February 28, 2007

North Coast Regional
Water Quality Control Board
Attention: Bruce Gwynne
5550 Skylane Boulevard
Santa Rosa, CA, 95403

Re: Data Solicitation, 2008 Clean Water Act 303(d) List of Impaired Waters

Mr. Gwynne:

On behalf of the board, staff and supporting members of Humboldt Baykeeper, I would like to thank the North Coast Regional Water Quality Control Board ("Regional Board") for the opportunity to provide information related to the updating of California's 2008 Clean Water Act 303(d) List of Impaired Waters ("CWA 303(d) List"). We appreciate the immensity of this undertaking, and the time and effort that will be involved in this review for the protection of our waters.

This letter is written to supplement those comments already submitted by Humboldt Baykeeper for the preparation of the 2006 CWA 303(d) List related to the impaired condition of Humboldt Bay by dioxin. Since the submittal of our original comments, additional data is available that should be included in the assessment of water quality on Humboldt Bay. These data include sediment and biota sampling conducted by the Regional Board in 1989 and 1990, and sediment data collected by Humboldt Baykeeper in April of 2006 in relation to a lawsuit seeking cleanup of a contaminated industrial site adjacent to Humboldt Bay. We believe these data further support the inclusion of Humboldt Bay on the CWA 303(d) List as impaired for dioxins.

In addition to the above referenced data, we believe that it is important to note that the water quality objective under which Humboldt Bay has been listed as impaired for dioxins is not only designed to be protective of human health but is also supposed to be protective of plant, animal and aquatic life. Water Quality Control Plan for the North Coast Region at 3-4.00. Though the potential impacts to organisms other than humans can be difficult to quantify, they must also be considered with regards to the quality of Humboldt Bay waters, and the potential impacts of dioxin contamination. In furtherance

of a complete analysis, we have compiled and attached summaries of a number of articles that discuss these potential impacts as Exhibit A.

1989 and 1990 Regional Board Sampling

Dioxins and furans were discovered in the effluent of Humboldt Bay's two pulp mills and were also found in Dungeness Crab and Pacific Tomcod tissues near where the pulp mills discharged their effluent. In an effort to investigate background dioxin levels, the Regional Board collected and analyzed mussels and oysters from 13 sites along the North Coast, from Crescent City to Bodega Bay. Three of the thirteen samples were collected inside Humboldt Bay, and one sample was collected in the Pacific Ocean just outside Humboldt Bay at its mouth. The analytical laboratory results showed that the mussels sampled within the Bay were ten to forty times higher in dioxin than the mussels collected outside the Bay. Both Bay mussel samples (1.15 ppt and 4.26 ppt) greatly exceed the OEHHA screening value of .3 ppt. The composite oyster sample collected in the Bay found a dioxin level of 10.9 ppt, over 36 times the OEHHA screening value.

Mussels, oysters, and starry flounder in Humboldt Bay were sampled again the following year by the Regional Board. A total of five samples were taken from within the Bay, three of which had levels of dioxins that exceed the OEHHA screening value of .3ppt.

Humboldt Baykeeper Sediment Sampling

In April of 2006 Humboldt Baykeeper's consultant Soil, Water, Air Protection Enterprise ("SWAPE") conducted sediment sampling in Humboldt Bay and in a ditch adjacent to a former Plywood Mill that drains directly into Humboldt Bay. This sampling event found dioxin levels that ranged from 4.07 ppt. TEQ to 89,000 ppt TEQ. The samples taken directly in the Bay had results of 12.02 ppt. TEQ, 46.04 ppt. TEQ and 60.67 ppt. TEQ. The sampling report and analytical results are attached hereto as Exhibit B.

Though the listing of Humboldt Bay as impaired for dioxin was based upon biota sampling and the violation of water quality objectives not attached to sediment contamination levels, this data further supports the listing determination. The water quality objective determined to be violated states that "waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life." Water Quality Control Plan for the North Coast Region at 3-4.00. The dioxin found in Bay sediments and in the sediments of the ditch adjacent to the Bay have the potential to impact this water quality objective when they are mobilized by physical disturbance of the Bay bottom or during large rainfall events.

