	02/17/16
Units:	ug/Kg		

Analyte	Result	RL	MDL
Freon 12	ND	10	0.4
Chloromethane	ND	10	1.0
Vinyl Chloride	ND	10	0.9
Bromomethane	ND	10	1.2
Chloroethane	ND	10	0.5
Trichlorofluoromethane	ND	5.0	0.7
Acetone	ND	20	3.3
Freon 113	ND	5.0	0.4
1,1-Dichloroethene	ND	5.0	0.9
Methylene Chloride	ND	20	1.1
Carbon Disulfide	ND	5.0	0.9
MTBE	ND	5.0	1.0
trans-1,2-Dichloroethene	ND	5.0	0.8
Vinyl Acetate	ND	50	0.7
1,1-Dichloroethane	ND	5.0	1.2
2-Butanone	ND	10	1.3
cis-1,2-Dichloroethene	ND	5.0	0.9
2,2-Dichloropropane	ND	5.0	1.1
Chloroform	ND	5.0	1.3
Bromochloromethane	ND	5.0	0.9
1,1,1-Trichloroethane	ND	5.0	0.8
1,1-Dichloropropene	ND	5.0	0.6
Carbon Tetrachloride	ND	5.0	0.5
1,2-Dichloroethane	ND	5.0	0.9
Benzene	ND	5.0	0.9
Trichloroethene	ND	5.0	0.8
1,2-Dichloropropane	ND	5.0	0.8
Bromodichloromethane	ND	5.0	0.8
Dibromomethane	ND	5.0	0.8
4-Methyl-2-Pentanone	ND	10	1.0
cis-1,3-Dichloropropene	ND	5.0	0.6
Toluene	ND	5.0	0.7
trans-1,3-Dichloropropene	ND	5.0	0.6
1,1,2-Trichloroethane	ND	5.0	0.6
2-Hexanone	ND	10	0.9
1,3-Dichloropropane	ND	5.0	0.8
Tetrachloroethene	ND	5.0	0.5
Dibromochloromethane	ND	5.0	0.5
1,2-Dibromoethane	ND	5.0	0.7
Chlorobenzene	ND	5.0	0.7
1,1,1,2-Tetrachloroethane	ND	5.0	0.6
Ethylbenzene	ND	5.0	0.7
m,p-Xylenes	ND	5.0	1.3
o-Xylene	ND	5.0	0.6
Styrene	ND	5.0	0.6
Bromoform	ND	5.0	0.4
Isopropylbenzene	ND	5.0	0.5
1,1,2,2-Tetrachloroethane	ND	5.0	0.4
1,2,3-Trichloropropane	ND	5.0	0.6
Propylbenzene	ND	5.0	0.4
Bromobenzene	ND	5.0	0.5
1,3,5-Trimethylbenzene	ND	5.0	0.6
2-Chlorotoluene	ND	5.0	0.7

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC823668	Batch#:	232159
Matrix:	Soil	Analyzed:	02/17/16
Units:	ug/Kg		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	5.0	0.6
tert-Butylbenzene	ND	5.0	0.4
1,2,4-Trimethylbenzene	ND	5.0	0.6
sec-Butylbenzene	ND	5.0	0.4
para-Isopropyl Toluene	ND	5.0	0.4
1,3-Dichlorobenzene	ND	5.0	0.4
1,4-Dichlorobenzene	ND	5.0	0.5
n-Butylbenzene	ND	5.0	0.4
1,2-Dichlorobenzene	ND	5.0	0.5
1,2-Dibromo-3-Chloropropane	ND	5.0	0.9
1,2,4-Trichlorobenzene	ND	5.0	0.4
Hexachlorobutadiene	ND	5.0	0.3
Naphthalene	ND	5.0	1.0
1,2,3-Trichlorobenzene	ND	5.0	0.4

Surrogate	%REC	Limits
Dibromofluoromethane	113	78-134
1,2-Dichloroethane-d4	86	80-138
Toluene-d8	106	80-120
Bromofluorobenzene	107	78-123

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232361
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	SPLP Leachate	Received:	02/16/16
Units:	ug/L	Analyzed:	02/24/16
Diln Fac:	36.50		

Analyte	Result	RL	MDL
Freon 12	ND	37	4.0
Chloromethane	ND	37	3.7
Vinyl Chloride	ND	18	3.7
Bromomethane	ND	37	6.1
Chloroethane	ND	37	3.7
Trichlorofluoromethane	ND	37	3.7
Acetone	ND	370	120
Freon 113	ND	73	4.5
1,1-Dichloroethene	ND	18	4.6
Methylene Chloride	ND	370	4.6
Carbon Disulfide	ND	18	3.7
MTBE	ND	18	3.7
trans-1,2-Dichloroethene	ND	18	3.7
Vinyl Acetate	ND	370	9.1
1,1-Dichloroethane	ND	18	3.7
2-Butanone	ND	370	9.1
cis-1,2-Dichloroethene	ND	18	3.7
2,2-Dichloropropane	ND	18	4.4
Chloroform	ND	18	3.7
Bromochloromethane	ND	18	5.9
1,1,1-Trichloroethane	ND	18	5.4
1,1-Dichloropropene	ND	18	3.7
Carbon Tetrachloride	ND	18	3.7
1,2-Dichloroethane	ND	18	3.7
Benzene	ND	18	3.7
Trichloroethene	ND	18	3.7
1,2-Dichloropropane	ND	18	3.7
Bromodichloromethane	ND	18	3.7
Dibromomethane	ND	18	5.3
4-Methyl-2-Pentanone	ND	370	5.7
cis-1,3-Dichloropropene	ND	18	4.1
Toluene	ND	18	3.7
trans-1,3-Dichloropropene	ND	18	3.7
1,1,2-Trichloroethane	ND	18	3.7
2-Hexanone	ND	370	6.2
1,3-Dichloropropane	ND	18	3.7
Tetrachloroethene	ND	18	3.9
Dibromochloromethane	ND	18	3.7
1,2-Dibromoethane	ND	18	4.6
Chlorobenzene	ND	18	3.7
1,1,1,2-Tetrachloroethane	ND	18	3.7
Ethylbenzene	ND	18	3.7
m,p-Xylenes	ND	18	4.8
o-Xylene	ND	18	3.7
Styrene	ND	18	5.8
Bromoform	ND	37	3.7
Isopropylbenzene	ND	18	3.7
1,1,2,2-Tetrachloroethane	ND	18	3.7
1,2,3-Trichloropropane	ND	18	3.8
Propylbenzene	ND	18	3.7
Bromobenzene	ND	18	3.7
1,3,5-Trimethylbenzene	ND	18	3.7
2-Chlorotoluene	ND	18	3.7

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232361
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	SPLP Leachate	Received:	02/16/16
Units:	ug/L	Analyzed:	02/24/16
Diln Fac:	36.50		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	18	3.7
tert-Butylbenzene	ND	18	3.7
1,2,4-Trimethylbenzene	ND	18	3.7
sec-Butylbenzene	ND	18	3.7
para-Isopropyl Toluene	ND	18	3.7
1,3-Dichlorobenzene	ND	18	3.7
1,4-Dichlorobenzene	ND	18	3.7
n-Butylbenzene	ND	18	3.7
1,2-Dichlorobenzene	ND	18	3.7
1,2-Dibromo-3-Chloropropane	ND	73	9.1
1,2,4-Trichlorobenzene	ND	18	4.4
Hexachlorobutadiene	ND	73	8.7
Naphthalene	ND	73	9.1
1,2,3-Trichlorobenzene	ND	18	4.4

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Matrix:	Water	Batch#:	232361
Units:	ug/L	Analyzed:	02/23/16
Diln Fac:	1.000		

Type: BS Lab ID: QC824479

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	12.50	13.43	107	66-135
Benzene	12.50	12.19	97	80-123
Trichloroethene	12.50	12.42	99	80-123
Toluene	12.50	11.87	95	80-121
Chlorobenzene	12.50	12.08	97	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	98	80-128
1,2-Dichloroethane-d4	96	75-139
Toluene-d8	95	80-120
Bromofluorobenzene	104	80-120

Type: BSD Lab ID: QC824480

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	12.50	12.71	102	66-135	6	24
Benzene	12.50	12.05	96	80-123	1	20
Trichloroethene	12.50	12.15	97	80-123	2	20
Toluene	12.50	11.71	94	80-121	1	20
Chlorobenzene	12.50	11.96	96	80-123	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-128
1,2-Dichloroethane-d4	93	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	102	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC824481	Batch#:	232361
Matrix:	Water	Analyzed:	02/23/16
Units:	ug/L		

Analyte	Result	RL	MDL
Freon 12	ND	1.0	0.1
Chloromethane	ND	1.0	0.1
Vinyl Chloride	ND	0.5	0.1
Bromomethane	ND	1.0	0.2
Chloroethane	ND	1.0	0.1
Trichlorofluoromethane	ND	1.0	0.1
Acetone	ND	10	3.3
Freon 113	ND	2.0	0.1
1,1-Dichloroethene	ND	0.5	0.1
Methylene Chloride	ND	10	0.1
Carbon Disulfide	ND	0.5	0.1
MTBE	ND	0.5	0.1
trans-1,2-Dichloroethene	ND	0.5	0.1
Vinyl Acetate	ND	10	0.3
1,1-Dichloroethane	ND	0.5	0.1
2-Butanone	ND	10	0.3
cis-1,2-Dichloroethene	ND	0.5	0.1
2,2-Dichloropropane	ND	0.5	0.1
Chloroform	ND	0.5	0.1
Bromochloromethane	ND	0.5	0.2
1,1,1-Trichloroethane	ND	0.5	0.1
1,1-Dichloropropene	ND	0.5	0.1
Carbon Tetrachloride	ND	0.5	0.1
1,2-Dichloroethane	ND	0.5	0.1
Benzene	ND	0.5	0.1
Trichloroethene	ND	0.5	0.1
1,2-Dichloropropane	ND	0.5	0.1
Bromodichloromethane	ND	0.5	0.1
Dibromomethane	ND	0.5	0.1
4-Methyl-2-Pentanone	ND	10	0.2
cis-1,3-Dichloropropene	ND	0.5	0.1
Toluene	ND	0.5	0.1
trans-1,3-Dichloropropene	ND	0.5	0.1
1,1,2-Trichloroethane	ND	0.5	0.1
2-Hexanone	ND	10	0.2
1,3-Dichloropropane	ND	0.5	0.1
Tetrachloroethene	ND	0.5	0.1
Dibromochloromethane	ND	0.5	0.1
1,2-Dibromoethane	ND	0.5	0.1
Chlorobenzene	ND	0.5	0.1
1,1,1,2-Tetrachloroethane	ND	0.5	0.1
Ethylbenzene	ND	0.5	0.1
m,p-Xylenes	ND	0.5	0.1
o-Xylene	ND	0.5	0.1
Styrene	ND	0.5	0.2
Bromoform	ND	1.0	0.1
Isopropylbenzene	ND	0.5	0.1
1,1,2,2-Tetrachloroethane	ND	0.5	0.1
1,2,3-Trichloropropane	ND	0.5	0.1
Propylbenzene	ND	0.5	0.1
Bromobenzene	ND	0.5	0.1
1,3,5-Trimethylbenzene	ND	0.5	0.1
2-Chlorotoluene	ND	0.5	0.1

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	274217	Prep:	EPA 5030B
Client:	David Teter Consulting, LLC	Analysis:	EPA 8260B
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC824481	Batch#:	232361
Matrix:	Water	Analyzed:	02/23/16
Units:	ug/L		

Analyte	Result	RL	MDL
4-Chlorotoluene	ND	0.5	0.1
tert-Butylbenzene	ND	0.5	0.1
1,2,4-Trimethylbenzene	ND	0.5	0.1
sec-Butylbenzene	ND	0.5	0.1
para-Isopropyl Toluene	ND	0.5	0.1
1,3-Dichlorobenzene	ND	0.5	0.1
1,4-Dichlorobenzene	ND	0.5	0.1
n-Butylbenzene	ND	0.5	0.1
1,2-Dichlorobenzene	ND	0.5	0.1
1,2-Dibromo-3-Chloropropane	ND	2.0	0.3
1,2,4-Trichlorobenzene	ND	0.5	0.1
Hexachlorobutadiene	ND	2.0	0.2
Naphthalene	ND	2.0	0.3
1,2,3-Trichlorobenzene	ND	0.5	0.1

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-128
1,2-Dichloroethane-d4	94	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232229
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	Miscell.	Received:	02/16/16
Units:	ug/Kg	Prepared:	02/18/16
Basis:	as received	Analyzed:	02/21/16
Diln Fac:	20.00		

Analyte	Result	RL	MDL
N-Nitrosodimethylamine	ND	100,000	9,900
Phenol	ND	100,000	5,200
Aniline	ND	100,000	4,000
bis(2-Chloroethyl)ether	ND	100,000	3,700
2-Chlorophenol	ND	100,000	4,900
1,3-Dichlorobenzene	ND	100,000	3,600
1,4-Dichlorobenzene	ND	100,000	3,000
Benzyl alcohol	ND	100,000	4,600
1,2-Dichlorobenzene	ND	100,000	2,800
2-Methylphenol	ND	100,000	4,600
bis(2-Chloroisopropyl) ether	ND	100,000	5,500
4-Methylphenol	ND	100,000	5,200
N-Nitroso-di-n-propylamine	ND	100,000	9,900
Hexachloroethane	ND	100,000	3,600
Nitrobenzene	ND	100,000	3,600
Isophorone	ND	100,000	3,200
2-Nitrophenol	ND	200,000	3,000
2,4-Dimethylphenol	ND	100,000	4,100
Benzoic acid	ND	500,000	150,000
bis(2-Chloroethoxy)methane	ND	100,000	3,400
2,4-Dichlorophenol	ND	100,000	3,800
1,2,4-Trichlorobenzene	ND	100,000	2,900
Naphthalene	ND	20,000	2,600
4-Chloroaniline	ND	100,000	4,900
Hexachlorobutadiene	ND	100,000	18,000
4-Chloro-3-methylphenol	ND	100,000	4,400
2-Methylnaphthalene	ND	20,000	2,900
Hexachlorocyclopentadiene	ND	500,000	18,000
2,4,6-Trichlorophenol	ND	100,000	4,200
2,4,5-Trichlorophenol	ND	100,000	2,600
2-Chloronaphthalene	ND	100,000	16,000
2-Nitroaniline	ND	200,000	9,900
Dimethylphthalate	ND	100,000	2,800
Acenaphthylene	ND	20,000	2,500
2,6-Dinitrotoluene	ND	100,000	2,600
3-Nitroaniline	ND	200,000	9,900
Acenaphthene	ND	20,000	3,600
2,4-Dinitrophenol	ND	500,000	48,000
4-Nitrophenol	ND	200,000	21,000
Dibenzofuran	ND	100,000	2,600
2,4-Dinitrotoluene	ND	100,000	2,900
Diethylphthalate	ND	100,000	2,500
Fluorene	ND	20,000	2,700
4-Chlorophenyl-phenylether	ND	100,000	2,900
4-Nitroaniline	ND	200,000	9,900
4,6-Dinitro-2-methylphenol	ND	500,000	13,000
N-Nitrosodiphenylamine	ND	100,000	17,000
Azobenzene	ND	100,000	3,600
4-Bromophenyl-phenylether	ND	100,000	17,000
Hexachlorobenzene	ND	100,000	3,600
Pentachlorophenol	ND	200,000	44,000

DO= Diluted Out
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232229
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	Miscell.	Received:	02/16/16
Units:	ug/Kg	Prepared:	02/18/16
Basis:	as received	Analyzed:	02/21/16
Diln Fac:	20.00		

Analyte	Result	RL	MDL
Phenanthrene	ND	20,000	2,900
Anthracene	ND	20,000	3,600
Di-n-butylphthalate	ND	100,000	3,600
Fluoranthene	ND	20,000	2,600
Pyrene	ND	20,000	2,800
Butylbenzylphthalate	ND	100,000	3,600
3,3'-Dichlorobenzidine	ND	200,000	13,000
Benzo(a)anthracene	ND	20,000	2,600
Chrysene	ND	20,000	3,600
bis(2-Ethylhexyl)phthalate	ND	100,000	2,600
Di-n-octylphthalate	ND	100,000	2,500
Benzo(b)fluoranthene	ND	20,000	3,600
Benzo(k)fluoranthene	ND	20,000	2,600
Benzo(a)pyrene	ND	20,000	2,600
Indeno(1,2,3-cd)pyrene	ND	20,000	3,600
Dibenz(a,h)anthracene	ND	20,000	3,600
Benzo(g,h,i)perylene	ND	20,000	2,600

Surrogate	%REC	Limits
2-Fluorophenol	DO	25-120
Phenol-d5	DO	36-120
2,4,6-Tribromophenol	DO	27-120
Nitrobenzene-d5	DO	44-120
2-Fluorobiphenyl	DO	47-120
Terphenyl-d14	DO	49-120

DO= Diluted Out
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Type:	BLANK	Dil'n Fac:	1.000
Lab ID:	QC823959	Batch#:	232229
Matrix:	Miscell.	Prepared:	02/18/16
Units:	ug/Kg	Analyzed:	02/21/16

Analyte	Result	RL	MDL
N-Nitrosodimethylamine	ND	670	66
Phenol	ND	670	35
Aniline	ND	670	27
bis(2-Chloroethyl)ether	ND	670	25
2-Chlorophenol	ND	670	33
1,3-Dichlorobenzene	ND	670	24
1,4-Dichlorobenzene	ND	670	20
Benzyl alcohol	ND	670	31
1,2-Dichlorobenzene	ND	670	19
2-Methylphenol	ND	670	31
bis(2-Chloroisopropyl) ether	ND	670	37
4-Methylphenol	ND	670	35
N-Nitroso-di-n-propylamine	ND	670	66
Hexachloroethane	ND	670	24
Nitrobenzene	ND	670	24
Isophorone	ND	670	22
2-Nitrophenol	ND	1,300	20
2,4-Dimethylphenol	ND	670	28
Benzoic acid	ND	3,300	1,000
bis(2-Chloroethoxy)methane	ND	670	23
2,4-Dichlorophenol	ND	670	25
1,2,4-Trichlorobenzene	ND	670	19
Naphthalene	ND	130	18
4-Chloroaniline	ND	670	33
Hexachlorobutadiene	ND	670	120
4-Chloro-3-methylphenol	ND	670	29
2-Methylnaphthalene	ND	130	20
Hexachlorocyclopentadiene	ND	3,300	120
2,4,6-Trichlorophenol	ND	670	28
2,4,5-Trichlorophenol	ND	670	18
2-Chloronaphthalene	ND	670	110
2-Nitroaniline	ND	1,300	66
Dimethylphthalate	ND	670	19
Acenaphthylene	ND	130	17
2,6-Dinitrotoluene	ND	670	18
3-Nitroaniline	ND	1,300	66
Acenaphthene	ND	130	24
2,4-Dinitrophenol	ND	3,300	320
4-Nitrophenol	ND	1,300	140
Dibenzofuran	ND	670	18
2,4-Dinitrotoluene	ND	670	19
Diethylphthalate	ND	670	17
Fluorene	ND	130	18
4-Chlorophenyl-phenylether	ND	670	20
4-Nitroaniline	ND	1,300	66
4,6-Dinitro-2-methylphenol	ND	3,300	84
N-Nitrosodiphenylamine	ND	670	110
Azobenzene	ND	670	24
4-Bromophenyl-phenylether	ND	670	120
Hexachlorobenzene	ND	670	24
Pentachlorophenol	ND	1,300	300
Phenanthrene	ND	130	19

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC823959	Batch#:	232229
Matrix:	Miscell.	Prepared:	02/18/16
Units:	ug/Kg	Analyzed:	02/21/16

Analyte	Result	RL	MDL
Anthracene	ND	130	24
Di-n-butylphthalate	ND	670	24
Fluoranthene	ND	130	17
Pyrene	ND	130	19
Butylbenzylphthalate	ND	670	24
3,3'-Dichlorobenzidine	ND	1,300	86
Benzo(a)anthracene	ND	130	17
Chrysene	ND	130	24
bis(2-Ethylhexyl)phthalate	30 J	670	17
Di-n-octylphthalate	ND	670	17
Benzo(b)fluoranthene	ND	130	24
Benzo(k)fluoranthene	ND	130	17
Benzo(a)pyrene	ND	130	17
Indeno(1,2,3-cd)pyrene	ND	130	24
Dibenz(a,h)anthracene	ND	130	24
Benzo(g,h,i)perylene	ND	130	17

Surrogate	%REC	Limits
2-Fluorophenol	74	25-120
Phenol-d5	75	36-120
2,4,6-Tribromophenol	73	27-120
Nitrobenzene-d5	66	44-120
2-Fluorobiphenyl	63	47-120
Terphenyl-d14	62	49-120

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Matrix:	Miscell.	Batch#:	232229
Units:	ug/Kg	Prepared:	02/18/16
Diln Fac:	1.000	Analyzed:	02/21/16

Type: BS Lab ID: QC823960

Analyte	Spiked	Result	%REC	Limits
Phenol	5,333	3,599	67	42-120
2-Chlorophenol	5,333	3,654	69	45-120
1,4-Dichlorobenzene	5,333	3,617	68	48-120
N-Nitroso-di-n-propylamine	5,333	3,676	69	27-123
1,2,4-Trichlorobenzene	5,333	3,817	72	50-120
4-Chloro-3-methylphenol	5,333	3,714	70	59-120
Acenaphthene	2,000	1,361	68	53-120
4-Nitrophenol	5,333	3,814	72	47-120
2,4-Dinitrotoluene	5,333	4,011	75	55-120
Pentachlorophenol	5,333	3,779	71	32-120
Pyrene	2,000	1,345	67	52-120

Surrogate	%REC	Limits
2-Fluorophenol	65	25-120
Phenol-d5	63	36-120
2,4,6-Tribromophenol	80	27-120
Nitrobenzene-d5	58	44-120
2-Fluorobiphenyl	57	47-120
Terphenyl-d14	54	49-120

Type: BSD Lab ID: QC823961

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Phenol	5,333	3,961	74	42-120	10	20
2-Chlorophenol	5,333	4,053	76	45-120	10	20
1,4-Dichlorobenzene	5,333	3,989	75	48-120	10	20
N-Nitroso-di-n-propylamine	5,333	4,022	75	27-123	9	20
1,2,4-Trichlorobenzene	5,333	4,092	77	50-120	7	20
4-Chloro-3-methylphenol	5,333	3,963	74	59-120	6	20
Acenaphthene	2,000	1,500	75	53-120	10	20
4-Nitrophenol	5,333	4,019	75	47-120	5	20
2,4-Dinitrotoluene	5,333	4,288	80	55-120	7	20
Pentachlorophenol	5,333	4,206	79	32-120	11	20
Pyrene	2,000	1,441	72	52-120	7	20

Surrogate	%REC	Limits
2-Fluorophenol	72	25-120
Phenol-d5	71	36-120
2,4,6-Tribromophenol	85	27-120
Nitrobenzene-d5	63	44-120
2-Fluorobiphenyl	61	47-120
Terphenyl-d14	58	49-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3520C
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232323
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	SPLP Leachate	Received:	02/16/16
Units:	ug/L	Prepared:	02/22/16
Diln Fac:	1.000	Analyzed:	02/24/16

Analyte	Result	RL	MDL
N-Nitrosodimethylamine	ND	9.4	2.2
Phenol	2.4 J	9.4	1.6
Aniline	ND	9.4	1.6
bis(2-Chloroethyl)ether	ND	9.4	1.5
2-Chlorophenol	ND	9.4	1.5
1,3-Dichlorobenzene	ND	9.4	1.5
1,4-Dichlorobenzene	ND	9.4	1.6
Benzyl alcohol	ND	9.4	1.4
1,2-Dichlorobenzene	ND	9.4	1.6
2-Methylphenol	ND	9.4	1.4
bis(2-Chloroisopropyl) ether	ND	9.4	2.6
4-Methylphenol	ND	9.4	1.4
N-Nitroso-di-n-propylamine	ND	9.4	1.9
Hexachloroethane	ND	9.4	1.6
Nitrobenzene	ND	9.4	1.5
Isophorone	ND	9.4	1.8
2-Nitrophenol	ND	19	2.4
2,4-Dimethylphenol	ND	9.4	1.2
Benzoic acid	ND	47	9.6
bis(2-Chloroethoxy)methane	ND	9.4	1.2
2,4-Dichlorophenol	ND	9.4	1.3
1,2,4-Trichlorobenzene	ND	9.4	1.3
Naphthalene	ND	9.4	1.4
4-Chloroaniline	ND	9.4	1.2
Hexachlorobutadiene	ND	9.4	1.3
4-Chloro-3-methylphenol	ND	9.4	1.3
2-Methylnaphthalene	ND	9.4	1.4
Hexachlorocyclopentadiene	ND	19	1.9
2,4,6-Trichlorophenol	ND	9.4	0.93
2,4,5-Trichlorophenol	ND	9.4	0.89
2-Chloronaphthalene	ND	9.4	1.5
2-Nitroaniline	ND	19	1.7
Dimethylphthalate	ND	9.4	1.5
Acenaphthylene	ND	9.4	1.4
2,6-Dinitrotoluene	ND	9.4	1.3
3-Nitroaniline	ND	19	0.98
Acenaphthene	ND	9.4	1.3
2,4-Dinitrophenol	ND	19	2.0
4-Nitrophenol	ND	19	1.1
Dibenzofuran	ND	9.4	1.4
2,4-Dinitrotoluene	ND	9.4	1.4
Diethylphthalate	ND	9.4	1.5
Fluorene	ND	9.4	1.5
4-Chlorophenyl-phenylether	ND	9.4	1.3
4-Nitroaniline	ND	19	1.1
4,6-Dinitro-2-methylphenol	ND	19	1.6
N-Nitrosodiphenylamine	ND	9.4	1.2
Azobenzene	ND	9.4	1.5
4-Bromophenyl-phenylether	ND	9.4	1.1
Hexachlorobenzene	ND	9.4	1.2
Pentachlorophenol	ND	19	1.2
Phenanthrene	ND	9.4	1.2

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3520C
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232323
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	SPLP Leachate	Received:	02/16/16
Units:	ug/L	Prepared:	02/22/16
Diln Fac:	1.000	Analyzed:	02/24/16

Analyte	Result	RL	MDL
Anthracene	ND	9.4	1.3
Di-n-butylphthalate	ND	9.4	1.1
Fluoranthene	ND	9.4	1.5
Benzidine	ND	47	11
Pyrene	ND	9.4	1.2
Butylbenzylphthalate	ND	9.4	1.3
3,3'-Dichlorobenzidine	ND	19	0.59
Benzo(a)anthracene	ND	9.4	1.3
Chrysene	ND	9.4	1.3
bis(2-Ethylhexyl)phthalate	5.8 J	9.4	1.6
Di-n-octylphthalate	ND	9.4	1.2
Benzo(b)fluoranthene	ND	9.4	1.3
Benzo(k)fluoranthene	ND	9.4	1.4
Benzo(a)pyrene	ND	9.4	1.1
Indeno(1,2,3-cd)pyrene	ND	9.4	1.4
Dibenz(a,h)anthracene	ND	9.4	1.3
Benzo(g,h,i)perylene	ND	9.4	1.4

Surrogate	%REC	Limits
2-Fluorophenol	85	38-120
Phenol-d5	70	38-120
2,4,6-Tribromophenol	82	46-120
Nitrobenzene-d5	75	51-120
2-Fluorobiphenyl	70	54-120
Terphenyl-d14	71	21-120

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3520C
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Type:	BLANK	Batch#:	232323
Lab ID:	QC824330	Prepared:	02/22/16
Matrix:	Water	Analyzed:	02/24/16
Units:	ug/L		

Analyte	Result	RL	MDL	Diln Fac
N-Nitrosodimethylamine	ND	10	2.3	1.000
Phenol	ND	10	1.7	1.000
Aniline	ND	10	1.7	1.000
bis(2-Chloroethyl)ether	ND	10	1.6	1.000
2-Chlorophenol	ND	10	1.6	1.000
1,3-Dichlorobenzene	ND	10	1.6	1.000
1,4-Dichlorobenzene	ND	10	1.6	1.000
Benzyl alcohol	ND	10	1.5	1.000
1,2-Dichlorobenzene	ND	10	1.7	1.000
2-Methylphenol	ND	10	1.5	1.000
bis(2-Chloroisopropyl) ether	ND	10	2.7	1.000
4-Methylphenol	ND	10	1.5	1.000
N-Nitroso-di-n-propylamine	ND	10	2.0	1.000
Hexachloroethane	ND	10	1.7	1.000
Nitrobenzene	ND	10	1.6	1.000
Isophorone	ND	10	1.9	1.000
2-Nitrophenol	ND	20	2.6	1.000
2,4-Dimethylphenol	ND	10	1.3	1.000
Benzoic acid	ND	50	10	1.000
bis(2-Chloroethoxy)methane	ND	10	1.2	1.000
2,4-Dichlorophenol	ND	10	1.3	1.000
1,2,4-Trichlorobenzene	ND	10	1.4	1.000
Naphthalene	ND	10	1.4	1.000
4-Chloroaniline	ND	10	1.3	1.000
Hexachlorobutadiene	ND	10	1.3	1.000
4-Chloro-3-methylphenol	ND	10	1.4	1.000
2-Methylnaphthalene	ND	10	1.5	1.000
Hexachlorocyclopentadiene	ND	20	2.0	1.000
2,4,6-Trichlorophenol	ND	10	0.98	1.000
2,4,5-Trichlorophenol	ND	10	0.94	1.000
2-Chloronaphthalene	ND	10	1.5	1.000
2-Nitroaniline	ND	20	1.8	1.000
Dimethylphthalate	ND	10	1.5	1.000
Acenaphthylene	ND	10	1.5	1.000
2,6-Dinitrotoluene	ND	10	1.4	1.000
3-Nitroaniline	ND	20	1.0	1.000
Acenaphthene	ND	10	1.4	1.000
2,4-Dinitrophenol	ND	20	2.1	1.000
4-Nitrophenol	ND	20	1.2	1.000
Dibenzofuran	ND	10	1.5	1.000
2,4-Dinitrotoluene	ND	10	1.5	1.000
Diethylphthalate	ND	10	1.6	1.000
Fluorene	ND	10	1.5	1.000
4-Chlorophenyl-phenylether	ND	10	1.4	1.000
4-Nitroaniline	ND	20	1.2	1.000
4,6-Dinitro-2-methylphenol	ND	20	1.7	1.000
N-Nitrosodiphenylamine	ND	10	1.2	1.000
Azobenzene	ND	10	1.6	1.000
4-Bromophenyl-phenylether	ND	10	1.2	1.000
Hexachlorobenzene	ND	10	1.2	1.000
Pentachlorophenol	ND	20	1.3	1.000
Phenanthrene	ND	10	1.3	1.000

b= See narrative
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3520C
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Type:	BLANK	Batch#:	232323
Lab ID:	QC824330	Prepared:	02/22/16
Matrix:	Water	Analyzed:	02/24/16
Units:	ug/L		

Analyte	Result	RL	MDL	Diln Fac
Anthracene	ND	10	1.3	1.000
Di-n-butylphthalate	ND	10	1.2	1.000
Fluoranthene	ND	10	1.6	1.000
Benzidine	ND	50	12	1.000
Pyrene	ND	10	1.3	1.000
Butylbenzylphthalate	ND	10	1.4	1.000
3,3'-Dichlorobenzidine	ND	20	0.63	1.000
Benzo(a)anthracene	ND	10	1.3	1.000
Chrysene	ND	10	1.4	1.000
bis(2-Ethylhexyl)phthalate	150 b	30	5.5	3.000
Di-n-octylphthalate	ND	10	1.3	1.000
Benzo(b)fluoranthene	ND	10	1.4	1.000
Benzo(k)fluoranthene	ND	10	1.5	1.000
Benzo(a)pyrene	ND	10	1.1	1.000
Indeno(1,2,3-cd)pyrene	ND	10	1.4	1.000
Dibenz(a,h)anthracene	ND	10	1.4	1.000
Benzo(g,h,i)perylene	ND	10	1.5	1.000

Surrogate	%REC	Limits	Diln Fac
2-Fluorophenol	85	38-120	1.000
Phenol-d5	81	38-120	1.000
2,4,6-Tribromophenol	80	46-120	1.000
Nitrobenzene-d5	71	51-120	1.000
2-Fluorobiphenyl	67	54-120	1.000
Terphenyl-d14	73	21-120	1.000

b= See narrative
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS

Lab #:	274217	Prep:	EPA 3520C
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C
Project#:	STANDARD		
Matrix:	Water	Batch#:	232323
Units:	ug/L	Prepared:	02/22/16
Diln Fac:	2.000	Analyzed:	02/24/16

Type: BS Lab ID: QC824331

Analyte	Spiked	Result	%REC	Limits
Phenol	80.00	65.21	82	46-120
2-Chlorophenol	80.00	65.03	81	48-120
1,4-Dichlorobenzene	80.00	58.80	73	52-120
N-Nitroso-di-n-propylamine	80.00	61.48	77	46-120
1,2,4-Trichlorobenzene	80.00	60.47	76	53-120
4-Chloro-3-methylphenol	80.00	67.26	84	40-120
Acenaphthene	30.00	28.53	95	61-120
4-Nitrophenol	80.00	65.09	81	40-120
2,4-Dinitrotoluene	80.00	66.11	83	64-120
Pentachlorophenol	80.00	65.36	82	47-120
Pyrene	30.00	27.38	91	62-120

Surrogate	%REC	Limits
2-Fluorophenol	82	38-120
Phenol-d5	79	38-120
2,4,6-Tribromophenol	81	46-120
Nitrobenzene-d5	69	51-120
2-Fluorobiphenyl	72	54-120
Terphenyl-d14	75	21-120

Type: BSD Lab ID: QC824332

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Phenol	80.00	72.07	90	46-120	10	55
2-Chlorophenol	80.00	72.61	91	48-120	11	54
1,4-Dichlorobenzene	80.00	62.65	78	52-120	6	30
N-Nitroso-di-n-propylamine	80.00	69.20	87	46-120	12	25
1,2,4-Trichlorobenzene	80.00	65.15	81	53-120	7	26
4-Chloro-3-methylphenol	80.00	76.08	95	40-120	12	54
Acenaphthene	30.00	31.58	105	61-120	10	25
4-Nitrophenol	80.00	72.18	90	40-120	10	45
2,4-Dinitrotoluene	80.00	72.70	91	64-120	9	32
Pentachlorophenol	80.00	74.05	93	47-120	12	48
Pyrene	30.00	29.90	100	62-120	9	26

Surrogate	%REC	Limits
2-Fluorophenol	88	38-120
Phenol-d5	87	38-120
2,4,6-Tribromophenol	88	46-120
Nitrobenzene-d5	76	51-120
2-Fluorobiphenyl	76	54-120
Terphenyl-d14	81	21-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Semivolatile Organics by GC/MS SIM

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C-SIM
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232230
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	Miscell.	Received:	02/16/16
Units:	ug/Kg	Prepared:	02/18/16
Basis:	as received	Analyzed:	03/01/16
Diln Fac:	20.00		

Analyte	Result	RL	MDL
Naphthalene	ND	1,500	310
Acenaphthylene	ND	1,500	310
Acenaphthene	ND	1,500	310
Fluorene	ND	1,500	310
Phenanthrene	ND	1,500	310
Anthracene	ND	1,500	310
Fluoranthene	ND	1,500	310
Pyrene	ND	1,500	310
Benzo(a)anthracene	ND	1,500	310
Chrysene	ND	1,500	310
Benzo(b)fluoranthene	ND	1,500	310
Benzo(k)fluoranthene	ND	1,500	310
Benzo(a)pyrene	ND	1,500	310
Indeno(1,2,3-cd)pyrene	ND	1,500	310
Dibenz(a,h)anthracene	ND	1,500	310
Benzo(g,h,i)perylene	ND	1,500	310

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	33-120
2-Fluorobiphenyl	DO	43-120
Terphenyl-d14	DO	38-120

DO= Diluted Out
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C-SIM
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC823962	Batch#:	232230
Matrix:	Miscell.	Prepared:	02/18/16
Units:	ug/Kg	Analyzed:	02/24/16

Analyte	Result	RL	MDL
Naphthalene	ND	10	2.4
Acenaphthylene	ND	10	2.0
Acenaphthene	ND	10	2.0
Fluorene	ND	10	2.0
Phenanthrene	ND	10	2.0
Anthracene	ND	10	2.0
Fluoranthene	ND	10	2.0
Pyrene	ND	10	2.0
Benzo(a)anthracene	ND	10	2.0
Chrysene	ND	10	2.0
Benzo(b)fluoranthene	ND	10	2.0
Benzo(k)fluoranthene	ND	10	2.0
Benzo(a)pyrene	ND	10	2.0
Indeno(1,2,3-cd)pyrene	ND	10	2.0
Dibenz(a,h)anthracene	ND	10	2.0
Benzo(g,h,i)perylene	ND	10	2.0

Surrogate	%REC	Limits
Nitrobenzene-d5	77	33-120
2-Fluorobiphenyl	66	43-120
Terphenyl-d14	60	38-120

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Semivolatile Organics by GC/MS SIM

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8270C-SIM
Project#:	STANDARD		
Matrix:	Miscell.	Batch#:	232230
Units:	ug/Kg	Prepared:	02/18/16
Diln Fac:	1.000	Analyzed:	03/01/16

Type: BS Lab ID: QC823963

Analyte	Spiked	Result	%REC	Limits
Acenaphthene	66.67	41.07	62	44-120
Pyrene	66.67	37.48	56	36-120

Surrogate	%REC	Limits
Nitrobenzene-d5	54	33-120
2-Fluorobiphenyl	48	43-120
Terphenyl-d14	39	38-120

Type: BSD Lab ID: QC823964

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Acenaphthene	66.67	43.84	66	44-120	7	20
Pyrene	66.67	41.17	62	36-120	9	20

Surrogate	%REC	Limits
Nitrobenzene-d5	59	33-120
2-Fluorobiphenyl	51	43-120
Terphenyl-d14	43	38-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Polychlorinated Biphenyls (PCBs)

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8082
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232133
Units:	ug/Kg	Sampled:	02/16/16
Basis:	as received	Received:	02/16/16
Diln Fac:	1.000	Prepared:	02/16/16

Type: SAMPLE Matrix: Miscell.
Lab ID: 274217-001 Analyzed: 02/23/16

Analyte	Result	RL	MDL
Aroclor-1016	ND	110	38
Aroclor-1221	ND	210	100
Aroclor-1232	ND	110	50
Aroclor-1242	ND	110	46
Aroclor-1248	ND	110	49
Aroclor-1254	ND	110	39
Aroclor-1260	ND	110	25

Surrogate	%REC	Limits
TCMX	80	46-141
Decachlorobiphenyl	99	25-135

Type: BLANK Matrix: Soil
Lab ID: QC823541 Analyzed: 02/17/16

Analyte	Result	RL	MDL
Aroclor-1016	ND	9.6	2.4
Aroclor-1221	ND	19	6.4
Aroclor-1232	ND	9.6	3.1
Aroclor-1242	ND	9.6	2.9
Aroclor-1248	ND	9.6	3.0
Aroclor-1254	ND	9.6	2.4
Aroclor-1260	ND	9.6	1.5

Surrogate	%REC	Limits
TCMX	111	46-141
Decachlorobiphenyl	111	25-135

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Polychlorinated Biphenyls (PCBs)

Lab #:	274217	Prep:	EPA 3540
Client:	David Teter Consulting, LLC	Analysis:	EPA 8082
Project#:	STANDARD		
Matrix:	Soil	Batch#:	232133
Units:	ug/Kg	Prepared:	02/16/16
Diln Fac:	1.000	Analyzed:	02/17/16

Type: BS Lab ID: QC823542

Analyte	Spiked	Result	%REC	Limits
Aroclor-1016	166.7	196.0	118	64-140
Aroclor-1260	166.7	189.7	114	65-146

Surrogate	%REC	Limits
TCMX	117	46-141
Decachlorobiphenyl	110	25-135

Type: BSD Lab ID: QC823543

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Aroclor-1016	166.7	184.6	111	64-140	6	35
Aroclor-1260	166.7	191.7	115	65-146	1	36

Surrogate	%REC	Limits
TCMX	114	46-141
Decachlorobiphenyl	113	25-135

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC		
Field ID:	BROCK SP14 PAD	Basis:	as received
Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	Miscell.	Received:	02/16/16
Units:	mg/Kg		

Analyte	Result	RL	MDL	Diln Fac	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	1.7	0.56	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Arsenic	ND	1.8	0.62	100.0	232372	02/23/16	02/26/16	EPA 3052	EPA 6020
Barium	1.5 J	1.5	0.38	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Beryllium	ND	1.1	0.36	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Cadmium	ND	0.94	0.21	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Chromium	ND	1.6	0.54	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Cobalt	0.38 J	1.0	0.34	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Copper	ND	2.2	0.75	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Lead	0.69 J	1.5	0.50	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Mercury	ND	0.19	0.010	1.000	232455	02/24/16	02/25/16	METHOD	EPA 7471A
Molybdenum	ND	1.7	0.56	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Nickel	ND	2.9	0.97	100.0	232372	02/23/16	02/26/16	EPA 3052	EPA 6020
Selenium	ND	1.6	0.52	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Silver	ND	0.94	0.21	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Thallium	ND	1.1	0.37	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Vanadium	49	33	11	1,000	232372	02/23/16	02/25/16	EPA 3052	EPA 6020
Zinc	93	5.5	1.8	100.0	232372	02/23/16	02/25/16	EPA 3052	EPA 6020

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 3052
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	100.0
Lab ID:	QC824517	Batch#:	232372
Matrix:	Miscell.	Prepared:	02/23/16
Units:	mg/Kg		