Department of Health Services Biota Sampling

In March of 2006 the California Department of Health Services ("DHS") provided information to the Pacific Shellfish Institute of Olympia Washington regarding the impact of dioxin on shellfish harvested from Humboldt Bay in relation to the contamination caused by Sierra Pacific Industries. *See* letter from Michael Hernandez to Mary Middleton, attached as Exhibit C. In this letter DHS presented the results of sampling conducted in April of 2003, where they found levels of dioxin TEQs that ranged from 0 to 0.17 ppt from 34 samples of aquacultured oysters, mussels, clams, and wild clams and 14 sediment samples. *Id.*

Unfortunately, there is no sampling report, chain if custody documents, field notes, analytical laboratory reports, or quality assurance and control documents associated with these data. Therefore, it is impossible to determine sample size, collection techniques, storage and handling information, sampling methodology, reporting limits, specific congeners sampled, TEQ calculations and a host of additional information needed to asses the data. Therefore, we do not believe this data meets the data quality requirements of section 6.1.4 of the listing policy.

Use of Appropriate Screening Values and Sampling Methods for Human Health and Ecological Risk Assessment

Some entities who are opposed to this listing have argued that the SWRCB improperly relied on fish tissue screening values adopted by OEHHA. However, section 6.1.3 of the listing policy clearly allows the State or Regional Boards to apply evaluation guidelines published by OEHHA or the USEPA for protection from the consumption of fish and shellfish. Although we believe the OEHHA levels may be properly relied on, for the following reasons we believe the USEPA guidelines set out in its policy document entitled "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories," (EPA 823-B-00-007, November 2000, *available at* http://www.epa.gov/waterscience/library/fish/) is more appropriate for screening dioxin risks to humans.

In 1998, acting upon concerns over elevated levels of persistent organic chemicals in fish from San Francisco Bay, the California Department of Health Services and the San Francisco Estuary Institute conducted a San Francisco Bay Seafood Consumption Study ("SF Study"). San Francisco Bay anglers were interviewed to gather information on ethnicity and fish consumption to identify which anglers may be at risk and to develop educational campaigns in an effort to reduce the risks of chemical exposures. The SF Study found that some contaminants in fish concentrate in fatty tissues, such as the skin and internal organs. Asian anglers were found more likely than other ethnic groups to eat the skin of fish, eat the cooking juices, and eat the fish raw or whole in soup, all of which increase their exposures to contaminants. Fish skin consumption was also found to be

more frequent with anglers of lower income and education. *See* SF Study, *available at* http://www.sfei.org/rmp/sfcindex.htm.

Dioxin compounds are known to accumulate in the fatty tissues of animals and are not uniformly distributed throughout the edible tissue. Dioxin is an extremely potent reproductive and developmental toxicant that can cause adverse effects at very low exposure levels. Dioxin is also recognized by the State of California as a human carcinogen. For these reasons, an abundance of caution is required to prevent risks to potentially exposed populations.

The Humboldt Bay area has a sizeable population of Asians, Native Americans, and low income families. The SF Study indicates that these populations may be at greatest risk for toxic exposures caused by ingestion of locally-caught fish and shellfish.

We believe the US EPA recommended screening value for dioxin exposures to subsistence fishers, .03 parts-per-trillion, is the most protective and appropriate screening value. Furthermore, it is critical that any dioxin sampling of fish used to evaluate the risks from Humboldt Bay seafood consumption be conducted with skin-on or whole-fish samples.

Conclusion

Additional data which has become available since Humboldt Bay was placed on the CWA 303(d) List as impaired for dioxins further supports the Bay's placement on the list. In addition to the information included above, and the data and original petition submitted by Humboldt Baykeeper for the listing of Humboldt Bay in January of 2006, the Regional Board should include in its' analysis any dioxin data obtained as a result of oversight or other activities related to contaminated sites located on Humboldt Bay. Of special concern are any and all sites that were used for timber production activities, such as wood preservative and wood protection sites that used pentachlorophenol or tetrachlorophenol containing compounds. As mentioned above, potential impacts to organisms other than humans must also be considered in this analysis.

Sincerely,

_____/s/_____

Michelle D. Smith
Staff Attorney
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217 'E' Street
Eureka, CA 95501
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michelle@humboldtbaykeeper.org

Exhibit A

FISH

Geisy, J. P., P. D. Jones, K. Kannan, J. L. Newsted, D. E. Tillitt, and L. L. Williams. 2002. **Effects of chronic and dietary exposure to environmentally relevant concentrations of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin on survival growth reproduction and biochemical responses of phenol rainbow trout (*Oncorhynchus mykiss*).** Aquatic Toxicology 59: 35-53.