Analyte	Result	RL	MDL	Analyzed
Antimony	ND	1.1	0.38	02/24/16
Arsenic	ND	1.9	0.64	02/24/16
Barium	ND	1.9	0.52	02/24/16
Beryllium	ND	0.97	0.28	02/24/16
Cadmium	0.46 J	1.6	0.42	02/24/16
Chromium	ND	1.7	0.56	02/25/16
Cobalt	ND	1.1	0.35	02/25/16
Copper	ND	2.3	0.78	02/25/16
Lead	0.69 J	0.97	0.28	02/24/16
Molybdenum	ND	3.2	1.1	02/24/16
Nickel	ND	1.7	0.55	02/26/16
Selenium	ND	1.9	0.63	02/24/16
Silver	0.49 J	0.97	0.20	02/24/16
Thallium	ND	0.78	0.26	02/24/16
Vanadium	ND b	3.4	1.1	02/25/16
Zinc	ND	5.7	1.9	02/26/16

J= Estimated value
b= See narrative
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 3052
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Matrix:	Miscell.	Batch#:	232372
Units:	mg/Kg	Prepared:	02/23/16
Diln Fac:	100.0		

Type: BS Lab ID: QC824518

Analyte	Spiked	Result	%REC	Limits	Analyzed
Antimony	414.5	448.6	108	80-120	02/24/16
Arsenic	414.5	452.3	109	80-121	02/24/16
Barium	414.5	438.1	106	80-121	02/24/16
Beryllium	207.3	210.8	102	80-120	02/24/16
Cadmium	414.5	439.8	106	80-120	02/24/16
Chromium	414.5	417.7	101	80-131	02/25/16
Cobalt	414.5	421.7	102	80-132	02/25/16
Copper	414.5	413.7	100	80-137	02/25/16
Lead	414.5	479.6	116	80-125	02/24/16
Molybdenum	414.5	446.6	108	80-120	02/24/16
Nickel	414.5	416.0	100	77-141	02/26/16
Selenium	414.5	457.8	110	80-129	02/24/16
Silver	10.36	10.09	97	80-122	02/24/16
Thallium	414.5	433.6	105	80-120	02/24/16
Vanadium	414.5	394.8 b	95	80-128	02/25/16
Zinc	414.5	479.3	116	80-133	02/24/16

Type: BSD Lab ID: QC824519

Analyte	Spiked	Result	%REC	Limits	RPD	Lim	Analyzed
Antimony	381.2	380.7	100	80-120	8	20	02/24/16
Arsenic	381.2	362.4	95	80-121	14	21	02/24/16
Barium	381.2	364.9	96	80-121	10	20	02/24/16
Beryllium	190.6	184.3	97	80-120	5	20	02/24/16
Cadmium	381.2	398.5	105	80-120	1	20	02/24/16
Chromium	381.2	357.7	94	80-131	7	25	02/25/16
Cobalt	381.2	360.2	94	80-132	7	24	02/25/16
Copper	381.2	351.1	92	80-137	8	27	02/25/16
Lead	381.2	408.3	107	80-125	8	20	02/24/16
Molybdenum	381.2	367.6	96	80-120	11	20	02/24/16
Nickel	381.2	430.5	113	77-141	12	29	02/26/16
Selenium	381.2	411.1	108	80-129	2	22	02/24/16
Silver	9.531	10.65	112	80-122	14	20	02/24/16
Thallium	381.2	367.3	96	80-120	8	20	02/24/16
Vanadium	381.2	409.2 b	107	80-128	12	24	02/25/16
Zinc	381.2	392.6	103	80-133	12	23	02/24/16

b= See narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 3052
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Field ID:	ORGANIC INFILL	Dil'n Fac:	100.0
MSS Lab ID:	273840-001	Batch#:	232372
Matrix:	Miscell.	Sampled:	02/02/16
Units:	mg/Kg	Received:	02/03/16
Basis:	as received	Prepared:	02/23/16

Type: MS Lab ID: QC824520

Analyte	MSS Result	Spiked	Result	%REC	Limits	Analyzed
Antimony	<0.3963	371.0	397.8	107	21-120	02/24/16
Arsenic	<0.6710	371.0	399.4	108	75-122	02/24/16
Barium	14.57	371.0	403.8	105	54-148	02/24/16
Beryllium	<0.2886	185.5	193.0	104	80-120	02/24/16
Cadmium	<0.4445	371.0	417.8	113	80-120	02/24/16
Chromium	<0.5916	371.0	328.7	89	60-158	02/25/16
Cobalt	<0.3720	371.0	334.4	90	73-142	02/25/16
Copper	<0.8155	371.0	336.0	91	59-150	02/25/16
Lead	0.6687	371.0	425.7	115	68-137	02/24/16
Molybdenum	<1.102	371.0	389.1	105	71-120	02/24/16
Nickel	<1.057	371.0	361.3	97	57-161	02/26/16
Selenium	0.6646	371.0	402.8	108	75-128	02/24/16
Silver	0.4608	9.275	8.477	86	77-120	02/25/16
Thallium	<0.2732	371.0	380.1	102	76-120	02/24/16
Vanadium	<1.198	371.0	351.0 b	95	65-150	02/25/16
Zinc	<4.077	371.0	406.4	110	44-158	02/24/16

Type: MSD Lab ID: QC824521

Analyte	Spiked	Result	%REC	Limits	RPD	Lim	Analyzed
Antimony	401.9	378.7	94	21-120	13	29	02/24/16
Arsenic	401.9	384.2	96	75-122	12	24	02/24/16
Barium	401.9	405.4	97	54-148	7	28	02/24/16
Beryllium	201.0	182.2	91	80-120	14	20	02/24/16
Cadmium	401.9	370.6	92	80-120	20	20	02/24/16
Chromium	401.9	354.5	88	60-158	0	36	02/25/16
Cobalt	401.9	356.6	89	73-142	2	34	02/25/16
Copper	401.9	359.5	89	59-150	1	52	02/25/16
Lead	401.9	400.0	99	68-137	14	32	02/24/16
Molybdenum	401.9	359.2	89	71-120	16	20	02/24/16
Nickel	401.9	387.8	96	57-161	1	47	02/26/16
Selenium	401.9	375.7	93	75-128	15	20	02/24/16
Silver	10.05	10.21	97	77-120	11	20	02/25/16
Thallium	401.9	363.5	90	76-120	12	20	02/24/16
Vanadium	401.9	370.4 b	92	65-150	3	28	02/25/16
Zinc	401.9	390.4	97	44-158	12	33	02/24/16

b= See narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7471A
Project#:	STANDARD		
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	232455
Lab ID:	QC824895	Prepared:	02/24/16
Matrix:	Miscell.	Analyzed:	02/25/16
Units:	mg/Kg		

Result	RL	MDL
ND	0.19	0.011

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7471A
Project#:	STANDARD		
Analyte:	Mercury	Batch#:	232455
Matrix:	Miscell.	Prepared:	02/24/16
Units:	mg/Kg	Analyzed:	02/25/16
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC824896	2.073	2.009	97	80-120		
BSD	QC824897	1.906	1.992	105	80-120	8	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7471A
Project#:	STANDARD		
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ORGANIC INFILL	Batch#:	232455
MSS Lab ID:	273840-001	Sampled:	02/02/16
Matrix:	Miscell.	Received:	02/03/16
Units:	mg/Kg	Prepared:	02/24/16
Basis:	as received	Analyzed:	02/25/16

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC824898	<0.01138	1.855	1.751	94	69-142		
MSD	QC824899		2.010	1.924	96	69-142	1	36

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC		
Field ID:	BROCK SP14 PAD	Sampled:	02/16/16
Lab ID:	274217-001	Received:	02/16/16
Matrix:	SPLP Leachate	Analyzed:	02/22/16
Units:	mg/L		

Analyte	Result	RL	MDL	Diln Fac	Batch#	Prepared	Prep	Analysis
Antimony	0.00037 J	0.0010	0.00014	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Arsenic	0.00032 J	0.0010	0.00022	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Barium	0.0032	0.0010	0.00025	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Beryllium	ND	0.0010	0.00015	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Cadmium	ND	0.0010	0.00024	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Chromium	ND	0.0010	0.00025	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Cobalt	0.0017	0.0010	0.00018	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Copper	ND	0.0010	0.00023	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Lead	0.00048 J	0.0010	0.00024	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Mercury	ND	0.00020	0.000021	1.000	232304	02/22/16	METHOD	EPA 7470A
Molybdenum	0.0014 J	0.0015	0.00050	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Nickel	ND	0.0010	0.00016	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Selenium	ND	0.0010	0.00032	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Silver	ND	0.0010	0.00012	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Thallium	0.00015 J	0.0010	0.00010	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Vanadium	0.0019	0.0010	0.00032	5.000	232235	02/18/16	EPA 200.8	EPA 6020
Zinc	0.10	0.010	0.0025	5.000	232235	02/18/16	EPA 200.8	EPA 6020

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 200.8
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Type:	BLANK	Diln Fac:	5.000
Lab ID:	QC823988	Batch#:	232235
Matrix:	SPLP Leachate	Prepared:	02/18/16
Units:	mg/L	Analyzed:	02/22/16

Analyte	Result	RL	MDL
Antimony	ND	0.0010	0.00014
Arsenic	ND	0.0010	0.00022
Barium	ND	0.0010	0.00025
Beryllium	ND	0.0010	0.00015
Cadmium	ND	0.0010	0.00024
Chromium	0.00056 J	0.0010	0.00025
Cobalt	ND	0.0010	0.00018
Copper	ND	0.0010	0.00023
Lead	ND	0.0010	0.00024
Molybdenum	ND	0.0015	0.00050
Nickel	ND	0.0010	0.00016
Selenium	ND	0.0010	0.00032
Silver	ND	0.0010	0.00012
Thallium	ND	0.0010	0.00010
Vanadium	0.00090 J	0.0010	0.00032
Zinc	ND	0.010	0.0025

J= Estimated value
ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 200.8
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Matrix:	SPLP Leachate	Batch#:	232235
Units:	mg/L	Prepared:	02/18/16
Diln Fac:	5.000	Analyzed:	02/22/16

Type: BS Lab ID: QC823989

Analyte	Spiked	Result	%REC	Limits
Antimony	0.1000	0.09500	95	80-120
Arsenic	0.1000	0.1008	101	80-120
Barium	0.1000	0.1021	102	80-120
Beryllium	0.1000	0.09625	96	80-120
Cadmium	0.1000	0.09865	99	80-120
Chromium	0.1000	0.1009	101	80-121
Cobalt	0.1000	0.1035	104	80-123
Copper	0.1000	0.09635	96	80-130
Lead	0.1000	0.1004	100	80-122
Molybdenum	0.1000	0.1002	100	80-120
Nickel	0.1000	0.09980	100	80-129
Selenium	0.1000	0.1040	104	80-126
Silver	0.1000	0.09670	97	79-120
Thallium	0.05000	0.04677	94	80-120
Vanadium	0.1000	0.1011	101	80-120
Zinc	0.1000	0.1016	102	80-130

Type: BSD Lab ID: QC823990

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	0.1000	0.09600	96	80-120	1	20
Arsenic	0.1000	0.1016	102	80-120	1	20
Barium	0.1000	0.1023	102	80-120	0	20
Beryllium	0.1000	0.09790	98	80-120	2	20
Cadmium	0.1000	0.1020	102	80-120	3	20
Chromium	0.1000	0.1035	104	80-121	3	20
Cobalt	0.1000	0.1055	106	80-123	2	20
Copper	0.1000	0.09875	99	80-130	2	20
Lead	0.1000	0.1029	103	80-122	2	20
Molybdenum	0.1000	0.1017	102	80-120	1	20
Nickel	0.1000	0.1015	101	80-129	2	23
Selenium	0.1000	0.1067	107	80-126	3	20
Silver	0.1000	0.09870	99	79-120	2	20
Thallium	0.05000	0.04748	95	80-120	2	20
Vanadium	0.1000	0.1024	102	80-120	1	20
Zinc	0.1000	0.1012	101	80-130	0	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	EPA 200.8
Client:	David Teter Consulting, LLC	Analysis:	EPA 6020
Project#:	STANDARD		
Field ID:	BROCK SP14 PAD	Batch#:	232235
MSS Lab ID:	274217-001	Sampled:	02/16/16
Matrix:	SPLP Leachate	Received:	02/16/16
Units:	mg/L	Prepared:	02/18/16
Diln Fac:	5.000	Analyzed:	02/22/16

Type: MS Lab ID: QC823991

Analyte	MSS Result	Spiked	Result	%REC	Limits
Antimony	0.0003680	0.1000	0.09585	95	75-120
Arsenic	0.0003200	0.1000	0.1017	101	80-120
Barium	0.003177	0.1000	0.1061	103	80-122
Beryllium	<0.0001508	0.1000	0.09900	99	80-121
Cadmium	<0.0002426	0.1000	0.1018	102	80-120
Chromium	<0.0002500	0.1000	0.1023	102	80-122
Cobalt	0.001711	0.1000	0.1061	104	80-121
Copper	<0.0002305	0.1000	0.09840	98	76-124
Lead	0.0004765	0.1000	0.1028	102	80-120
Molybdenum	0.001438	0.1000	0.1010	100	80-120
Nickel	<0.0001570	0.1000	0.1012	101	79-126
Selenium	<0.0003177	0.1000	0.1036	104	77-125
Silver	<0.0001230	0.1000	0.09835	98	66-120
Thallium	0.0001545	0.05000	0.04555	91	80-120
Vanadium	0.001871	0.1000	0.1027	101	80-121
Zinc	0.1004	0.1000	0.2012	101	75-126

Type: MSD Lab ID: QC823992

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	0.1000	0.09760	97	75-120	2	20
Arsenic	0.1000	0.1036	103	80-120	2	26
Barium	0.1000	0.1069	104	80-122	1	28
Beryllium	0.1000	0.09965	100	80-121	1	23
Cadmium	0.1000	0.1009	101	80-120	1	21
Chromium	0.1000	0.1043	104	80-122	2	30
Cobalt	0.1000	0.1077	106	80-121	1	25
Copper	0.1000	0.09965	100	76-124	1	29
Lead	0.1000	0.1044	104	80-120	1	20
Molybdenum	0.1000	0.1020	101	80-120	1	20
Nickel	0.1000	0.1024	102	79-126	1	30
Selenium	0.1000	0.1057	106	77-125	2	28
Silver	0.1000	0.09990	100	66-120	2	29
Thallium	0.05000	0.04166	83	80-120	9	20
Vanadium	0.1000	0.1043	102	80-121	2	31
Zinc	0.1000	0.2065	106	75-126	3	27

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7470A
Project#:	STANDARD		
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	232304
Lab ID:	QC824264	Prepared:	02/22/16
Matrix:	SPLP Leachate	Analyzed:	02/22/16
Units:	mg/L		

Result	RL	MDL
ND	0.00020	0.000021

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7470A
Project#:	STANDARD		
Analyte:	Mercury	Batch#:	232304
Matrix:	Water	Prepared:	02/22/16
Units:	mg/L	Analyzed:	02/22/16
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC824266	0.002500	0.002680	107	80-120		
BSD	QC824267	0.002500	0.002673	107	80-120	0	24

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	274217	Prep:	METHOD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7470A
Project#:	STANDARD		
Analyte:	Mercury	Batch#:	232304
Field ID:	ZZZZZZZZZZ	Sampled:	02/19/16
MSS Lab ID:	274356-001	Received:	02/19/16
Matrix:	Water	Prepared:	02/22/16
Units:	mg/L	Analyzed:	02/22/16
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC824268	<0.00002080	0.002500	0.002537	101	60-130		
MSD	QC824269		0.002500	0.002542	102	60-130	0	34

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Hexavalent Chromium

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7199
Field ID:	BROCK SP14 PAD	Batch#:	232254
Units:	ug/L	Sampled:	02/16/16 13:00
Diln Fac:	1.000	Received:	02/16/16

Type:	SAMPLE	Matrix:	SPLP Leachate
Lab ID:	274217-001	Analyzed:	02/19/16 12:50

Analyte	Result	RL	MDL
Hexavalent Chromium	ND	0.50	0.080

Type:	BLANK	Matrix:	Water
Lab ID:	QC824050	Analyzed:	02/19/16 11:49

Analyte	Result	RL	MDL
Hexavalent Chromium	ND	0.50	0.080

ND= Not Detected at or above MDL
RL= Reporting Limit
MDL= Method Detection Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Hexavalent Chromium

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7199
Field ID:	ZZZZZZZZZZ	Batch#:	232254
MSS Lab ID:	274359-010	Sampled:	02/19/16 08:15
Matrix:	Water	Received:	02/19/16
Units:	ug/L		

Type:	LCS	Diln Fac:	1.000
Lab ID:	QC824051	Analyzed:	02/19/16 12:01

Analyte	Spiked	Result	%REC	Limits
Hexavalent Chromium	10.00	9.721	97	90-110

Type:	MS	Diln Fac:	5.000
Lab ID:	QC824127	Analyzed:	02/19/16 17:06

Analyte	MSS Result	Spiked	Result	%REC	Limits
Hexavalent Chromium	4.200	50.00	51.09	94	85-115

Type:	MSD	Diln Fac:	5.000
Lab ID:	QC824128	Analyzed:	02/19/16 17:18

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Hexavalent Chromium	50.00	51.74	95	85-115	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Hexavalent Chromium

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7196A
Analyte:	Hexavalent Chromium	Batch#:	232198
Field ID:	BROCK SP14 PAD	Sampled:	02/16/16 13:00
Units:	mg/Kg	Received:	02/16/16
Basis:	as received	Prepared:	02/18/16 10:00
Diln Fac:	1.000	Analyzed:	02/18/16 15:00

Type	Lab ID	Matrix	Result	RL
SAMPLE	274217-001	Miscell.	ND	0.40
BLANK	QC823818	Soil	ND	0.40

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Hexavalent Chromium

Lab #:	274217	Project#:	STANDARD
Client:	David Teter Consulting, LLC	Analysis:	EPA 7196A
Analyte:	Hexavalent Chromium	Batch#:	232198
Field ID:	ZZZZZZZZZZ	Sampled:	02/11/16 11:00
MSS Lab ID:	274184-005	Received:	02/12/16
Matrix:	Soil	Prepared:	02/18/16 10:00
Units:	mg/Kg	Analyzed:	02/18/16 15:00
Basis:	as received		

Type	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim	Diln Fac
LCS	QC823819		40.00	39.36		98	80-120			1.000
LCS	QC823820		913.9	946.2		104	80-120			95.00
SDUP	QC823821	0.2800		0.3600 J	0.4000			25	30	1.000
SSPIKE	QC823822	0.2800	40.00	37.36		93	75-125			1.000
SSPIKE	QC823823	0.2800	682.2	486.4		71 *	75-125			95.00
SSPIKE	QC823824	0.2800	40.00	38.72		96	75-125			1.000

*= Value outside of QC limits; see narrative
J= Estimated value
RL= Reporting Limit
RPD= Relative Percent Difference

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WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 02/24/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Brock International	Work Order:	15-02-0865
	2840 Wilderness Place	Project Name:	POWERBASE / SP ANALYTICAL TESTING
	Boulder, CO 80301-5414	PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:09**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	ND	0.244	0.976	
Copper	1.46	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	8.94	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 21:11**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.732	0.976	
Arsenic	ND	0.732	0.976	
Barium	ND	0.488	0.976	
Beryllium	ND	0.244	0.976	
Cadmium	ND	0.488	0.976	
Chromium	ND	0.244	0.976	
Cobalt	0.273	0.244	0.976	
Copper	2.56	0.488	0.976	
Lead	ND	0.488	0.976	
Molybdenum	ND	0.244	0.976	
Nickel	ND	0.244	0.976	
Selenium	ND	0.732	0.976	
Silver	ND	0.244	0.976	
Thallium	ND	0.732	0.976	
Vanadium	ND	0.244	0.976	
Zinc	22.0	0.976	0.976	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3050B
Method: EPA 6010B
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-01-002-20403**	**N/A**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:23**	**150217L04**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.743	0.990	
Arsenic	ND	0.743	0.990	
Barium	ND	0.495	0.990	
Beryllium	ND	0.248	0.990	
Cadmium	ND	0.495	0.990	
Chromium	ND	0.248	0.990	
Cobalt	ND	0.248	0.990	
Copper	ND	0.495	0.990	
Lead	ND	0.495	0.990	
Molybdenum	ND	0.248	0.990	
Nickel	ND	0.248	0.990	
Selenium	ND	0.743	0.990	
Silver	ND	0.248	0.990	
Thallium	ND	0.743	0.990	
Vanadium	ND	0.248	0.990	
Zinc	ND	0.990	0.990	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0816	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:48**	**150216LA3**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.117	0.0100	0.100	B

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 6010B
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-021-1471**	**N/A**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:28**	**150216LA3**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.0150	0.100	
Arsenic	ND	0.0100	0.100	
Barium	ND	0.100	0.100	
Beryllium	ND	0.0100	0.100	
Cadmium	ND	0.0100	0.100	
Chromium	ND	0.0100	0.100	
Cobalt	ND	0.0100	0.100	
Copper	ND	0.0100	0.100	
Lead	ND	0.0100	0.100	
Molybdenum	ND	0.0100	0.100	
Nickel	ND	0.0100	0.100	
Selenium	ND	0.0150	0.100	
Silver	ND	0.00500	0.100	
Thallium	ND	0.0150	0.100	
Vanadium	ND	0.0100	0.100	
Zinc	0.0128	0.0100	0.100	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A
Units: mg/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:08**	**150218L05**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-04-005-921**	**N/A**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:52**	**150218L05**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.00500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 7471A Total
Method: EPA 7471A
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:58**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 14:00**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0862	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-272-989**	**N/A**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:20**	**150218L01**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:40**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	4.9	1.00	
Acenaphthylene	ND	4.9	1.00	
Aniline	ND	4.9	1.00	
Anthracene	ND	4.9	1.00	
Azobenzene	ND	4.9	1.00	
Benzidine	ND	98	1.00	
Benzo (a) Anthracene	ND	4.9	1.00	
Benzo (a) Pyrene	ND	4.9	1.00	
Benzo (b) Fluoranthene	ND	4.9	1.00	
Benzo (g,h,i) Perylene	ND	4.9	1.00	
Benzo (k) Fluoranthene	ND	4.9	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	4.9	1.00	
Bis(2-Chloroethoxy) Methane	ND	4.9	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	4.9	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	4.9	1.00	
4-Bromophenyl-Phenyl Ether	ND	4.9	1.00	
Butyl Benzyl Phthalate	ND	4.9	1.00	
4-Chloro-3-Methylphenol	ND	4.9	1.00	
4-Chloroaniline	ND	4.9	1.00	
2-Chloronaphthalene	ND	4.9	1.00	
2-Chlorophenol	ND	4.9	1.00	
4-Chlorophenyl-Phenyl Ether	ND	4.9	1.00	
Chrysene	ND	4.9	1.00	
Di-n-Butyl Phthalate	ND	4.9	1.00	
Di-n-Octyl Phthalate	ND	4.9	1.00	
Dibenz (a,h) Anthracene	ND	4.9	1.00	
Dibenzofuran	ND	4.9	1.00	
1,2-Dichlorobenzene	ND	4.9	1.00	
1,3-Dichlorobenzene	ND	4.9	1.00	
1,4-Dichlorobenzene	ND	4.9	1.00	
3,3'-Dichlorobenzidine	ND	98	1.00	
2,4-Dichlorophenol	ND	4.9	1.00	
Diethyl Phthalate	ND	4.9	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	4.9	1.00	
2,4-Dimethylphenol	ND	4.9	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	4.9	1.00	
2,6-Dinitrotoluene	ND	4.9	1.00	
Fluoranthene	ND	4.9	1.00	
Fluorene	ND	4.9	1.00	
Hexachloro-1,3-Butadiene	ND	4.9	1.00	
Hexachlorobenzene	ND	4.9	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	4.9	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	4.9	1.00	
Isophorone	ND	4.9	1.00	
2-Methylnaphthalene	ND	4.9	1.00	
1-Methylnaphthalene	ND	4.9	1.00	
2-Methylphenol	ND	4.9	1.00	
3/4-Methylphenol	ND	4.9	1.00	
N-Nitroso-di-n-propylamine	ND	4.9	1.00	
N-Nitrosodimethylamine	ND	4.9	1.00	
N-Nitrosodiphenylamine	ND	4.9	1.00	
Naphthalene	ND	4.9	1.00	
4-Nitroaniline	ND	4.9	1.00	
3-Nitroaniline	ND	4.9	1.00	
2-Nitroaniline	ND	4.9	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	4.9	1.00	
2-Nitrophenol	ND	4.9	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	4.9	1.00	
Phenol	ND	4.9	1.00	
Pyrene	ND	4.9	1.00	
Pyridine	ND	4.9	1.00	
1,2,4-Trichlorobenzene	ND	4.9	1.00	
2,4,6-Trichlorophenol	ND	4.9	1.00	
2,4,5-Trichlorophenol	ND	4.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	83	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	86	25-120	
Nitrobenzene-d5	72	33-123	
p-Terphenyl-d14	84	27-159	
Phenol-d6	86	26-122	
2,4,6-Tribromophenol	90	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 17:58**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	5.0	1.00	
Acenaphthylene	ND	5.0	1.00	
Aniline	ND	5.0	1.00	
Anthracene	ND	5.0	1.00	
Azobenzene	ND	5.0	1.00	
Benzidine	ND	100	1.00	
Benzo (a) Anthracene	ND	5.0	1.00	
Benzo (a) Pyrene	ND	5.0	1.00	
Benzo (b) Fluoranthene	ND	5.0	1.00	
Benzo (g,h,i) Perylene	ND	5.0	1.00	
Benzo (k) Fluoranthene	ND	5.0	1.00	
Benzoic Acid	ND	25	1.00	
Benzyl Alcohol	ND	5.0	1.00	
Bis(2-Chloroethoxy) Methane	ND	5.0	1.00	
Bis(2-Chloroethyl) Ether	ND	25	1.00	
Bis(2-Chloroisopropyl) Ether	ND	5.0	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	5.0	1.00	
4-Bromophenyl-Phenyl Ether	ND	5.0	1.00	
Butyl Benzyl Phthalate	ND	5.0	1.00	
4-Chloro-3-Methylphenol	ND	5.0	1.00	
4-Chloroaniline	ND	5.0	1.00	
2-Chloronaphthalene	ND	5.0	1.00	
2-Chlorophenol	ND	5.0	1.00	
4-Chlorophenyl-Phenyl Ether	ND	5.0	1.00	
Chrysene	ND	5.0	1.00	
Di-n-Butyl Phthalate	ND	5.0	1.00	
Di-n-Octyl Phthalate	ND	5.0	1.00	
Dibenz (a,h) Anthracene	ND	5.0	1.00	
Dibenzofuran	ND	5.0	1.00	
1,2-Dichlorobenzene	ND	5.0	1.00	
1,3-Dichlorobenzene	ND	5.0	1.00	
1,4-Dichlorobenzene	ND	5.0	1.00	
3,3'-Dichlorobenzidine	ND	100	1.00	
2,4-Dichlorophenol	ND	5.0	1.00	
Diethyl Phthalate	ND	5.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	5.0	1.00	
2,4-Dimethylphenol	ND	5.0	1.00	
4,6-Dinitro-2-Methylphenol	ND	25	1.00	
2,4-Dinitrophenol	ND	25	1.00	
2,4-Dinitrotoluene	ND	5.0	1.00	
2,6-Dinitrotoluene	ND	5.0	1.00	
Fluoranthene	ND	5.0	1.00	
Fluorene	ND	5.0	1.00	
Hexachloro-1,3-Butadiene	ND	5.0	1.00	
Hexachlorobenzene	ND	5.0	1.00	
Hexachlorocyclopentadiene	ND	25	1.00	
Hexachloroethane	ND	5.0	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	5.0	1.00	
Isophorone	ND	5.0	1.00	
2-Methylnaphthalene	ND	5.0	1.00	
1-Methylnaphthalene	ND	5.0	1.00	
2-Methylphenol	ND	5.0	1.00	
3/4-Methylphenol	ND	5.0	1.00	
N-Nitroso-di-n-propylamine	ND	5.0	1.00	
N-Nitrosodimethylamine	ND	5.0	1.00	
N-Nitrosodiphenylamine	ND	5.0	1.00	
Naphthalene	ND	5.0	1.00	
4-Nitroaniline	ND	5.0	1.00	
3-Nitroaniline	ND	5.0	1.00	
2-Nitroaniline	ND	5.0	1.00	
Nitrobenzene	ND	25	1.00	
4-Nitrophenol	ND	5.0	1.00	
2-Nitrophenol	ND	5.0	1.00	
Pentachlorophenol	ND	25	1.00	
Phenanthrene	ND	5.0	1.00	
Phenol	ND	5.0	1.00	
Pyrene	ND	5.0	1.00	
Pyridine	ND	5.0	1.00	
1,2,4-Trichlorobenzene	ND	5.0	1.00	
2,4,6-Trichlorophenol	ND	5.0	1.00	
2,4,5-Trichlorophenol	ND	5.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	87	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	93	25-120	
Nitrobenzene-d5	76	33-123	
p-Terphenyl-d14	89	27-159	
Phenol-d6	93	26-122	
2,4,6-Tribromophenol	95	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-549-3208**	**N/A**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 13:33**	**150221L09**

Parameter	Result	RL	DF	Qualifiers
Acenaphthene	ND	0.50	1.00	
Acenaphthylene	ND	0.50	1.00	
Aniline	ND	0.50	1.00	
Anthracene	ND	0.50	1.00	
Azobenzene	ND	0.50	1.00	
Benzidine	ND	10	1.00	
Benzo (a) Anthracene	ND	0.50	1.00	
Benzo (a) Pyrene	ND	0.50	1.00	
Benzo (b) Fluoranthene	ND	0.50	1.00	
Benzo (g,h,i) Perylene	ND	0.50	1.00	
Benzo (k) Fluoranthene	ND	0.50	1.00	
Benzoic Acid	ND	2.5	1.00	
Benzyl Alcohol	ND	0.50	1.00	
Bis(2-Chloroethoxy) Methane	ND	0.50	1.00	
Bis(2-Chloroethyl) Ether	ND	2.5	1.00	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	0.50	1.00	
4-Bromophenyl-Phenyl Ether	ND	0.50	1.00	
Butyl Benzyl Phthalate	ND	0.50	1.00	
4-Chloro-3-Methylphenol	ND	0.50	1.00	
4-Chloroaniline	ND	0.50	1.00	
2-Chloronaphthalene	ND	0.50	1.00	
2-Chlorophenol	ND	0.50	1.00	
4-Chlorophenyl-Phenyl Ether	ND	0.50	1.00	
Chrysene	ND	0.50	1.00	
Di-n-Butyl Phthalate	ND	0.50	1.00	
Di-n-Octyl Phthalate	ND	0.50	1.00	
Dibenz (a,h) Anthracene	ND	0.50	1.00	
Dibenzofuran	ND	0.50	1.00	
1,2-Dichlorobenzene	ND	0.50	1.00	
1,3-Dichlorobenzene	ND	0.50	1.00	
1,4-Dichlorobenzene	ND	0.50	1.00	
3,3'-Dichlorobenzidine	ND	10	1.00	
2,4-Dichlorophenol	ND	0.50	1.00	
Diethyl Phthalate	ND	0.50	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 3545
Method: EPA 8270C
Units: mg/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	0.50	1.00	
2,4-Dimethylphenol	ND	0.50	1.00	
4,6-Dinitro-2-Methylphenol	ND	2.5	1.00	
2,4-Dinitrophenol	ND	2.5	1.00	
2,4-Dinitrotoluene	ND	0.50	1.00	
2,6-Dinitrotoluene	ND	0.50	1.00	
Fluoranthene	ND	0.50	1.00	
Fluorene	ND	0.50	1.00	
Hexachloro-1,3-Butadiene	ND	0.50	1.00	
Hexachlorobenzene	ND	0.50	1.00	
Hexachlorocyclopentadiene	ND	2.5	1.00	
Hexachloroethane	ND	0.50	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	0.50	1.00	
Isophorone	ND	0.50	1.00	
2-Methylnaphthalene	ND	0.50	1.00	
1-Methylnaphthalene	ND	0.50	1.00	
2-Methylphenol	ND	0.50	1.00	
3/4-Methylphenol	ND	0.50	1.00	
N-Nitroso-di-n-propylamine	ND	0.50	1.00	
N-Nitrosodimethylamine	ND	0.50	1.00	
N-Nitrosodiphenylamine	ND	0.50	1.00	
Naphthalene	ND	0.50	1.00	
4-Nitroaniline	ND	0.50	1.00	
3-Nitroaniline	ND	0.50	1.00	
2-Nitroaniline	ND	0.50	1.00	
Nitrobenzene	ND	2.5	1.00	
4-Nitrophenol	ND	0.50	1.00	
2-Nitrophenol	ND	0.50	1.00	
Pentachlorophenol	ND	2.5	1.00	
Phenanthrene	ND	0.50	1.00	
Phenol	ND	0.50	1.00	
Pyrene	ND	0.50	1.00	
Pyridine	ND	0.50	1.00	
1,2,4-Trichlorobenzene	ND	0.50	1.00	
2,4,6-Trichlorophenol	ND	0.50	1.00	
2,4,5-Trichlorophenol	ND	0.50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	89	27-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 3545
	Method:	EPA 8270C
	Units:	mg/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	92	25-120	
Nitrobenzene-d5	80	33-123	
p-Terphenyl-d14	91	27-159	
Phenol-d6	92	26-122	
2,4,6-Tribromophenol	88	18-138	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 3 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	
Phenol-d6	34	10-94	
Nitrobenzene-d5	71	35-114	
2-Fluorobiphenyl	72	43-116	
2,4,6-Tribromophenol	83	10-123	
p-Terphenyl-d14	71	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:43**	**150220L11**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 5 of 9

Parameter	Result	RL	DF	Qualifiers
Dimethyl Phthalate	ND	250	1.00	
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	55	21-100	
Phenol-d6	36	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	77	43-116	
2,4,6-Tribromophenol	85	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-025-182**	**N/A**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:07**	**150220L11**

Parameter	Result	RL	DF	Qualifiers
N-Nitrosodimethylamine	ND	250	1.00	
Aniline	ND	250	1.00	
Pyridine	ND	250	1.00	
Phenol	ND	250	1.00	
Bis(2-Chloroethyl) Ether	ND	250	1.00	
2-Chlorophenol	ND	250	1.00	
1,3-Dichlorobenzene	ND	250	1.00	
1,4-Dichlorobenzene	ND	250	1.00	
Benzyl Alcohol	ND	250	1.00	
1,2-Dichlorobenzene	ND	250	1.00	
2-Methylphenol	ND	250	1.00	
Bis(2-Chloroisopropyl) Ether	ND	250	1.00	
3/4-Methylphenol	ND	250	1.00	
N-Nitroso-di-n-propylamine	ND	250	1.00	
Hexachloroethane	ND	250	1.00	
Nitrobenzene	ND	250	1.00	
Isophorone	ND	250	1.00	
2-Nitrophenol	ND	250	1.00	
2,4-Dimethylphenol	ND	250	1.00	
Benzoic Acid	ND	500	1.00	
Bis(2-Chloroethoxy) Methane	ND	250	1.00	
2,4-Dichlorophenol	ND	250	1.00	
1,2,4-Trichlorobenzene	ND	250	1.00	
1-Methylnaphthalene	ND	250	1.00	
Naphthalene	ND	250	1.00	
4-Chloroaniline	ND	500	1.00	
Hexachloro-1,3-Butadiene	ND	250	1.00	
4-Chloro-3-Methylphenol	ND	250	1.00	
2-Methylnaphthalene	ND	250	1.00	
Hexachlorocyclopentadiene	ND	2500	1.00	
2,4,6-Trichlorophenol	ND	250	1.00	
2,4,5-Trichlorophenol	ND	250	1.00	
2-Chloronaphthalene	ND	250	1.00	
2-Nitroaniline	ND	250	1.00	
Dimethyl Phthalate	ND	250	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8270C
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
Acenaphthylene	ND	250	1.00	
3-Nitroaniline	ND	250	1.00	
Acenaphthene	ND	250	1.00	
2,4-Dinitrophenol	ND	500	1.00	
4-Nitrophenol	ND	500	1.00	
Dibenzofuran	ND	250	1.00	
2,4-Dinitrotoluene	ND	130	1.00	
2,6-Dinitrotoluene	ND	250	1.00	
Diethyl Phthalate	ND	250	1.00	
4-Chlorophenyl-Phenyl Ether	ND	250	1.00	
Fluorene	ND	250	1.00	
4-Nitroaniline	ND	250	1.00	
Azobenzene	ND	250	1.00	
4,6-Dinitro-2-Methylphenol	ND	500	1.00	
N-Nitrosodiphenylamine	ND	250	1.00	
4-Bromophenyl-Phenyl Ether	ND	250	1.00	
Hexachlorobenzene	ND	130	1.00	
Pentachlorophenol	ND	500	1.00	
Phenanthrene	ND	250	1.00	
Anthracene	ND	250	1.00	
Di-n-Butyl Phthalate	ND	250	1.00	
Fluoranthene	ND	250	1.00	
Benzidine	ND	500	1.00	
Pyrene	ND	250	1.00	
Butyl Benzyl Phthalate	ND	250	1.00	
3,3'-Dichlorobenzidine	ND	250	1.00	
Benzo (a) Anthracene	ND	250	1.00	
Bis(2-Ethylhexyl) Phthalate	ND	250	1.00	
Chrysene	ND	250	1.00	
Di-n-Octyl Phthalate	ND	250	1.00	
Benzo (k) Fluoranthene	ND	250	1.00	
Benzo (b) Fluoranthene	ND	250	1.00	
Benzo (a) Pyrene	ND	250	1.00	
Dibenz (a,h) Anthracene	ND	250	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	250	1.00	
Benzo (g,h,i) Perylene	ND	250	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorophenol	53	21-100	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 1312
	Method:	EPA 8270C
	Units:	ug/L
Project: POWERBASE / SP ANALYTICAL TESTING		Page 9 of 9

Surrogate	Rec. (%)	Control Limits	Qualifiers
Phenol-d6	33	10-94	
Nitrobenzene-d5	70	35-114	
2-Fluorobiphenyl	71	43-116	
2,4,6-Tribromophenol	82	10-123	
p-Terphenyl-d14	70	33-141	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	62000	50.0	
Benzene	ND	2500	50.0	
Bromobenzene	ND	2500	50.0	
Bromochloromethane	ND	2500	50.0	
Bromodichloromethane	ND	2500	50.0	
Bromoform	ND	2500	50.0	
Bromomethane	ND	12000	50.0	
2-Butanone	ND	25000	50.0	
n-Butylbenzene	ND	2500	50.0	
sec-Butylbenzene	ND	2500	50.0	
tert-Butylbenzene	ND	2500	50.0	
Carbon Disulfide	ND	25000	50.0	
Carbon Tetrachloride	ND	2500	50.0	
Chlorobenzene	ND	2500	50.0	
Chloroethane	ND	2500	50.0	
Chloroform	ND	2500	50.0	
Chloromethane	ND	12000	50.0	
2-Chlorotoluene	ND	2500	50.0	
4-Chlorotoluene	ND	2500	50.0	
Dibromochloromethane	ND	2500	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	50.0	
1,2-Dibromoethane	ND	2500	50.0	
Dibromomethane	ND	2500	50.0	
1,2-Dichlorobenzene	ND	2500	50.0	
1,3-Dichlorobenzene	ND	2500	50.0	
1,4-Dichlorobenzene	ND	2500	50.0	
Dichlorodifluoromethane	ND	2500	50.0	
1,1-Dichloroethane	ND	2500	50.0	
1,2-Dichloroethane	ND	2500	50.0	
1,1-Dichloroethene	ND	2500	50.0	
c-1,2-Dichloroethene	ND	2500	50.0	
t-1,2-Dichloroethene	ND	2500	50.0	
1,2-Dichloropropane	ND	2500	50.0	
1,3-Dichloropropane	ND	2500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 2 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2500	50.0	
1,1-Dichloropropene	ND	2500	50.0	
c-1,3-Dichloropropene	ND	2500	50.0	
t-1,3-Dichloropropene	ND	2500	50.0	
Ethylbenzene	ND	2500	50.0	
2-Hexanone	ND	25000	50.0	
Isopropylbenzene	ND	2500	50.0	
p-Isopropyltoluene	ND	2500	50.0	
Methylene Chloride	ND	25000	50.0	
4-Methyl-2-Pentanone	ND	25000	50.0	
Naphthalene	ND	25000	50.0	
n-Propylbenzene	ND	2500	50.0	
Styrene	ND	2500	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	50.0	
Tetrachloroethene	ND	2500	50.0	
Toluene	ND	2500	50.0	
1,2,3-Trichlorobenzene	ND	5000	50.0	
1,2,4-Trichlorobenzene	ND	2500	50.0	
1,1,1-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloroethane	ND	2500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	50.0	
Trichloroethene	ND	2500	50.0	
1,2,3-Trichloropropane	ND	2500	50.0	
1,2,4-Trimethylbenzene	ND	2500	50.0	
Trichlorofluoromethane	ND	25000	50.0	
1,3,5-Trimethylbenzene	ND	2500	50.0	
Vinyl Acetate	ND	25000	50.0	
Vinyl Chloride	ND	2500	50.0	
p/m-Xylene	ND	2500	50.0	
o-Xylene	ND	2500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	64000	50.0	
Benzene	ND	2600	50.0	
Bromobenzene	ND	2600	50.0	
Bromochloromethane	ND	2600	50.0	
Bromodichloromethane	ND	2600	50.0	
Bromoform	ND	2600	50.0	
Bromomethane	ND	13000	50.0	
2-Butanone	ND	26000	50.0	
n-Butylbenzene	ND	2600	50.0	
sec-Butylbenzene	ND	2600	50.0	
tert-Butylbenzene	ND	2600	50.0	
Carbon Disulfide	ND	26000	50.0	
Carbon Tetrachloride	ND	2600	50.0	
Chlorobenzene	ND	2600	50.0	
Chloroethane	ND	2600	50.0	
Chloroform	ND	2600	50.0	
Chloromethane	ND	13000	50.0	
2-Chlorotoluene	ND	2600	50.0	
4-Chlorotoluene	ND	2600	50.0	
Dibromochloromethane	ND	2600	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	50.0	
1,2-Dibromoethane	ND	2600	50.0	
Dibromomethane	ND	2600	50.0	
1,2-Dichlorobenzene	ND	2600	50.0	
1,3-Dichlorobenzene	ND	2600	50.0	
1,4-Dichlorobenzene	ND	2600	50.0	
Dichlorodifluoromethane	ND	2600	50.0	
1,1-Dichloroethane	ND	2600	50.0	
1,2-Dichloroethane	ND	2600	50.0	
1,1-Dichloroethene	ND	2600	50.0	
c-1,2-Dichloroethene	ND	2600	50.0	
t-1,2-Dichloroethene	ND	2600	50.0	
1,2-Dichloropropane	ND	2600	50.0	
1,3-Dichloropropane	ND	2600	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 4 of 6