This study demonstrated adverse effects of TCDD to both adults and fry at concentrations comparable to current environmental concentrations, suggesting that direct adult toxicity as well as reproductive endpoints need to be incorporated in the current risk assessment paradigm for these compounds. Survival of adult female trout was reduced in a dose-dependent manner by exposure to TCDD in the diet. Fish fed 1.8 ng/kg moist weight of diet showed significantly reduced survival compared with those fed the control diet. TCDD also affected survival of fry from females fed 1.8 ng/kg TCDD.

Miller, R. A., L. A. Norris, and C. L. Hawkes. 1973. **Toxicity of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) in aquatic organisms**. Environmental Health Perspectives 5:177-186.

In chronic toxicity tests, young coho salmon were found to be highly sensitive to dioxins in water. TCDD concentration of the 0.056 ppt in water caused 12% mortality after a 60-day exposure period, compared with 2% in controls. TCDD exposure had more negative effects on smaller fish, with a linear and highly significant relationship between survival time and body length. Growth reduction and mortality were also observed in young rainbow trout that were fed dioxin-contaminated food, but further experimentation was recommended to quantify oral exposure toxicity.

Sijm, T. H. M. and A. Opperhuizen. 1996. Dioxins: An Environmental Risk for Fish? In Beyer, W. N., G. H. Heinz, and A. W. Redmon-Norwood, editors. **Environmental contaminants in wildlife: Interpreting tissue concentrations.** SETAC Special Publication Series, Clemson University: Clemson, South Carolina.

This literature review found that lethal body burdens to fish are similar to the TCDD dose lethal to the most sensitive mammal, the guinea pig. Early life stage mortality responses to TCDD are found at body burdens of 0.065 $\mu g/kg_{egg}$ in lake trout and 0.24-0.4 $\mu g/kg_{egg}$ in rainbow trout. The lowest observed effect concentration (LOEC) of TCDD for rainbow trout eggs is found at a concentration lower than 0.1 ng/L, which is estimated to give a body burden of <0.0003 $\mu g/kg_{egg.}$ Coho may be very sensitive to TCDD, which may explain their much lower lethal body burden of 0.054 µg/kg compared with bluegill, rainbow trout etc.

Sublethal effects are observed at body burdens estimated at between <0.003 and 8.3 µg/kg space for early life stages, and between <0.054 and 30 µg/kg for older fish.

BIRDS

Davis, J. A., D. M. Fry, and B. W. Wilson. 1997. **Hepatic ethoxyresorufin-*O*-deethylase activity and inducibility in wild populations of double-crested cormorants (*Phalacrocorax auritus*).** Environmental Toxicology and Chemistry 16(7): 1441-1449.

Cormorant embryos were collected from Humboldt Bay, San Francisco Bay, and a reference site in coastal Oregon. Biomarkers of exposure to TCDD, PCBs, and other compounds that bind to the aryl hydrocarbon (Ah) receptor were fourfold higher in Humboldt Bay embryos than the reference site median. These findings suggest that cormorant embryos in Humboldt Bay were exposed to concentrations of dioxinlike compounds that are at the threshold for toxic effects in the species. The 1994 Humboldt Bay median was193 pmol/min/mg.

Elliott, J. E., M. L. Harris, L. K. Wilson, P. E. Whitehead, and R. J. Norstrom. 2001. **Monitoring temporal and spatial trends in polychlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs) in eggs of great blue heron (*Ardea herodias)* on the coast of British Columbia, Canada, 1983-1998.** Ambio 30 (7): 416-428.

This study documents the PCDD and PCDF concentrations in eggs of great blue heron collected before, during, and after the elimination of dioxin and chlorophenolic wood preservatives in the lumber, pulp, and paper industries. Positive associations between fish and heron PCDD and PCDF concentrations were observed for all congener families.

Loonen H., C. van de Guchte, J. R. Parsons, P. de Voogt, H. A. Govers. 1996. **Ecological hazard assessment of dioxins: hazards to organisms at different levels of aquatic food webs (fish-eating birds and mammals, fish and invertebrates).** Science of the Total Environment (1-3):93-103.

The authors developed models to assess ecological hazards to different classes of animals based on a literature review of laboratory studies of toxic effects. The assessment suggests that fish-eating birds and fish-eating mammals experience larger hazards from dioxins and related compounds than fish, although early life stages of fish appear to be very sensitive to dioxin. The authors concluded that the species probably at greatest risk are tertiary predators, for which prey to predator transfer may occur several times. Since

these predators were not specifically included in the model, the authors state that the hazards for top predators may be even larger than presented in this study.