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	2600	50.0	
1,1-Dichloropropene	ND	2600	50.0	
c-1,3-Dichloropropene	ND	2600	50.0	
t-1,3-Dichloropropene	ND	2600	50.0	
Ethylbenzene	ND	2600	50.0	
2-Hexanone	ND	26000	50.0	
Isopropylbenzene	ND	2600	50.0	
p-Isopropyltoluene	ND	2600	50.0	
Methylene Chloride	ND	26000	50.0	
4-Methyl-2-Pentanone	ND	26000	50.0	
Naphthalene	ND	26000	50.0	
n-Propylbenzene	ND	2600	50.0	
Styrene	ND	2600	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	50.0	
Tetrachloroethene	ND	2600	50.0	
Toluene	ND	2600	50.0	
1,2,3-Trichlorobenzene	ND	5100	50.0	
1,2,4-Trichlorobenzene	ND	2600	50.0	
1,1,1-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloroethane	ND	2600	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	50.0	
Trichloroethene	ND	2600	50.0	
1,2,3-Trichloropropane	ND	2600	50.0	
1,2,4-Trimethylbenzene	ND	2600	50.0	
Trichlorofluoromethane	ND	26000	50.0	
1,3,5-Trimethylbenzene	ND	2600	50.0	
Vinyl Acetate	ND	26000	50.0	
Vinyl Chloride	ND	2600	50.0	
p/m-Xylene	ND	2600	50.0	
o-Xylene	ND	2600	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	12000	50.0	
Benzene	ND	500	50.0	
Bromobenzene	ND	500	50.0	
Bromochloromethane	ND	500	50.0	
Bromodichloromethane	ND	500	50.0	
Bromoform	ND	500	50.0	
Bromomethane	ND	2500	50.0	
2-Butanone	ND	5000	50.0	
n-Butylbenzene	ND	500	50.0	
sec-Butylbenzene	ND	500	50.0	
tert-Butylbenzene	ND	500	50.0	
Carbon Disulfide	ND	5000	50.0	
Carbon Tetrachloride	ND	500	50.0	
Chlorobenzene	ND	500	50.0	
Chloroethane	ND	500	50.0	
Chloroform	ND	500	50.0	
Chloromethane	ND	2500	50.0	
2-Chlorotoluene	ND	500	50.0	
4-Chlorotoluene	ND	500	50.0	
Dibromochloromethane	ND	500	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	50.0	
1,2-Dibromoethane	ND	500	50.0	
Dibromomethane	ND	500	50.0	
1,2-Dichlorobenzene	ND	500	50.0	
1,3-Dichlorobenzene	ND	500	50.0	
1,4-Dichlorobenzene	ND	500	50.0	
Dichlorodifluoromethane	ND	500	50.0	
1,1-Dichloroethane	ND	500	50.0	
1,2-Dichloroethane	ND	500	50.0	
1,1-Dichloroethene	ND	500	50.0	
c-1,2-Dichloroethene	ND	500	50.0	
t-1,2-Dichloroethene	ND	500	50.0	
1,2-Dichloropropane	ND	500	50.0	
1,3-Dichloropropane	ND	500	50.0	
2,2-Dichloropropane	ND	500	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International	Date Received:	02/12/15
2840 Wilderness Place	Work Order:	15-02-0865
Boulder, CO 80301-5414	Preparation:	EPA 5030C
	Method:	EPA 8260B
	Units:	ug/kg
Project: POWERBASE / SP ANALYTICAL TESTING		Page 6 of 6

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	500	50.0	
c-1,3-Dichloropropene	ND	500	50.0	
t-1,3-Dichloropropene	ND	500	50.0	
Ethylbenzene	ND	500	50.0	
2-Hexanone	ND	5000	50.0	
Isopropylbenzene	ND	500	50.0	
p-Isopropyltoluene	ND	500	50.0	
Methylene Chloride	ND	5000	50.0	
4-Methyl-2-Pentanone	ND	5000	50.0	
Naphthalene	ND	5000	50.0	
n-Propylbenzene	ND	500	50.0	
Styrene	ND	500	50.0	
1,1,1,2-Tetrachloroethane	ND	500	50.0	
1,1,2,2-Tetrachloroethane	ND	500	50.0	
Tetrachloroethene	ND	500	50.0	
Toluene	ND	500	50.0	
1,2,3-Trichlorobenzene	ND	1000	50.0	
1,2,4-Trichlorobenzene	ND	500	50.0	
1,1,1-Trichloroethane	ND	500	50.0	
1,1,2-Trichloroethane	ND	500	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	50.0	
Trichloroethene	ND	500	50.0	
1,2,3-Trichloropropane	ND	500	50.0	
1,2,4-Trimethylbenzene	ND	500	50.0	
Trichlorofluoromethane	ND	5000	50.0	
1,3,5-Trimethylbenzene	ND	500	50.0	
Vinyl Acetate	ND	5000	50.0	
Vinyl Chloride	ND	500	50.0	
p/m-Xylene	ND	500	50.0	
o-Xylene	ND	500	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	
Dibromofluoromethane	109	78-126	
1,2-Dichloroethane-d4	116	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-A**	**02/09/15 18:00**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 19:13**	**150221L012**

Comment(s): - The analysis was performed on a SPLP extract of the sample.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	1.0	1.00	
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	80-120	
Dibromofluoromethane	107	78-126	
1,2-Dichloroethane-d4	110	75-135	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-001-16449**	**N/A**	**Aqueous**	**GC/MS V V**	**02/12/15**	**02/21/15 13:07**	**150221L012**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	20	1.00	
Benzene	ND	0.50	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	1.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	1.0	1.00	
Bromomethane	ND	10	1.00	
2-Butanone	ND	10	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	0.50	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	10	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	1.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	1.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	1.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 8260B
Units: ug/L

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.0	1.00	
c-1,3-Dichloropropene	ND	0.50	1.00	
t-1,3-Dichloropropene	ND	0.50	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	10	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	10	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	1.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	1.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	1.0	1.00	
1,2,4-Trichlorobenzene	ND	1.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
Trichloroethene	ND	1.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	5.0	1.00	
1,2,4-Trimethylbenzene	ND	1.0	1.00	
1,3,5-Trimethylbenzene	ND	1.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	0.50	1.00	
p/m-Xylene	ND	1.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	80-120	
Dibromofluoromethane	111	78-126	
1,2-Dichloroethane-d4	115	75-135	
Toluene-d8	101	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0982-1	**Sample**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:39**	**150217S04**
15-02-0982-1	**Matrix Spike**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:40**	**150217S04**
15-02-0982-1	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 20:41**	**150217S04**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	25.00	4.524	18	3.579	14	50-115	23	0-20	3,4
Arsenic	4.678	25.00	27.64	92	30.42	103	75-125	10	0-20	
Barium	70.67	25.00	100.2	118	96.51	103	75-125	4	0-20	
Beryllium	ND	25.00	24.42	98	27.29	109	75-125	11	0-20	
Cadmium	ND	25.00	24.04	96	26.41	106	75-125	9	0-20	
Chromium	10.95	25.00	33.98	92	36.36	102	75-125	7	0-20	
Cobalt	5.267	25.00	29.41	97	33.07	111	75-125	12	0-20	
Copper	139.3	25.00	149.5	4X	140.4	4X	75-125	4X	0-20	Q
Lead	7.992	25.00	28.22	81	31.44	94	75-125	11	0-20	
Molybdenum	0.3190	25.00	20.13	79	23.19	91	75-125	14	0-20	
Nickel	24.90	25.00	47.16	89	47.80	92	75-125	1	0-20	
Selenium	ND	25.00	22.37	89	25.36	101	75-125	13	0-20	
Silver	ND	12.50	13.30	106	14.26	114	75-125	7	0-20	
Thallium	ND	25.00	22.06	88	23.69	95	75-125	7	0-20	
Vanadium	31.84	25.00	52.08	81	55.79	96	75-125	7	0-20	
Zinc	29.33	25.00	51.15	87	58.80	118	75-125	14	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:43**	**150216SA3**
POWERBASE	**Matrix Spike**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:45**	**150216SA3**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**ICP 7300**	**02/12/15**	**02/16/15 22:46**	**150216SA3**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	0.5000	0.4326	87	0.4386	88	72-132	1	0-10	
Arsenic	ND	0.5000	0.4201	84	0.4081	82	80-140	3	0-11	
Barium	ND	0.5000	0.3749	75	0.3516	70	87-123	6	0-6	3
Beryllium	ND	0.5000	0.4362	87	0.4338	87	89-119	1	0-8	3
Cadmium	ND	0.5000	0.4515	90	0.4465	89	82-124	1	0-7	
Chromium	ND	0.5000	0.4517	90	0.4484	90	86-122	1	0-8	
Cobalt	ND	0.5000	0.4652	93	0.4639	93	83-125	0	0-7	
Copper	ND	0.5000	0.4635	93	0.4705	94	78-126	1	0-7	
Lead	ND	0.5000	0.4500	90	0.4489	90	84-120	0	0-7	
Molybdenum	ND	0.5000	0.4316	86	0.4296	86	78-126	0	0-7	
Nickel	ND	0.5000	0.4490	90	0.4451	89	84-120	1	0-7	
Selenium	ND	0.5000	0.4140	83	0.4202	84	79-127	1	0-9	
Silver	ND	0.2500	0.1773	71	0.1650	66	86-128	7	0-7	3
Thallium	ND	0.5000	0.4822	96	0.4791	96	79-121	1	0-8	
Vanadium	ND	0.5000	0.4477	90	0.4423	88	88-118	1	0-7	
Zinc	0.08159	0.5000	0.5544	95	0.5513	94	89-131	1	0-8	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 1312
Method: EPA 7470A

Project: POWERBASE / SP ANALYTICAL TESTING

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:57**	**150218S05**
POWERBASE	**Matrix Spike**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 18:59**	**150218S05**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**Mercury 04**	**02/12/15**	**02/18/15 19:06**	**150218S05**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.05000	0.04945	99	0.04934	99	71-134	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-0850-1	**Sample**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:25**	**150218S01**
15-02-0850-1	**Matrix Spike**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:27**	**150218S01**
15-02-0850-1	**Matrix Spike Duplicate**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:29**	**150218S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.8350	0.8959	107	0.8939	107	71-137	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1583-5	**Sample**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:28**	**150221S09**
15-02-1583-5	**Matrix Spike**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:51**	**150221S09**
15-02-1583-5	**Matrix Spike Duplicate**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 16:09**	**150221S09**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acenaphthene	ND	10.00	10.29	103	10.47	105	34-148	2	0-20	
Acenaphthylene	ND	10.00	10.36	104	10.49	105	53-120	1	0-20	
Butyl Benzyl Phthalate	ND	10.00	11.14	111	11.47	115	15-189	3	0-20	
4-Chloro-3-Methylphenol	ND	10.00	9.062	91	9.158	92	32-120	1	0-20	
2-Chlorophenol	ND	10.00	8.993	90	9.273	93	53-120	3	0-20	
1,4-Dichlorobenzene	ND	10.00	8.795	88	9.131	91	43-120	4	0-26	
Dimethyl Phthalate	ND	10.00	10.05	100	10.14	101	44-122	1	0-20	
2,4-Dinitrotoluene	ND	10.00	10.09	101	10.02	100	28-120	1	0-20	
Fluorene	ND	10.00	10.17	102	10.34	103	12-186	2	0-20	
N-Nitroso-di-n-propylamine	ND	10.00	9.282	93	9.446	94	38-140	2	0-20	
Naphthalene	ND	10.00	8.981	90	9.206	92	20-140	2	0-20	
4-Nitrophenol	ND	10.00	8.991	90	8.970	90	14-128	0	0-59	
Pentachlorophenol	ND	10.00	5.400	54	5.622	56	10-124	4	0-20	
Phenol	ND	10.00	8.890	89	9.024	90	22-124	1	0-20	
Pyrene	ND	10.00	10.26	103	10.53	105	31-169	3	0-20	
1,2,4-Trichlorobenzene	ND	10.00	9.384	94	9.526	95	56-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:24**	**150220S11**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 17:47**	**150220S11**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS TT**	**02/12/15**	**02/23/15 18:05**	**150220S11**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Phenol	ND	2000	717.3	36	722.0	36	20-120	1	0-42	
2-Chlorophenol	ND	2000	1560	78	1581	79	23-134	1	0-40	
1,4-Dichlorobenzene	ND	2000	1633	82	1675	84	20-124	3	0-28	
N-Nitroso-di-n-propylamine	ND	2000	1519	76	1574	79	0-230	4	0-38	
1,2,4-Trichlorobenzene	ND	2000	1632	82	1686	84	44-142	3	0-28	
Naphthalene	ND	2000	1626	81	1689	84	50-150	4	0-20	
4-Chloro-3-Methylphenol	ND	2000	1437	72	1480	74	22-147	3	0-20	
Dimethyl Phthalate	ND	2000	1770	88	1807	90	50-150	2	0-20	
Acenaphthylene	ND	2000	1771	89	1847	92	50-150	4	0-20	
Acenaphthene	ND	2000	1880	94	1952	98	47-145	4	0-31	
4-Nitrophenol	ND	2000	523.5	26	531.2	27	0-132	1	0-20	
2,4-Dinitrotoluene	ND	2000	1757	88	1775	89	39-139	1	0-38	
Fluorene	ND	2000	1878	94	1941	97	50-150	3	0-20	
Pentachlorophenol	ND	2000	1099	55	1154	58	14-176	5	0-20	
Pyrene	ND	2000	1657	83	1714	86	52-115	3	0-20	
Butyl Benzyl Phthalate	ND	2000	1759	88	1823	91	50-150	4	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
POWERBASE	**Sample**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 13:59**	**150221S006**
POWERBASE	**Matrix Spike**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 15:46**	**150221S006**
POWERBASE	**Matrix Spike Duplicate**	**Solid**	**GC/MS V V**	**02/12/15**	**02/21/15 16:09**	**150221S006**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.65	85	43.15	86	74-122	1	0-21	
Carbon Tetrachloride	ND	50.00	51.03	102	50.20	100	60-144	2	0-21	
Chlorobenzene	ND	50.00	48.13	96	46.93	94	73-120	3	0-22	
1,2-Dibromoethane	ND	50.00	52.50	105	50.48	101	80-122	4	0-20	
1,2-Dichlorobenzene	ND	50.00	52.23	104	51.62	103	70-120	1	0-26	
1,2-Dichloroethane	ND	50.00	47.81	96	48.75	98	64-142	2	0-20	
1,1-Dichloroethene	ND	50.00	39.80	80	40.66	81	52-136	2	0-21	
Ethylbenzene	ND	50.00	45.82	92	44.52	89	77-125	3	0-24	
Toluene	ND	50.00	44.98	90	44.96	90	72-126	0	0-23	
Trichloroethene	ND	50.00	44.07	88	43.50	87	74-128	1	0-22	
Vinyl Chloride	ND	50.00	40.43	81	41.17	82	67-133	2	0-20	
p/m-Xylene	ND	100.0	96.64	97	94.37	94	63-129	2	0-25	
o-Xylene	ND	50.00	50.69	101	49.90	100	62-128	2	0-24	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	52.90	106	50.57	101	68-134	5	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3050B
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
097-01-002-20403	**LCS**	**Solid**	**ICP 7300**	**02/17/15**	**02/18/15 19:25**	**150217L04**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	25.00	22.86	91	80-120	73-127	
Arsenic	25.00	21.93	88	80-120	73-127	
Barium	25.00	23.89	96	80-120	73-127	
Beryllium	25.00	21.53	86	80-120	73-127	
Cadmium	25.00	22.99	92	80-120	73-127	
Chromium	25.00	22.12	88	80-120	73-127	
Cobalt	25.00	22.80	91	80-120	73-127	
Copper	25.00	22.88	92	80-120	73-127	
Lead	25.00	22.47	90	80-120	73-127	
Molybdenum	25.00	22.24	89	80-120	73-127	
Nickel	25.00	22.50	90	80-120	73-127	
Selenium	25.00	22.01	88	80-120	73-127	
Silver	12.50	11.58	93	80-120	73-127	
Thallium	25.00	22.21	89	80-120	73-127	
Vanadium	25.00	22.16	89	80-120	73-127	
Zinc	25.00	23.08	92	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 6010B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 2 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-021-1471	**LCS**	**Aqueous**	**ICP 7300**	**02/12/15**	**02/16/15 20:29**	**150216LA3**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	0.5000	0.4863	97	80-120	73-127	
Arsenic	0.5000	0.4732	95	80-120	73-127	
Barium	0.5000	0.5051	101	80-120	73-127	
Beryllium	0.5000	0.4967	99	80-120	73-127	
Cadmium	0.5000	0.5092	102	80-120	73-127	
Chromium	0.5000	0.5161	103	80-120	73-127	
Cobalt	0.5000	0.5268	105	80-120	73-127	
Copper	0.5000	0.5024	100	80-120	73-127	
Lead	0.5000	0.5109	102	80-120	73-127	
Molybdenum	0.5000	0.4835	97	80-120	73-127	
Nickel	0.5000	0.5120	102	80-120	73-127	
Selenium	0.5000	0.4895	98	80-120	73-127	
Silver	0.2500	0.2379	95	80-120	73-127	
Thallium	0.5000	0.5401	108	80-120	73-127	
Vanadium	0.5000	0.5067	101	80-120	73-127	
Zinc	0.5000	0.5466	109	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 7470A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 3 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-04-005-921	**LCS**	**Aqueous**	**Mercury 04**	**02/12/15**	**02/18/15 18:54**	**150218L05**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.05000	0.04942	99	90-122	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: POWERBASE / SP ANALYTICAL TESTING			Page 4 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-272-989	**LCS**	**Solid**	**Mercury 05**	**02/18/15**	**02/18/15 13:22**	**150218L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.8828	106	85-121	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 3545
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 5 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-549-3208	**LCS**	**Solid**	**GC/MS CCC**	**02/21/15**	**02/23/15 15:26**	**150221L09**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acenaphthene	10.00	10.12	101	51-123	39-135	
Acenaphthylene	10.00	10.15	101	52-120	41-131	
Butyl Benzyl Phthalate	10.00	11.22	112	43-139	27-155	
4-Chloro-3-Methylphenol	10.00	9.037	90	55-121	44-132	
2-Chlorophenol	10.00	8.783	88	58-124	47-135	
1,4-Dichlorobenzene	10.00	8.120	81	42-132	27-147	
Dimethyl Phthalate	10.00	10.25	102	51-123	39-135	
2,4-Dinitrotoluene	10.00	10.09	101	51-129	38-142	
Fluorene	10.00	10.11	101	54-126	42-138	
N-Nitroso-di-n-propylamine	10.00	9.134	91	40-136	24-152	
Naphthalene	10.00	8.746	87	32-146	13-165	
4-Nitrophenol	10.00	8.721	87	24-126	7-143	
Pentachlorophenol	10.00	4.209	42	23-131	5-149	
Phenol	10.00	8.686	87	40-130	25-145	
Pyrene	10.00	10.34	103	47-143	31-159	
1,2,4-Trichlorobenzene	10.00	8.865	89	45-129	31-143	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 1312
		Method:	EPA 8270C
Project: POWERBASE / SP ANALYTICAL TESTING			Page 6 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-025-182	**LCS**	**Aqueous**	**GC/MS TT**	**02/20/15**	**02/23/15 17:26**	**150220L11**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Phenol	2000	727.0	36	20-120	3-137	
2-Chlorophenol	2000	1553	78	23-134	4-152	
1,4-Dichlorobenzene	2000	1592	80	20-124	3-141	
N-Nitroso-di-n-propylamine	2000	1529	76	0-230	0-268	
1,2,4-Trichlorobenzene	2000	1618	81	44-142	28-158	
Naphthalene	2000	1644	82	21-133	2-152	
4-Chloro-3-Methylphenol	2000	1435	72	22-147	1-168	
Dimethyl Phthalate	2000	1781	89	0-112	0-131	
Acenaphthylene	2000	1840	92	33-145	14-164	
Acenaphthene	2000	1889	94	47-145	31-161	
4-Nitrophenol	2000	522.1	26	0-132	0-154	
2,4-Dinitrotoluene	2000	1742	87	39-139	22-156	
Fluorene	2000	1883	94	59-121	49-131	
Pentachlorophenol	2000	1081	54	14-176	0-203	
Pyrene	2000	1665	83	52-115	42-126	
Butyl Benzyl Phthalate	2000	1780	89	0-152	0-177	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 7 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 8 of 8

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-001-16449	**LCS**	**Aqueous**	**GC/MS V V**	**02/21/15**	**02/21/15 11:22**	**150221L012**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	43.32	87	80-120	73-127	
Carbon Tetrachloride	50.00	53.00	106	67-139	55-151	
Chlorobenzene	50.00	48.84	98	78-120	71-127	
1,2-Dibromoethane	50.00	53.03	106	80-120	73-127	
1,2-Dichlorobenzene	50.00	51.55	103	63-129	52-140	
1,2-Dichloroethane	50.00	47.89	96	70-130	60-140	
1,1-Dichloroethene	50.00	39.68	79	66-126	56-136	
Ethylbenzene	50.00	46.09	92	80-123	73-130	
Toluene	50.00	45.70	91	80-120	73-127	
Trichloroethene	50.00	44.07	88	80-122	73-129	
Vinyl Chloride	50.00	41.58	83	70-130	60-140	
p/m-Xylene	100.0	95.99	96	75-123	67-131	
o-Xylene	50.00	50.79	102	74-122	66-130	
Methyl-t-Butyl Ether (MTBE)	50.00	55.35	111	69-129	59-139	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6010B	EPA 3050B	935	ICP 7300	1
EPA 6010B	EPA 1312	935	ICP 7300	1
EPA 7470A	EPA 1312	915	Mercury 04	1
EPA 7471A	EPA 7471A Total	915	Mercury 05	1
EPA 8260B	EPA 1312	905	GC/MS V V	2
EPA 8260B	EPA 1312	927	GC/MS V V	2
EPA 8260B	EPA 5030C	905	GC/MS Q	2
EPA 8270C	EPA 3545	923	GC/MS CCC	1
EPA 8270C	EPA 1312	923	GC/MS TT	1

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
	ECI	2/12/15	1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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Supplemental Report 1

The original report has been revised/corrected.

WORK ORDER NUMBER: 15-02-0865

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Brock International

Client Project Name: POWERBASE / SP ANALYTICAL TESTING

Attention: Richard Runkles
2840 Wilderness Place
Boulder, CO 80301-5414

Approved for release on 04/09/2015 by:
Don Burley
Project Manager

ResultLink

Email your PM

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Client Project Name: POWERBASE / SP ANALYTICAL TESTING
Work Order Number: 15-02-0865

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Work Order Narrative

Work Order: 15-02-0865 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 02/12/15. They were assigned to Work Order 15-02-0865.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

EPA 8260B VOCs results are reported to the MDLs (Method Detection Limits).

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Sample Summary

Client:	Brock International 2840 Wilderness Place Boulder, CO 80301-5414	Work Order:	15-02-0865
		Project Name:	POWERBASE / SP ANALYTICAL TESTING
		PO Number:	
		Date/Time Received:	02/12/15 11:00
		Number of Containers:	4
Attn:	Richard Runkles		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
POWERBASE	15-02-0865-1	02/09/15 18:00	3	Solid
SP	15-02-0865-2	02/09/15 18:00	1	Solid

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
POWERBASE	**15-02-0865-1-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 20:42**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	62000	3100	50.0	
Benzene	ND	2500	65	50.0	
Bromobenzene	ND	2500	100	50.0	
Bromochloromethane	ND	2500	350	50.0	
Bromodichloromethane	ND	2500	120	50.0	
Bromoform	ND	2500	400	50.0	
Bromomethane	ND	12000	4700	50.0	
2-Butanone	ND	25000	1900	50.0	
n-Butylbenzene	ND	2500	78	50.0	
sec-Butylbenzene	ND	2500	290	50.0	
tert-Butylbenzene	ND	2500	75	50.0	
Carbon Disulfide	ND	25000	150	50.0	
Carbon Tetrachloride	ND	2500	140	50.0	
Chlorobenzene	ND	2500	110	50.0	
Chloroethane	ND	2500	750	50.0	
Chloroform	ND	2500	120	50.0	
Chloromethane	240	12000	150	50.0	B,J
2-Chlorotoluene	ND	2500	120	50.0	
4-Chlorotoluene	ND	2500	110	50.0	
Dibromochloromethane	ND	2500	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5000	870	50.0	
1,2-Dibromoethane	ND	2500	130	50.0	
Dibromomethane	ND	2500	390	50.0	
1,2-Dichlorobenzene	ND	2500	110	50.0	
1,3-Dichlorobenzene	ND	2500	88	50.0	
1,4-Dichlorobenzene	ND	2500	110	50.0	
Dichlorodifluoromethane	ND	2500	220	50.0	
1,1-Dichloroethane	ND	2500	110	50.0	
1,2-Dichloroethane	ND	2500	160	50.0	
1,1-Dichloroethene	ND	2500	170	50.0	
c-1,2-Dichloroethene	ND	2500	140	50.0	
t-1,2-Dichloroethene	ND	2500	250	50.0	
1,2-Dichloropropane	ND	2500	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2500	130	50.0	
2,2-Dichloropropane	ND	2500	170	50.0	
1,1-Dichloropropene	ND	2500	160	50.0	
c-1,3-Dichloropropene	ND	2500	130	50.0	
t-1,3-Dichloropropene	ND	2500	300	50.0	
Ethylbenzene	ND	2500	76	50.0	
2-Hexanone	ND	25000	880	50.0	
Isopropylbenzene	ND	2500	270	50.0	
p-Isopropyltoluene	ND	2500	310	50.0	
Methylene Chloride	ND	25000	670	50.0	
4-Methyl-2-Pentanone	ND	25000	2200	50.0	
Naphthalene	ND	25000	410	50.0	
n-Propylbenzene	ND	2500	250	50.0	
Styrene	ND	2500	300	50.0	
1,1,1,2-Tetrachloroethane	ND	2500	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2500	170	50.0	
Tetrachloroethene	ND	2500	100	50.0	
Toluene	ND	2500	260	50.0	
1,2,3-Trichlorobenzene	ND	5000	460	50.0	
1,2,4-Trichlorobenzene	ND	2500	160	50.0	
1,1,1-Trichloroethane	ND	2500	110	50.0	
1,1,2-Trichloroethane	ND	2500	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	25000	180	50.0	
Trichloroethene	ND	2500	150	50.0	
1,2,3-Trichloropropane	ND	2500	420	50.0	
1,2,4-Trimethylbenzene	ND	2500	290	50.0	
Trichlorofluoromethane	ND	25000	190	50.0	
1,3,5-Trimethylbenzene	ND	2500	270	50.0	
Vinyl Acetate	ND	25000	2400	50.0	
Vinyl Chloride	ND	2500	250	50.0	
p/m-Xylene	ND	2500	130	50.0	
o-Xylene	ND	2500	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2500	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	60-132	
Dibromofluoromethane	86	63-141	
1,2-Dichloroethane-d4	102	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SP	**15-02-0865-2-B**	**02/09/15 18:00**	**Solid**	**GC/MS Q**	**02/12/15**	**02/17/15 21:09**	**150217L009**

Comment(s): - The reporting limit is elevated resulting from matrix interference.
- Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	64000	3200	50.0	
Benzene	ND	2600	66	50.0	
Bromobenzene	ND	2600	110	50.0	
Bromochloromethane	ND	2600	350	50.0	
Bromodichloromethane	ND	2600	120	50.0	
Bromoform	ND	2600	410	50.0	
Bromomethane	ND	13000	4800	50.0	
2-Butanone	ND	26000	1900	50.0	
n-Butylbenzene	ND	2600	80	50.0	
sec-Butylbenzene	ND	2600	290	50.0	
tert-Butylbenzene	ND	2600	77	50.0	
Carbon Disulfide	ND	26000	160	50.0	
Carbon Tetrachloride	ND	2600	140	50.0	
Chlorobenzene	ND	2600	110	50.0	
Chloroethane	ND	2600	760	50.0	
Chloroform	ND	2600	120	50.0	
Chloromethane	200	13000	160	50.0	B,J
2-Chlorotoluene	ND	2600	120	50.0	
4-Chlorotoluene	ND	2600	110	50.0	
Dibromochloromethane	ND	2600	290	50.0	
1,2-Dibromo-3-Chloropropane	ND	5100	890	50.0	
1,2-Dibromoethane	ND	2600	130	50.0	
Dibromomethane	ND	2600	400	50.0	
1,2-Dichlorobenzene	ND	2600	120	50.0	
1,3-Dichlorobenzene	ND	2600	90	50.0	
1,4-Dichlorobenzene	ND	2600	110	50.0	
Dichlorodifluoromethane	ND	2600	230	50.0	
1,1-Dichloroethane	ND	2600	110	50.0	
1,2-Dichloroethane	ND	2600	160	50.0	
1,1-Dichloroethene	ND	2600	180	50.0	
c-1,2-Dichloroethene	ND	2600	140	50.0	
t-1,2-Dichloroethene	ND	2600	260	50.0	
1,2-Dichloropropane	ND	2600	220	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
1,3-Dichloropropane	ND	2600	130	50.0	
2,2-Dichloropropane	ND	2600	170	50.0	
1,1-Dichloropropene	ND	2600	170	50.0	
c-1,3-Dichloropropene	ND	2600	130	50.0	
t-1,3-Dichloropropene	ND	2600	310	50.0	
Ethylbenzene	ND	2600	77	50.0	
2-Hexanone	ND	26000	900	50.0	
Isopropylbenzene	ND	2600	280	50.0	
p-Isopropyltoluene	ND	2600	320	50.0	
Methylene Chloride	ND	26000	680	50.0	
4-Methyl-2-Pentanone	ND	26000	2200	50.0	
Naphthalene	ND	26000	420	50.0	
n-Propylbenzene	ND	2600	260	50.0	
Styrene	ND	2600	310	50.0	
1,1,1,2-Tetrachloroethane	ND	2600	120	50.0	
1,1,2,2-Tetrachloroethane	ND	2600	180	50.0	
Tetrachloroethene	ND	2600	110	50.0	
Toluene	ND	2600	260	50.0	
1,2,3-Trichlorobenzene	ND	5100	470	50.0	
1,2,4-Trichlorobenzene	ND	2600	160	50.0	
1,1,1-Trichloroethane	ND	2600	110	50.0	
1,1,2-Trichloroethane	ND	2600	180	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	26000	180	50.0	
Trichloroethene	ND	2600	150	50.0	
1,2,3-Trichloropropane	ND	2600	420	50.0	
1,2,4-Trimethylbenzene	ND	2600	300	50.0	
Trichlorofluoromethane	ND	26000	190	50.0	
1,3,5-Trimethylbenzene	ND	2600	280	50.0	
Vinyl Acetate	ND	26000	2400	50.0	
Vinyl Chloride	ND	2600	260	50.0	
p/m-Xylene	ND	2600	140	50.0	
o-Xylene	ND	2600	280	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	2600	150	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	60-132	
Dibromofluoromethane	83	63-141	
1,2-Dichloroethane-d4	99	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-796-9401**	**N/A**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:30**	**150217L009**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Acetone	ND	12000	620	50.0	
Benzene	ND	500	13	50.0	
Bromobenzene	ND	500	21	50.0	
Bromochloromethane	ND	500	69	50.0	
Bromodichloromethane	ND	500	23	50.0	
Bromoform	ND	500	79	50.0	
Bromomethane	ND	2500	940	50.0	
2-Butanone	ND	5000	380	50.0	
n-Butylbenzene	ND	500	16	50.0	
sec-Butylbenzene	ND	500	58	50.0	
tert-Butylbenzene	ND	500	15	50.0	
Carbon Disulfide	ND	5000	31	50.0	
Carbon Tetrachloride	ND	500	28	50.0	
Chlorobenzene	ND	500	22	50.0	
Chloroethane	ND	500	150	50.0	
Chloroform	ND	500	24	50.0	
Chloromethane	36	2500	30	50.0	J
2-Chlorotoluene	ND	500	23	50.0	
4-Chlorotoluene	ND	500	21	50.0	
Dibromochloromethane	ND	500	57	50.0	
1,2-Dibromo-3-Chloropropane	ND	1000	170	50.0	
1,2-Dibromoethane	ND	500	26	50.0	
Dibromomethane	ND	500	77	50.0	
1,2-Dichlorobenzene	ND	500	23	50.0	
1,3-Dichlorobenzene	ND	500	18	50.0	
1,4-Dichlorobenzene	ND	500	22	50.0	
Dichlorodifluoromethane	ND	500	44	50.0	
1,1-Dichloroethane	ND	500	21	50.0	
1,2-Dichloroethane	ND	500	31	50.0	
1,1-Dichloroethene	ND	500	35	50.0	
c-1,2-Dichloroethene	ND	500	28	50.0	
t-1,2-Dichloroethene	ND	500	51	50.0	
1,2-Dichloropropane	ND	500	44	50.0	
1,3-Dichloropropane	ND	500	25	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Brock International
2840 Wilderness Place
Boulder, CO 80301-5414

Date Received: 02/12/15
Work Order: 15-02-0865
Preparation: EPA 5030C
Method: EPA 8260B
Units: ug/kg

Project: POWERBASE / SP ANALYTICAL TESTING

Parameter	Result	RL	MDL	DF	Qualifiers
2,2-Dichloropropane	ND	500	33	50.0	
1,1-Dichloropropene	ND	500	33	50.0	
c-1,3-Dichloropropene	ND	500	25	50.0	
t-1,3-Dichloropropene	ND	500	61	50.0	
Ethylbenzene	ND	500	15	50.0	
2-Hexanone	ND	5000	180	50.0	
Isopropylbenzene	ND	500	55	50.0	
p-Isopropyltoluene	ND	500	63	50.0	
Methylene Chloride	ND	5000	130	50.0	
4-Methyl-2-Pentanone	ND	5000	430	50.0	
Naphthalene	ND	5000	81	50.0	
n-Propylbenzene	ND	500	50	50.0	
Styrene	ND	500	60	50.0	
1,1,1,2-Tetrachloroethane	ND	500	24	50.0	
1,1,2,2-Tetrachloroethane	ND	500	35	50.0	
Tetrachloroethene	ND	500	21	50.0	
Toluene	ND	500	52	50.0	
1,2,3-Trichlorobenzene	ND	1000	91	50.0	
1,2,4-Trichlorobenzene	ND	500	31	50.0	
1,1,1-Trichloroethane	ND	500	23	50.0	
1,1,2-Trichloroethane	ND	500	35	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5000	35	50.0	
Trichloroethene	ND	500	30	50.0	
1,2,3-Trichloropropane	ND	500	83	50.0	
1,2,4-Trimethylbenzene	ND	500	59	50.0	
Trichlorofluoromethane	ND	5000	38	50.0	
1,3,5-Trimethylbenzene	ND	500	55	50.0	
Vinyl Acetate	ND	5000	470	50.0	
Vinyl Chloride	ND	500	50	50.0	
p/m-Xylene	ND	500	27	50.0	
o-Xylene	ND	500	56	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	500	30	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	93	60-132	
Dibromofluoromethane	90	63-141	
1,2-Dichloroethane-d4	101	62-146	
Toluene-d8	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
15-02-1169-1	**Sample**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 14:56**	**150217S007**
15-02-1169-1	**Matrix Spike**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:16**	**150217S007**
15-02-1169-1	**Matrix Spike Duplicate**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 16:42**	**150217S007**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	50.00	42.12	84	42.61	85	61-127	1	0-20	
Carbon Tetrachloride	ND	50.00	47.79	96	50.50	101	51-135	6	0-29	
Chlorobenzene	ND	50.00	45.85	92	44.20	88	57-123	4	0-20	
1,2-Dibromoethane	ND	50.00	47.29	95	46.21	92	64-124	2	0-20	
1,2-Dichlorobenzene	ND	50.00	45.92	92	41.43	83	35-131	10	0-25	
1,2-Dichloroethane	ND	50.00	45.50	91	45.19	90	80-120	1	0-20	
1,1-Dichloroethene	ND	50.00	43.23	86	45.39	91	47-143	5	0-25	
Ethylbenzene	ND	50.00	44.51	89	43.19	86	57-129	3	0-22	
Toluene	ND	50.00	42.66	85	42.83	86	63-123	0	0-20	
Trichloroethene	ND	50.00	43.10	86	44.49	89	44-158	3	0-20	
Vinyl Chloride	ND	50.00	41.47	83	42.80	86	49-139	3	0-47	
p/m-Xylene	ND	100.0	94.52	95	90.19	90	70-130	5	0-30	
o-Xylene	ND	50.00	47.51	95	46.22	92	70-130	3	0-30	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	43.77	88	43.65	87	57-123	0	0-21	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Brock International		Date Received:	02/12/15
2840 Wilderness Place		Work Order:	15-02-0865
Boulder, CO 80301-5414		Preparation:	EPA 5030C
		Method:	EPA 8260B
Project: POWERBASE / SP ANALYTICAL TESTING			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-796-9401	**LCS**	**Solid**	**GC/MS Q**	**02/17/15**	**02/17/15 13:06**	**150217L009**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Benzene	50.00	46.43	93	78-120	71-127	
Carbon Tetrachloride	50.00	55.13	110	49-139	34-154	
Chlorobenzene	50.00	51.10	102	79-120	72-127	
1,2-Dibromoethane	50.00	49.32	99	80-120	73-127	
1,2-Dichlorobenzene	50.00	50.97	102	75-120	68-128	
1,2-Dichloroethane	50.00	48.00	96	80-120	73-127	
1,1-Dichloroethene	50.00	47.90	96	74-122	66-130	
Ethylbenzene	50.00	50.03	100	76-120	69-127	
Toluene	50.00	47.61	95	77-120	70-127	
Trichloroethene	50.00	47.04	94	80-120	73-127	
Vinyl Chloride	50.00	43.91	88	68-122	59-131	
p/m-Xylene	100.0	105.8	106	75-125	67-133	
o-Xylene	50.00	53.32	107	75-125	67-133	
Methyl-t-Butyl Ether (MTBE)	50.00	45.01	90	77-120	70-127	

Total number of LCS compounds: 14
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 15-02-0865 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 8260B	EPA 5030C	905	GC/MS Q	2

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Glossary of Terms and Qualifiers

Work Order: 15-02-0865 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

CHAIN-OF-CUSTODY RECORD

DATE: 2/12/15
PAGE: 1 OF 1

WO NO. / LAB USE ONLY
15-02-0865

LABORATORY CLIENT: BROCK INTERNATIONAL
ADDRESS: 2840 WILDERNESS PLACE, SUITE C
CITY: BOULDER STATE: CO ZIP: 8031
TEL: 303 544 5800 E-MAIL: KKOPERA@BROCK-INTERNATIONAL.COM

CLIENT PROJECT NAME / NO.: POWERBASE/SP ANALYTICAL TESTING
P.O. NO.:
PROJECT CONTACT: RICHARD RUNKLES
LAB CONTACT OR QUOTE NO.: 959457
GLOBAL ID:
LOG CODE:
SAMPLER(S): (PRINT) STEVE SAWYER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

EDD:
☐ COELT EDF ☐ OTHER

SPECIAL INSTRUCTIONS:
POWEBASE = WHITE
SP = BLACK/WHITE

REQUESTED ANALYSES
Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	See attached quote			
1	POWERBASE	2/9/15	1800	S	3																		X			
2	SP	↓	↓	↓	1																		X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation) ECI	Date: 2/12/15	Time: 1100
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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MATERIAL SAFETY DATA SHEET

ENVIROFILL Last Updated May 7, 2011

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Envirofill**

Product Use: Infill for synthetic / artificial turf

Company Identification: **USGreentech, LLC**
3607 Church Street
Cincinnati, OH 45244
(800) 548-0402 For Product Information
(800) 548-0402 For Emergencies

2. COMPOSITION / INFORMATION ON INGREDIENTS

CONTAINING: HAZARDOUS AND/OR REGULATED COMPONENTS

Chemical Name	Amount	CAS Number	OSHA PEL (TWA)	ACGIH TWA
Silicon Dioxide	>98%	14808-60-7	100 ppm	50 ppm
Acrylic Polymers	<2%	Proprietary	Not Listed	Not Listed
Calcium Carbonate	<0.2%	471-34-1	5 mg/m³	3 mg/m³
Microban	<0.2%	Proprietary	Not Listed	Not Listed

COMPOSITION NOTE: This product consists of silicon dioxide coated with an acrylic polymer. Although Envirofill® is composed primarily of Silica Sand (SIO2), and such sand is potentially a source of respirable dust, the sand particles in Envirofill ® are thoroughly encapsulated in a coating which captures all dust and ingredients. Under normal circumstances, this prevents any normal release of silica dust to the workplace. An independent study was conducted by Duke University School of Medicine on this product and determined that this product does not contain hazardous substances when evaluated under ASTM F963.8.2. Further this product should be classified as NOT being toxic, corrosive, skin/eye irritants, or a strong sensitizer as defined in 16 CFR 1500.3(b)(5), and 1500.3(b)(7) – (9) of the Federal Hazardous Substances Act.

HAZARDS DISCLOSURE: This product does not contain known hazardous materials in reportable levels as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200 except as listed above. As defined under Sara 311 and 312, this product does not contain known hazardous materials.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product may cause mechanical irritation to eyes and/or skin.