NEC_{water} values (derived no effect concentration in water) were extrapolated from experimentally determined toxicity data of 2,3,7,8-TCDD (see Table 4 for extrapolation factors used):

Species	NEC_{water} (pg/L)
Fish	
Lake trout embryo	0.170
Rainbow trout	0.46
Fish-eating mammals	
Mink	0.050-0.110
Other mammals	
Rat	0.110
Guinea pig	0.015
Fish-eating birds	Not available
Other birds	
Chicken embryo	0.0013-0.0029

Sanderson, J. T. and G. D. Bellward. 1995. **Hepatic microsomal ethoxyresorufin O-deethylase-inducing potency in ovo and cytosolic Ah receptor binding affinity of 2,3,7,8-tetrachlorodibenzo-p-dioxin: comparison of four avian species.** Toxicology and Applied Pharmacology 132:131-145.

This laboratory study produced dose-response curves by injecting various doses of TCDD into developing eggs of four bird species. These compounds cause a similar profile of toxicity in the mammalian and avian species, both in the laboratory and in the wild, including mortality, weight loss, edema, hepatotoxicity, teratogenicity, immunotoxicity, reproductive toxicity promotion of cancer, and enzyme induction.

Species	Effect	Dioxin Level
Great blue heron	30% mortality/day-old chicks	0.5 ug/kg_{egg}
	Subcutaneous edema in 57% of survivors	0.5 ug/kg_{egg}
Double-crested cormorant	38% mortality/day old chicks	3.0 ug/kg_{egg}
	Subcutaneous edema in 20% of survivors	3.0 ug/kg_{egg}

ENDOCRINE DISRUPTION AND SUBLETHAL EFFECTS

Colburn, T., F. S. vom Saal, and A. M. Soto. 1993. **Developmental effects of endocrine-disrupting chemicals in wildlife and humans.** Environmental Health Perspectives 5: 378-384.

Ample evidence exists from both in vivo and in vitro studies that dioxin can antagonize the action of estrogen in some estrogen target cells. The fact that dioxin is antiestrogenic is important because the conversion of androgen to estrogen in some target cells plays a critical role in masculinization. A series of studies describing the dose-related inhibition (dose range: 0.064-1.0 pg/kg/body weight to the dam) of masculinization and persistence of feminine traits in male rat offspring whose dams were fed one meal of dioxin during pregnancy at a critical period during sexual differentiation illustrates the vulnerability of the male rat fetus in utero to administration of only one low dose of dioxin to the dam. In these studies the effects were not fully manifested until the rats reached adulthood. These effects would be expected from either chronic, low-dose exposure to dioxin before pregnancy or to a single exposure during a critical time in pregnancy.

Crisp, T. M. et al. 1998. **Environmental endocrine disruption: An effects assessment and analysis.** Environmental Health Perspectives 106: 11-56.

Various sublethal effects of dioxins have been documented in wildlife species, including abnormal thyroid function in salmon and gulls and decreased hatchability in wood ducks, Forster's terns, and snapping turtles (see Table 4).

Exhibit B

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

SOIL/WATER/AIR PROTECTION ENTERPRISE
201 Wilshire Boulevard, Second Floor
Santa Monica, California 90401

Matt Hagemann
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August 10, 2006

Mr. Fred Evenson
Law Offices of Fredric Evenson
424 First Street
Eureka, California 95501

Subject: **Preliminary Assessment of Pentachlorophenol and Dioxin in Sediment Located Adjacent to the Former Simpson Plywood Plant, Eureka, California**

Dear Mr. Evenson:

This report summarizes the procedures and analytical results for sampling of sediments located adjacent to the former Simpson Plywood Plant located at 1200 Del Norte Street in Eureka, California (Site). A total of nine sediment samples were collected adjacent to the Site on April 17 and 18, 2006. One background sediment sample was collected on April 18, 2006 at a location in the southern portion of Humboldt Bay at Hookton Slough. Sampling was performed in accordance with SWAPE's Sampling and Analysis Plan (SAP), dated April 16, 2006 (see Attachment 1), and in accordance with applicable regulatory agency guidelines.

The objectives of this sampling assessment, as stated in the SAP, were to:

- Determine if pentachlorophenol (PCP) and dioxin are present at elevated concentrations in sediments located adjacent to the Site;
- Compare analytical results to agency screening values to evaluate impacts to human and ecologic receptors; and
- Compare analytical results for samples collected adjacent to the Site with the results for: (1) one sediment sample collected approximately 25 feet north and upstream of the Site; and (2) one sediment sample collected in the southern portion of Humboldt Bay at Hookton Slough.