POTENTIAL HEALTH EFFECTS
ROUTES OF ENTRY: Eyes, Inhalation, Ingestion.
INHALATION: Not expected to be an inhalation hazard when used as intended.
INGESTION: Ingestion of this product may cause gastrointestinal irritation.
SKIN CONTACT: Contact with skin may cause mechanical irritation.
EYE CONTACT: Contact with eyes will cause mechanical irritation.
CHRONIC EXPOSURE: None known

4. FIRST AID MEASURES

INHALATION FIRST AID: This product is not expected to generate dust under normal conditions. If an individual has breathing difficulties remove individual to fresh air. If individual stops breathing, use artificial respiration to support vital functions. Seek medical attention immediately.
SKIN CONTACT FIRST AID This product may produce a mechanical irritation. It is not expected to require medical attention.
EYE CONTACT FIRST AID: If contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes lifting upper and lower eyelids occasionally. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
INGESTION FIRST AID: Routine use of this product is not expected to cause any situation which could lead to ingestion.
NOTE TO PHYSICIANS: Treat symptoms

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: Non-Flammable
AUTO IGNITION TEMPERATURE: Not Applicable
FLASH POINT: NA.
FLAMMABLE LIMITS IN AIR, % by Volume: lel: NA; uel: NA
EXTINGUISHING MEDIA: Use fire extinguishing materials appropriate for surrounding fire.
FIRE & EXPLOSION HAZARDS: None

6. ACCIDENTAL RELEASE MEASURES

SPILL CLEAN-UP PROCEDURES: Vacuum or sweep up material and place all spilled residue in a suitable container. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations.

7. HANDLING AND STORAGE

STORAGE CONDITIONS: Store containers in a cool, dry location, and away from direct sunlight.

HANDLING: Avoid breakage of bagged material or spills of bulk material. Material does not have a shelf life. Stack bagged material so that it does not have the opportunity to fall. This material is not hazardous under normal storage conditions.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS: See Section 2 for component airborne exposure levels..
VENTILATION SYSTEM: Not required when using this product.
PERSONAL RESPIRATORS (NIOSH APPROVED): Not required when using this product.
RESPIRATORY PROTECTION: Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

SKIN PROTECTION: Not required in normal applications.
EYE PROTECTION: Use safety glasses to prevent contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Solid
ODOR: Odorless
SOLUBILITY IN WATER: Negligible
MELTING POINT: 1710ºC
AUTO IGNITION TEMPERATURE: NA
pH: NA
COLOR: Various
BOILING POINT: 2230ºC
SPECIFIC GRAVITY: 2.9 – 3.1
EVAPORATION RATE (BuAc=1): NA
FLASH POINT: NA
BULK DENSITY: ~110 lbs/ft³

10. STABILITY AND REACTIVITY

STABILITY: Stable under ordinary conditions of use and storage.
CONDITIONS TO AVOID: Extreme temperatures above 870ºC
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBILITY WITH OTHER MATERIALS: None
HAZARDOUS DECOMPOSITION: None

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:
There is no Data available for this finished product.
SUSPECTED CANCER AGENT: A component of this product is found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, or CAL/OSHA but because the product is encapsulated in a polymer coating and having a larger particle size it should therefore not be considered to be, or suspected to be a carcinogenic agent by these agencies.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
No Data
ENVIRONMENTAL TOXICITY:
There is no data that suggests that this product is toxic to birds, fish, invertebrates, microorganisms or plants.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:
Recover, reclaim or recycle when practical.
Dispose of material in accordance with federal, state and local requirements.

14. TRANSPORTATION INFORMATION

DOMESTIC (LAND, D.O.T.), INTERNATIONAL (WATER, I.M.O.), INTERNATIONAL (AIR, I.C.A.O.)
NON-REGULATED MATERIAL

15. REGULATORY INFORMATION

FEDERAL REGULATORY STATUS:
U.S. SARA REPORTING REQUIREMENTS: The components of this product are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, and are listed as follows:
U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.
U.S. CERCLA REPORTABLE QUANTITY (RQ): None
U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

16. OTHER INFORMATION

Prepared By: Paul Eigbrett (MSDS Authoring PLUS)
ADDITIONAL INFORMATION:

The data in this Material Safety Data Sheet relates only to the specific material designated herein. It does not relate to use in combination with any other material or in any process. This Material Safety Data Sheet (MSDS) has been reviewed to fully comply with the guidance contained in the ANSI MSDS standard (ANSI Z400.1-2004)

Although the information set forth herein is presented in good faith and believed to be correct as of the date of issuance, it has been furnished by our suppliers; consequently, USGreentech, LLC makes no representations or warranties, express or implied, with respect to information herein presented. The information set forth herein is supplied upon the condition that the persons receiving same will make their own determination as to suitability for their purposes prior to use and relates only to the specific product described and not to such product in combination with any other product. In no event will USGreentech, LLC be responsible for damages of any nature resulting from the use of or reliance upon this information.

END OF MSDS

Source: US Greentech Manufacturing website

ENVIROFILL

What is Envirofill?

Envirofill is an acrylic-coated round sand infused with Microban® antimicrobial technology for protection against bacteria, mold and mildew that can cause stains and odors. Envirofill has both sports and landscape applications, used in soccer, football and baseball fields, putting greens, backyards, playgrounds and more.

With many benefits such as superior durability, multiple lifecycle uses (reusable) and non-compaction, Envirofill is a safer, more sustainable synthetic turf infill option that boasts maximum playability and performance. It's also an extremely low maintenance product, with no need for irrigation and limited need for top off.

What are the benefits?

For sports applications, Envirofill provides maximum performance and safety for athletes. Tests have shown up to 85% less flyout than the standard crumb rubber infill as well as synthetic turf surface temperatures of up to 25% reduction. There is no need for irrigation and there is minimal to no migration of the product even on high-traffic fields and in varying weather conditions. Envirofill is also environmentally-friendly. There is no leaching of the coating and it can be reused for two field lifecycles.

On the landscape side, customers love that the Microban antimicrobial technology is highly effective against bacteria, mold and mildew. Ammonia odor from dog and pet urine is reduced by up to 99%. Many of the aforementioned benefits of heat reduction, low maintenance and a long lifespan are also greatly enjoyed by homeowners and businesses around the country.

How durable is the coating?

The coating on Envirofill is extremely durable. It was designed to withstand the harshest elements. We are so confident in the coating that we have provided a 16-year warranty on the product's color and coating – the longest warranty of an artificial turf infill.

Envirofill has been in production since 2005 and has proven to have a very stable coating. The simplest test to prove its stability is to place the product in a jar of water and shake it. The water will stay clear. We put Envirofill through a number of accelerated wear tests which expose the product to UV rays through warm, cold, and wet cycles over 3,000 hours. The coating has proven to withstand these extreme temperature changes.

How does an Envirofill field compare to a standard sand/rubber field?

An Envirofill field will be more firm than a sand and rubber field. The shock absorption with an Envirofill field is provided by a shock pad. The shock pad provides a firmness to support athlete's motion, foot stability, and ball-to-surface interaction. By providing shock attenuation via the shock pad, it will still keep athletes safe during play on the field.

Envirofill fields are very consistent over their lives, due to two reasons: The infill is homogenous so there is no mixing over time and Envirofill settles into the turf very quickly at installation so there is no "break-in" period. Sand/rubber fields tend to change in performance over their life – they are typically soft at initial installation and then firm up toward the end of their life. Systems with Envirofill have been shown to have less than 10% change in Gmax scores.

Can Envirofill be reused for the second sports field lifecycle?

Envirofill has been proven to have a long life, with extreme durability against the harsh elements of a sports field. With a 16-year warranty on the coating and color, Envirofill can be reused after the first lifecycle and will continue to perform at an optimum level. A great example of the strength of Envirofill is Tatum High School, in Tatum, Texas. The football field at Tatum was one of the earliest Envirofill fields to be installed in 2005. The owner and the team appreciated the performance level of Envirofill so much, that when the field was up for replacement in 2013, they elected to reclaim the infill and reinstall it into the new surface.

Can Envirofill help cool the surface temperature of a synthetic turf system?

Simply put, yes. In a sports system, Envirofill is typically within ½" – ¾" of the tips of the fibers. In these systems, Envirofill aids in reflecting the sun's energy. Envirofill '12/20 Tan' has been proven to lower temperatures as much as 37 degrees when compared to a system with the same turf and rubber infill.

How much does Envirofill cost?

Envirofill is currently sold into two markets: landscape and sports. We sell to distributors who resell the 50lb bags into their respective markets. This helps reduce freight costs by shipping full truckloads to key areas of the country where the product is then sold by

the pallet and by the bag. Each distributor sets their own pricing. We can put you in touch with the distributor that is closest to you or your project.

LABORATORY TESTING
HEAVY METALS ANALYSIS

Project Information

Project Name	Envirofill Infill Heavy Metals Analysis	
Client Information	US Greentech 3607 Church Street Cincinnati, OH 45244	
Date	April 12, 2016	
Job no.	90796/882	
Report Status	Final	
Prepared by	*Jeffrey Gentile* *Laboratory Director*	
Checked by	*Kieran O'Donnell* *Field Operation Manager*	

Notes:

1. This report has been prepared by Sports Labs USA with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it.

2. This report is confidential to the Client and Sports Labs USA accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

3. This report shall not be used for engineering or contractual purposes unless signed by the Author and the Checker and unless the report status is "Final."

Standard / Regulation:

The STC suggests that any toxicological test and analysis of infill for synthetic turf fields be performed according to European Standard EN 71-3 – Safety of Toys Part 3: Migration of certain elements. The analytical method for each metal can be found in the results table below.

Requirements:

The target detection limits for each metal can be found in the results table below. The limits shown are per European Standard EN 71-3 – Safety of Toys Part 3: Migration of certain elements.

Results:

All results were found to be below the limit criteria referenced above.

SPORTS LABS USA
Unit #2 ● 155 River Road ● Bow ● New Hampshire ● 03304
Telephone: (603) 715 5453 ● E-Mail: Info@sportslabsusa.com

LABORATORY TESTING
HEAVY METALS ANALYSIS

Results Table:

Analyte	Analytical Method	*Target Detection Limit (mg/kg)	Sample Detection Limit (SDL) Based Result	PASS / FAIL
Aluminum	NF EN ISO 11885	*70,000*	< 50 mg/kg	PASS
Antimony	NF EN ISO 11885	*560*	< 10 mg/kg	PASS
Arsenic	NF EN ISO 11885	*47*	< 5 mg/kg	PASS
Barium	NF EN ISO 11885	*18,750*	< 50 mg/kg	PASS
Boron	NF EN ISO 17294-1 et 2	*15,000*	< 50 mg/kg	PASS
Cadmium	NF EN ISO 11885	*17*	< 1 mg/kg	PASS
Chromium III	NF EN ISO 11885	*460*	< 10 mg/kg	PASS
Chromium VI	NF T 90-043	*0.2*	< 0.1 mg/kg	PASS
Cobalt	NF EN ISO 11885	*130*	< 10 mg/kg	PASS
Copper	NF EN ISO 11885	*7,700*	< 50 mg/kg	PASS
Lead	NF EN ISO 11885	*160*	< 10 mg/kg	PASS
Manganese	NF EN ISO 11885	*15,000*	< 50 mg/kg	PASS
Mercury	NF EN 13506	*94*	< 10 mg/kg	PASS
Nickel	NF EN ISO 11885	*930*	< 10 mg/kg	PASS
Selenium	NF EN ISO 11885	*460*	< 10 mg/kg	PASS
Strontium	NF EN ISO 17294-1 et 2	*56,000*	< 50 mg/kg	PASS
Extractable Tin (Sn)	NF EN ISO 17294-1 et 2	*180,000*	< 50 mg/kg	PASS
Extractable Organic Tin	NF EN ISO 17294-1 et 2	*12*	< 0.2 mg/kg	PASS
Zinc	NF EN ISO 17294-1 et 2	*46,000*	< 50 mg/kg	PASS

*Limits per European Standard EN 71-3 – Safety of Toys Part 3: Migration of certain elements.

SPORTS LABS USA
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Telephone: (603) 715 5453 ● E-Mail: Info@sportslabsusa.com

Article Published July 5, 2016

GHSBC Votes for Coated Sand Artificial Turf Field

Zoe Roos, Staff Writer

After many heated discussions in town over the fourth turf field to be installed at the new Guilford High School (GHS), the Guilford High School Building Committee (GHSBC) reached a final decision on June 28. After concerns were raised over the possible impact of crumb rubber, the committee voted to move forward with an artificial turf field with a coated sand infill, also known as Enviro-fill.

The committee voted to move forward and submit a recommendation to the Board of Selectmen (BOS) to contract with RAD Sports to construct a coated sand synthetic turf field for $1,151,100. Before voting, the committee considered suggestions and recommendations from the Standing Fields Committee and the Board of Education and discussed the financial and health implications of the various options.

GHSBC member Bill Mulligan explained that the original $950,000 budget figure used in earlier discussions had served as a placeholder. He said it was within the committee's purview to change that number and pick an option that was best for the town.

"I was surprised at the relatively low cost differential between the crumb rubber and the coated sand," he said. "I think we are never going to make everyone happy; that said, I think it would go a long way to approve a more health-conscious material and allow people to spend more time focusing on the $89 million of this [new high school] project and not the remaining million."

Most committee members agreed that an artificial turf field, while having a higher initial instillation cost, was the better financial option for the town in the long term. Committee member Bob Jacobs said grass would be too expensive.

"All the numbers I have read have convinced me that a grass field is actually more expensive over 10 or 20 years than a turf field," he said.

While Jacobs said the financial aspects of the project are important, when considering infills the committee needed to think about the students on the field.

"The financial responsibility to me is irrelevant if we are not more concerned with our children," he said. "I don't want to find out 10 years from now that they prove there is a problem with crumb rubber. I don't think it is in the best interest of our community to install it. Sand has been around since the earth was created; I don't believe we are going to find any problem with sand in the years to come."

Committee member Mary Beeman said she, too, was in support of the coated sand infill after the months of backlash from the community over crumb rubber.

"I am actually in favor of the least expensive option, which is the crumb rubber, however because of the firestorm from the public on crumb rubber, I simply want to avoid further firestorm," she said. "It is as simple as that. So that is why I have changed from voting for the least expensive synthetic field to the most expensive turf field we have on our plate."

For now, Freeman said the administration will be pleased with a coated sand artificial turf field.

“[GHS Athletic Director Jake] Jarvis and I visited a sand infill field that was recently constructed in South Windsor,” he said. “We were perfectly happy with the playability of the surface we saw. We brought soccer balls, lacrosse balls, field hockey balls, and we were very happy with the results.”

Guilford Residents Concerned About Turf member Paul Lenois said he was pleased with the committee’s final decision

“It has been my main goal this whole time to not have a crumb rubber field installed,” he said. “While I would have preferred the less expensive natural grass field, I am happy that the BOE and GHSBC cooperatively decided to use an alternative infill for the new synthetic turf practice field.”

Construction of the field is expected to begin this summer.

MICROBAN®
Antimicrobial Product Protection: An Overview

Microban™
antimicrobial product protection

What is Microban antimicrobial product protection?

Microban technology is built-in antimicrobial protection that gives products an added level of protection against microbes such as stain and odor causing bacteria, mold and mildew.

How do products with Microban antimicrobial protection work?

Microban protection inhibits the growth of microorganisms. When microbes come in contact with the product surface, Microban protection penetrates the cell wall of the microorganism and disrupts cell functions, making the microorganism unable to function, grow and reproduce.

What benefit do I get from products with Microban antimicrobial protection?

Microban protection continuously fights the growth of microbes such as odor and stain causing bacteria, mold and mildew. Microban protection makes products easier to clean and keeps them cleaner between cleanings.

What types of microorganisms does Microban protection work against?

Microban antimicrobial protection is effective against most common bacteria, yeasts, molds and fungi that cause stains, odors and product degradation. Microban technology is not designed to protect users from disease-causing microorganisms.

How do I know that Microban antimicrobial product protection is safe?

Microban technology has undergone extensive independent laboratory testing and has a long history of safe use. It is registered with the EPA for all applications in which it is used. Microban additives can be found in leading consumer and industrial products around the world.

Does this mean I don't have to clean my products as much or as carefully?

No. Microban protection provides continuous antimicrobial protection that protects the products, making them easier to clean and keeping them cleaner between cleanings. However, normal cleaning practices should be maintained.

Does Microban protection begin working immediately?

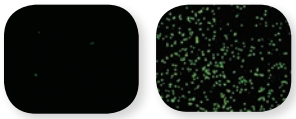
Microban protection begins to work as soon as the microorganism comes into contact with the product surface. Under the right conditions, microbes on an untreated surface can double every 20 minutes! Microban technology is not a disinfectant and is not a substitute for normal cleaning practices.

How long does Microban antimicrobial protection work?

Microban protection is built-in during the manufacturing process and will not wash off or wear away. Microban protection is engineered to provide continuous antimicrobial product protection for the useful lifetime of the product.

Which Phifer products contain Microban antimicrobial product protection?

Most SheerWeave® interior shading fabrics; SunTex® exterior shading fabrics; Phifertex® outdoor furniture fabrics; and BetterVue®, UltraVue®, PetScreen® and TuffScreen® insect screening products contain MICROBAN antimicrobial protection. For the most current list of products, please contact your Phifer customer service representative.



24 Hours with MICROBAN | 24 Hours Unprotected

PHIFER INCORPORATED

FAQ's About Antimicrobials, Definitions & More

1. What is the definition of antimicrobial?

An antimicrobial is a substance that acts to inhibit the growth of microorganisms and suppresses microorganism reproduction.

2. What is Microban® antimicrobial product protection?

Microban technology is built-in protection for solid products, coatings and fibers. This provides an added level of protection against damaging microbes such as, bacteria, mold and mildew that can cause stains, odors and product deterioration.

3. How does Microban antimicrobial protection work in my product?

Microban protection is built-in to the product during the manufacturing process. When microbes come in contact with the product surface, Microban protection penetrates the cell wall of the microorganism and disrupts the cell, making the microorganism unable to grow and reproduce.

4. What benefit do I get from products with Microban antimicrobial protection?

Microban protection continuously prevents the uncontrolled growth of microbes that cause stains, odors and product degradation. Microban protection makes the products in your home easier to clean and keeps them cleaner and fresher between cleanings.

5. What types of microorganisms does Microban protection work against?

Microban antimicrobial protection is effective against most common bacteria, yeasts, molds and fungi that cause stains, odors and product degradation. Microban technology is not designed to protect users from disease causing microorganisms.

6. How do I know that Microban antimicrobial product protection is safe?

Consumer safety is a fundamental concern for us. All of the antimicrobials used by MPC are approved by the US EPA for their specific use in the product in which they are used, and have a history of safe use in consumer, industrial and medical products applications around the world. Risk assessments by independent scientists, scientific bodies and governmental agencies (including EPA, FDA and regulatory authorities in Europe and Canada) have consistently reconfirmed the safety of our antimicrobial additives at the levels approved for use in consumer, industrial and medical products . The size and specific biological systems of microorganisms make them susceptible to antimicrobial agents at levels of exposure that are not harmful to us. Because our antimicrobial additives are built into the products themselves, using products protected with Microban® protection does not result in consumer exposures or transmission directly into the environment in the way that products like disinfectants or liquid antibacterial soaps do during use.

7. Does this mean I don't have to clean my products as much or as carefully?

No. Microban protection provides continuous antimicrobial protection that protects the products in your home, helping to make them easier to clean and keeping them cleaner between cleanings. However, normal cleaning practices recommended by the product manufacturer should be maintained.

8. Does Microban protection begin working immediately?

Microban protection begins to work as soon as the microorganism comes into contact with the product surface. It then works continuously to maintain a consistently lower bio-burden than would be expected on a product without Microban antimicrobial protection. Under the right conditions, microbes on an untreated surface can double every 20 minutes. Microban technology is not a disinfectant and is not a substitute for normal cleaning practices.

9. How long does Microban antimicrobial protection work?

Microban protection is built-in during the manufacturing process and will not wash off or wear away. Microban protection is engineered to provide continuous antimicrobial product protection for the useful lifetime of the product, keeping the treated products in your home cleaner and fresher for longer than ever before.

10. Does the use of antimicrobials cause resistant strains of microorganisms?

After more than 30 years of use in numerous consumer, industrial and medical applications around the world, there has been no evidence of resistant strain development.

USGreentech

THE PERFORMANCE YOU'VE ALWAYS WANTED.

The last infill you'll ever need.

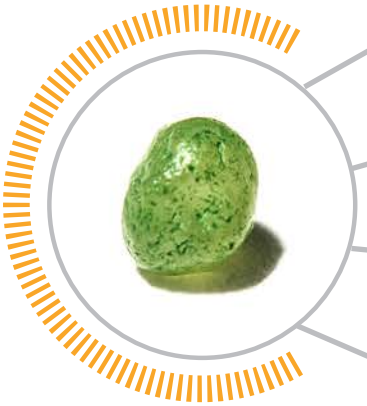
envirofill®
SPORTS

THE TURF INFILL CHAMPION
Maximum Playability

> An athletic turf infill with expert playing characteristics and an energy absorbing strength.
>
> *- Ken Kushner, Executive Director, Anderson Parks*

Envirofill® is the infill of choice for sports fields everywhere. It's tough enough for any game and players love it for its safety and performance. **Envirofill** has been made in Texas since 2005 from non-toxic components and is backed by a 16-year warranty.

Benefits



Maximum playability. Athletes benefit from Envirofill's firm, fast, safe, and consistent surface. Its highly-rounded quartz core resists compression so it doesn't compact over the life of the field.

It's cool. Envirofill's natural heat-reducing properties have been proven to lower synthetic surface temperatures by up to 25%. It resists changes brought on by even the harshest weather conditions.

It's cleaner. Microban® antimicrobial protection is infused into Envirofill during the manufacturing process to help prevent the growth of bacteria, mold, and mildew that can cause stains, odors, and product deterioration.

It's reusable. Because of its superior durability, Envirofill can be repurposed for multiple turf lifecycles with no decrease in performance.

Envirofill's exclusive partnership with Microban provides an added level of antimicrobial protection for the lifetime of your infill.

www.**usgreentech**.com infills/envirofill

Contact us today at: 800.548.0402

USGreentech

envirofill SPORTS

SECTION 1: Product and Company Information

Product Name: Brite Stripe - All Colors Trade Name: Brite Stripe

Product Code: ATHBLA5, ATHBL5, ATHBRO5, ATHBUR5, ATHBY5, ATHCRED5, ATHDBL5, ATHDG5, ATHDGR5, ATHGBLA5, ATHGY5, ATHGRE5, ATHLRED5, ATHLBL5, ATHMAR5, ATHNBL5, ATHOG5, ATHOR5, ATHPINK5, ATHPUR5, ATHRED5, ATHRSB5, ATHSIL5, ATHSBL5, ATHSIL5, ATHVG5, ATHY5, ATHSY5, ATHC*(all custom colors)

PIONEER ATHLETICS
4529 INDUSTRIAL PARKWAY
CLEVELAND OHIO
800-877-1500

For chemical emergency call INFOTRAC 1-800-535-5053,
24 hrs. per day 7 days a week

SECTION 2 - HAZARDS

GHS Ratings:

GHS Hazards

GHS Precautions

Signal Word:

There are no GHS ratings that apply to this product at this time.

SECTION 3 - COMPOSITION INFORMATION ON INGREDIENTS

This product is not classified as a hazardous mixture.
None of the listed ingredients individually exceen 25% by weight.
The exact percentage of each of these ingredients is being withheld as a trade secret. Some colors and formulations also include Titanium Dioxide (CAS No. 13463-67-7) in a concentration not exceeding 25% by weight which varies by color and formulation. The exact concentration of Titanium Dioxide in each formula where present is being withheld as a trade secret. If present, the Titanium Dioxide in this product is encapsulated and remains encapsulated during the approved use of this product on natural grass.

Chemical Name	CAS number	Weight Concentration %
Acrylic Latex		

SECTION 4 - FIRST AID

Eye Contact:

Prevention: Wear eye protection when mixing or applying paint.

Response: Check for and remove any contact lenses. Immediately flush eyes thoroughly with plenty of water for at least 15 minutes, lifting upper and lower eye lids. See a physician.

Skin Contact:

Prevention: Wear protective gloves when mixing or applying paint.

Response: Wash affected area thoroughly with soap and water.

Seek medical attention for any symptoms, allergic reactions or irritation.

SECTION 5 - FIRE FIGHTING

Flash Point: N/A
LEL: UEL:

Extinguishing Media: This product does not burn. All firefighting media are suitable.
Unusual Fire/Explosion Hazards: None
Specific hazards arising from the chemical: None

Special protective equipment and precautions for fire-fighters: None

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedures: Wear eye protection and gloves when mixing or applying paint.
Prevent further leakage or spillage if safe to do so. Remove with inert absorbent. Wash area with soap and water.

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling: Keep from freezing. If a partial pail is left, cover the paint with a thin layer of water and close container tightly.

Conditions for safe storage, including any incompatibilities: Keep containers tightly closed in a cool, dry, well ventilated place. Store above 40 F.

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

Chemical Name / CAS No.	OSHA Exposure Limits	ACGIH Exposure Limits	Other Exposure Limits
Acrylic Latex	Not Established	Not Established	Not Established

For industrial use only. For use by trained personnel only.
Protective Gear: Wear eye protection and protective gloves when mixing or applying paint.

SECTION 9 - PHYSICAL PROPERTIES

Appearance Liquid	**Odor** mild
Physical State Liquid	**Boiling Point** 100 °C
% Volume Volatile 1.11	**Specific Gravity (SG)** 1.325
Lbs VOC/Gallon Less Water 0.36	

SECTION 10 - STABILITY AND REACTIVITY

STABLE

Reactivity: Hazardous polymerization will not occur.
Chemical stability: Stable
Possibility of hazardous reactions: None
Conditions to avoid: Avoid freezing. Store above 40 F.
Incompatible materials: none
Hazardous decomposition products: None

NOT ESTABLISHED

NOT ESTABLISHED

Hazardous polymerization will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

Mixture Toxicity

Component Toxicity

Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). While this product is not classified as a hazardous mixture, paint may get into eyes or on skin when mixing or applying.

NOT ESTABLISHED
NOT ESTABLISHED

Effects of Overexposure

Weather the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA: IARC's Monograph No. 93 reports there is sufficient evidence of carcinogenicity in experimental rats exposed to titanium dioxide but inadequate evidence for carcinogenicity in humans and has assigned a Group 2B rating - "possibly carcinogenic to humans". The titanium dioxide is the product is encapsulated and remains encapsulated during the approved use of this product.

CAS Number	Description	% Weight	Carcinogen Rating
None			NOT ESTABLISHED

Symptoms related to the physical, chemical and toxicological characteristics: Not classified as a hazardous mixture.
Delayed and immediate effects and also chronic effects from short- and long-term exposure: Not classified as a hazardous mixture.
Numerical measures of toxicity: No applicable information is available

SECTION 12 - ECOLOGICAL INFORMATION

Not addressed in this Safety Data Sheet.

Component Ecotoxicity

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal of wastes and contaminated packaging should be in accordance with local, regional and national laws and regulations.

SECTION 14 - TRANSPORT INFORMATION

not addressed in this safety sheet

Agency	Proper Shipping Name	UN Number	Packing Group	Hazard Class
	NOT ESTABLISHED			

SECTION 15 - REGULATORY INFORMATION

State of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): WARNING! This product contains the following chemicals which are listed by the State of California as carcinogenic or a reproductive toxin:

- None

Country	Regulation	All Components Listed

EU Risk Phrases

Safety Phrase

- None

SECTION 16 - OTHER INFORMATION

Hazardous Material Information System (HMIS)

HEALTH		1
FLAMMABILITY		0
PHYSICAL HAZARD		0
PERSONAL PROTECTION		

HMIS & NFPA Hazard Rating Legend
*** = Chronic Health Hazard**
0 = INSIGNIFICANT
1 = SLIGHT
2 = MODERATE
3 = HIGH

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with other materials or in any process, unless specified in the text.

Reviewer Revision

Date Prepared: 4/7/2016

SAFETY DATA SHEET SDS - BS05G1

SECTION 1: Product and Company Information

Product Name: BRITE STRIPE WHITE Product Code: ATHW1, ATHW5, ATHW3, ATHW55, ATHW175, ATHW255

Trade Name: BRITE STRIPE WHITE

PIONEER ATHLETICS
4529 INDUSTRIAL PARKWAY
CLEVELAND OHIO
800-877-1500

For chemical emergency call INFOTRAC 1-800-535-5053,
24 hrs. per day 7 days a week

Product Use: For industrial use only. For use by trained personnel only. Designed specifically for natural grass - not walls, parking lots, or other surfaces. Protect from freezing.

SECTION 2 - HAZARDS

GHS Ratings:

GHS Hazards

GHS Precautions

Signal Word:

There are no GHS ratings that apply to this product at this time.

SECTION 3 - COMPOSITION INFORMATION ON INGREDIENTS

This product is not classified as a hazardous mixture.
None of the listed ingredients individually exceen 25% by weight.
The exact percentage of each of these ingredients is being withheld as a trade secret.

Chemical Name	CAS number	Weight Concentration %
Calcined Kaolin	92704-41-1	
Acrylic Latex		
Titanium Dioxide	13463-67-7	

(1) The calcined kaolin in this product is encapsulated and remains encapsulated during the approved use of this product.

(2) The titanium dioxide in this product is encapsulated and remains encapsulated during the approved use of this product.

SECTION 4 - FIRST AID

Eye Contact:

Prevention: Wear eye protection when mixing or applying paint.

Response: Check for and remove any contact lenses. Immediately flush eyes thoroughly with plenty of water for at least 15 minutes, lifting upper and lower eye lids. See a physician.

Skin Contact:

Prevention: Wear protective gloves when mixing or applying paint.

Response: Wash affected area thoroughly with soap and water.

Seek medical attention for any symptoms, allergic reactions or irritation.

SECTION 5 - FIRE FIGHTING

Flash Point: N/A

LEL: UEL:

Extinguishing Media: This product does not burn. All firefighting media are suitable.
Unusual Fire/Explosion Hazards: None
Specific hazards arising from the chemical: None

Special protective equipment and precautions for fire-fighters: None

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedures: Wear eye protection and gloves when mixing or applying paint.
Prevent further leakage or spillage if safe to do so. Remove with inert absorbent. Wash area with soap and water.

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling: Keep from freezing. If a partial pail is left, cover the paint with a thin layer of water and close container tightly.

Conditions for safe storage, including any incompatibilities: Keep containers tightly closed in a cool, dry, well ventilated place. Store above 40 F.

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

Chemical Name / CAS No.	OSHA Exposure Limits	ACGIH Exposure Limits	Other Exposure Limits
Calcined Kaolin 92704-41-1	15 mg/m3 Total Dust 5mg/m3 Respirable Dust	1mg/m3 Respirable Dust	Not Established
Acrylic Latex	Not Established	Not Established	Not Established
Titanium Dioxide 13463-67-7	TWA: 10mg/m3	TWA: 15 mg/m3	NIOSH Immediately dangerous to life or health concentration is 5000 mg/m3

For industrial use only. For use by trained personnel only.
Protective Gear: Wear eye protection and protective gloves when mixing or applying paint.

SECTION 9 - PHYSICAL PROPERTIES

Appearance Liquid	**Odor** mild
Physical State Liquid	**Boiling Point** 100 °C
% Volume Volatile 1.21	**Specific Gravity (SG)** 1.419
Lbs VOC/Gallon Less Water 0.35	

SECTION 10 - STABILITY AND REACTIVITY

STABLE

Reactivity: Hazardous polymerization will not occur.
Chemical stability: Stable
Possibility of hazardous reactions: None

Conditions to avoid: Avoid freezing. Store above 40 F.
Incompatible materials: none
Hazardous decomposition products: None

NOT ESTABLISHED

NOT ESTABLISHED

Hazardous polymerization will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

Mixture Toxicity
Component Toxicity

Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). While this product is not classified as a hazardous mixture, paint may get into eyes or on skin when mixing or applying.

NOT ESTABLISHED

NOT ESTABLISHED

Effects of Overexposure

Weather the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA: IARC's Monograph No. 93 reports there is sufficient evidence of carcinogenicity in experimental rats exposed to titanium dioxide but inadequate evidence for carcinogenicity in humans and has assigned a Group 2B rating - "possibly carcinogenic to humans". The titanium dioxide is the product is encapsulated and remains encapsulated during the approved use of this product.

CAS Number	Description	% Weight	Carcinogen Rating
None			NOT ESTABLISHED

Symptoms related to the physical, chemical and toxicological characteristics: Not classified as a hazardous mixture.
Delayed and immediate effects and also chronic effects from short- and long-term exposure: Not classified as a hazardous mixture.
Numerical measures of toxicity: No applicable information is available

SECTION 12 - ECOLOGICAL INFORMATION

Not addressed in this Safety Data Sheet.

Component Ecotoxicity

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal of wastes and contaminated packaging should be in accordance with local, regional and national laws and regulations.

SECTION 14 - TRANSPORT INFORMATION

not addressed in this safety sheet

Agency	Proper Shipping Name	UN Number	Packing Group	Hazard Class
DOT	PAINT, NON HAZARDOUS			
IMDG				

SECTION 15 - REGULATORY INFORMATION

State of California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): WARNING! This product contains the following chemicals which are listed by the State of California as carcinogenic or a reproductive toxin:

- None

Country	Regulation	All Components Listed

EU Risk Phrases

Safety Phrase

- None

SECTION 16 - OTHER INFORMATION

Hazardous Material Information System (HMIS)

HEALTH		1
FLAMMABILITY		0
PHYSICAL HAZARD		0
PERSONAL PROTECTION		

HMIS & NFPA Hazard Rating Legend
*** = Chronic Health Hazard**
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Date Prepared: 3/15/2016

Reviewer Revision

CAROLINA EASTERN-VAIL, INC. Drawer B, 831 Route 28 Niverville, New York 12130 (518)784-9166 S.I.C. 5191	**MATERIAL SAFETY DATA SHEET**	CEV-Mountain Green Fertilizer ISSUE DATE: 9/02/2002

I. CHEMICAL PRODUCT

Product name: CEV-Mountain Green Fertilizers (Various Analysis)
EPA Registration Number(s) N/A
Chemical Family: N/A
Chemical Name: N/A
*Chemical name of active: N/A
Shipping Name: Fertilizer compound (Manufactured) NOI, Dry

II. COMPOSITION/INFORMATION ON INGREDIENTS

Exposure Limits.....
Material – Formula – Cas. No. -- % Wt. – Osha-Pel – Acgih-TLV *SEE ADDENUM I

III. PHYSICAL DATA

Density..... 40-70 lb. / ft. 3
Boiling Point ..... N/A, Dry Solid
Melting Point..... Partially decomposes at 212°F
Vapor Pressure..... N/A PH .....6-8 Vapor Density.....N/A
Solubility in Water ..... 40-99% of product is soluble
Appearance and Odor ... Multi-color granules and mild aromatic odor

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method) .....N/A
NFPA Rating .....Health 0♦ Fire 0♦Reactivity 0 ♦Special Hazard 0
Flammable Limits (Lel).....N/A (Uel)……..N/A
Extinguishing Media.....Water, foam, carbon dioxide or dry chemicals

SPECIAL FIRE FIGHTING PROCEDURES: May emit noxious and toxic fumes when heated to decomposition. Self-contained breathing apparatus should be used.

This information is taken from sources or based upon data believed to be reliable: However, Carolina Eastern-Vail, Inc. makes no warranty as to the absolute correctness or sufficiency of any of the foregoing, or that additional or other measures may not be required under particular conditions.

V. REACTIVITY DATA

Stability..... This is a stable material
Conditions to avoid.....Do not store in direct sunlight or at temperatures above 120° F
Incompatibility..... Generally none. Water damages product and may contribute to the release of ammonia vapors.
Hazardous Decompositions
Products ..... Under fire conditions, ammonia, hydrogen chlorides, ethyl sulfide, diethyl sulfide and nitrogen oxides.
Hazardous Polymerization .....Will not occur.

VI. SPILL OR LEAK PROCEDURES:

Steps to be taken in case material is released: In case of release to the environment, report spills to the National Response Center 1-800-424-8802.

Suggested Local Action: Contain spill. Prevent large quantities from contacting vegetation or domestic and natural water sources. If material is not contaminated, collect product and use as intended. If material is contaminated, place in appropriate containers for disposal.

Waste Disposal Method: (EPA Waste Identification No.: N/A) If contaminated with other materials, the nature and extent of contamination may require the use of specialized disposal methods. If disposal is necessary, comply with all local, state, and federal regulations. Contact your local EPA office for information.

For Hazardous Waste Regulation, call 1-800-424-9346 – the RCR A Hotline.

VII. HEALTH HAZARD INFORMATION

EFFECTS OF OVER-EXPOSURE: Indicated below are for the unimpregnated fertilizer. Except under conditions of severe over-exposure, this fertilizer compound is regarded to have a relatively low acute health hazard potential.

INHALATION: Extremely high concentrations of fertilizer dust are typically self-limited due to the nuisance conditions they create. Over-exposure may produce irritation of the mucous membranes, nose, throat, coughing, and shortness of breath. In addition, certain carries may contain small amount of silica particles less than 5 mm in diameter. These silica particles are capable of causing silicosis if inhaled in high enough concentrations over an extended period of time. The principal manifestation of silicosis is difficulty in breathing. This condition can progress to dry cough, shortness of breath on exertion, decreased lung function, and pulmonary fibrosis.

SKIN CONTACT: May cause irritation, particular on damp skin. Repeated or prolonged contact could lead to dermatitis.

EYE CONTACT: May cause irritation and conjunctivitis.

INGESTION: May produce nausea, vomiting, abdominal discomfort; if swallowed in very large amounts, may cause increased urination and central nervous system depression.

EMERGENCY AND FIRST AID PROCEDURE

INHALATION: Remove from exposure. If breathing is difficult or has stopped, administer artificial respiration or oxygen as indicated. Immediately seek medical aid.

SKIN CONTACT: Wash skin thoroughly with soap and water. Seek medical aid.

EYES CONTACT: Flush immediately with large amounts of water, lifting the lower and upper lids occasionally. Seek medical aid.

INGESTION: Give 1-2 glasses of water or milk. Induce vomiting. Seek immediate medical attention. Never give liquids to an unconscious person.

VIII. SPECIAL PROTECTION INFORMATION:

RESPIRATORY: Respiratory protection approved by NIOSH/MSHA for protection against air dust should be used to avoid inhalation. Appropriate respiration selection depends on the type and magnitude of exposure.

SKIN: Clean, body-covering clothing should be worn to prevent irritation in situations where direct contact with product may occur.

EYES: Employees should be required to wear safety glasses in situations where direct contact with the product may result in eye injury.

VENTILATION: Local external ventilation should be used to control worker exposure to below recommended Permissible Exposure Levels (PEL).

OTHER PROTECTIVE EQUIPMENT: Emergency eye wash stations and deluge safety showers should be available in work area.

IX. SPECIAL PRECAUTIONS

PRECAUTION TO BE TAKEN IN HANDLING AND STORAGE: Store in a cool, dry place. **DO NOT** Store near food or feed. Keep out of reach of children and pets.

OTHER COMMENTS: Chronic Effects-Long term exposure to dusts containing fluoride or quartz may produce more severe toxicity. Fluoride of the teeth changes in the kidneys, bones, and ligaments, and inhibition of certain enzymes. Chronic exposure and/or high levels of inorganic fluorides administered to experimental animals have been shown to produce changes in several organs and certain enzymes. Adverse reproductive effects have also been suggested. Of the available animal carcinogenicity data, a single inadequately reported study has provided some evidence of the carcinogenicity of sodium fluoride to mice (IARC27,237,82). Quartz dust may produce nodules in the lungs which, may gradually progress to the formation of fibrous tissue. Symptoms may include coughing, shortness of breath, and wheezing.

ADDENDUM I

Product Name ……CEV-Mountain Green Fertilizer Exposure Limits… See below	MSDS

II. INGREDIENTS AND RECOMMENDED OCCUPATION EXPOSURE LIMITS
NOTE: Consult the guaranteed analysis statement on the above product container to determine which below materials are found in that product.

MATERIALS	FORMULA	CAS. #	% WT.	OSHA-PEL	ACGIH-TLV
Urea	N2H4C0	57-13-6	0-75	NE	NE
Diammonium Phosphate	N2H9P04	7783-28-0	0-40	55ppm(as NH3)	25ppm (as NH3)
Potassium Chloride	KCL	7447-40-7	0-70	NE	NE
Limestone	CaC03	1317-65-3	0-50	NE	NE
Dolomitic Limestone	CaCO3(+MgC03)	16389-88-1	0-40	NE	NE
Ammonium Sulfate	N2H8S04	7783-20-2	0-75	50ppm(asNH3)	25ppm (as NH3)
Potassium Sulfate	K2S04	7778-80-5	0-20	NE	NE
Super Phosphate	CaH4-208	7758-23-8	0-10	NE	NE
Corncobs(Pulverized)	--	NE	0-60	NE	NE
Calcium Lignosulfonate	--	68131-31-7	0-01	NE	NE
Conditioners, Impurities	--	NE	0-01	NE	NE
Sulfur Coated Urea	NA	NE	0-25	NE	NE
Urea Formaldehyde	NA	9011-05-6	0-25	NE	NE
Nutralene	NA	NE	0-25	NE	NE
Monoammoium Phosphate	NH4H2P04	7722-76-1	0-40	15mg/m3	15mg/m3
Potassium Nitrate	NA	7757-79-1	0-50	ND	ND
Sodium borate	--	11130124	--	10mg B203/m3	--
Copper Oxide	--	1317391	--	1mg Cu/m3	--
Copper Sulfate	--	7758998	--	1mg Cu/m3	--
Iron Oxide	--	1332372	--	5mg Fe/m3	--
Iron Sulfate	--	7720787	--	1mg Fe/m3	--
Manganese Oxide	--	1344430	--	1mg Mn/m3	--
Manganese Sulfate	--	7785877	--	1mg Mn/m3	--
Sodium Molydate	--	7631950	--	5mg Mo/m3	--
Zinc Oxide	--	1314132	--	5mg Zn/m3	--
Zinc Sulfate	--	7733020	--	5mg Zn/m3	--

The following dust limits apply:

CLASS	OSHA-PEL	SCGIH-TLV
Total Dust (In Air)	15 mg/m3	10 mg/m3
Respirable Dust (In Air)	5 mg/m3	5 mg/m3