Sampling Methodology

Samples were collected adjacent to the Site in two areas: (1) along the eastern perimeter of the Site, just outside of the fence line, in a channelized tributary (East Ditch) to Humboldt Bay; and (2) in the mud flat of Humboldt Bay, exposed at low tide, on the western perimeter of the Site (see Figure 1). A sample was also collected in Hookton Slough, an area of Humboldt Bay approximately eight miles to the south of the Site. On both days of sampling activities, the weather was sunny and approximately 50 to 65 degrees with a maximum wind velocity of 10 miles per hour.

Sediment was extracted in the field using a new, stainless-steel, barrel-core sampler and slide hammer (AMS Core Sampling Mini Kit). The slide hammer was used to drive the barrel core sampler into the sediment approximately 6-inches to 1-foot in depth below the sediment surface. Sediment samples S-1 through S-7 were collected below a few inches to a few feet of standing water. Sample S-7 is located in an area of Humboldt Bay that feeds Eureka Marsh at high tide. Samples S-8 through S-10 were collected in Humboldt Bay from mud flat areas at low tide where no standing water was present at the time of sampling.

Samples were recovered from the barrel-core sampler and homogenized in stainless-steel bowls using a stainless-steel spatula and then transferred to laboratory-supplied, 4-ounce glass jars. Samples were labeled and then placed into a chilled cooler for shipment to the analytical laboratory via Federal Express. Chain-of-custody documentation was included with the samples and is provided in the laboratory analytical report (see Attachment 2).

Conditions in the field at each sampling locale were recorded on field forms (see Attachment 3). Coordinates of the sampling locations were recorded in the field with a hand-held GPS device. Sample locations were also referenced to buildings and other features on the former Simpson property and were recorded in field notes (Attachment 4).

All sediment sampling equipment and sample preparation tools were thoroughly decontaminated prior to and between each use. Decontamination procedures were performed in accordance with the SAP and included washing sampling equipment, bowls and spatulas with Liquinox, followed by successive rinses with bottled water, de-ionized water, acetone, and hexane. Following decontamination, all equipment was allowed to air dry prior to re-assembly.

Analytical Results

Samples were submitted to Severn Trent Laboratories in Sacramento, California for analysis. Pentachlorophenol was analyzed in sediment samples using a modified U.S. EPA Method 8151. Dioxin analysis was conducted using U.S. EPA Method 8290. The analytical results for the sediment samples are summarized in Figure 1 and in the following table (Table 1). The complete laboratory analytical report is included in Attachment 2.

Table 1
Summary of Analytical Results for PCP and
Total Dioxin TEQ in Sediment Samples

Sample ID/Location	Lat./Long	Collection Date	PCP (ug/kg)	Dioxin (Total TEQ) (pg/gm)
S-1 (E. Ditch)	40°47.620'N, 124°11.096'W	April 17, 2006	2.6	4.07
S-2 (E. Ditch)	40°47.596'N, 124°11.063'W	April 17, 2006	130	2,140.50
S-3 (E. Ditch)	40°47.526'N, 124°11.092'W	April 17, 2006	1400	23,739.00
S-4 (E. Ditch)	40°47.550'N, 124°11.085'W	April 17, 2006	86,000	89,220.00
S-5 (E. Ditch)	40°47.507'N, 124°11.104'W	April 17, 2006	140	20,678.00
S-6 (E. Ditch)	40°47.450'N, 124°11.124'W	April 17, 2006	4.3	58.74
S-7 (E. Ditch)	40°47.436'N, 124°11.130'W	April 17, 2006	2.8	46.04
S-8 (Mud Flat)	40°47.570'N, 124°11.238'W	April 18, 2006	18	60.67
S-9 (Mud Flat)	40°47.539'N, 124°11.217'W	April 18, 2006	9.1	12.02
S-10 (Hookton)	40°40.634'N, 124°13.257'W	April 18, 2006	19	0.08
NOAA SQuiRT	--	--	17	3.6
EPA Res. PRG	--	--	3,000	3.9

Abbreviations:
ug/kg = micrograms per kilogram (parts per billion)
pg/gm = picograms per gram (parts per trillion)
TEQ = toxic ity equivalent
NOAA SQuiRT = National Oceanic and Atmospheric Administration Screening Quick Reference Tables
EPA Res. PRG = U.S. Environmental Protection Agency residential preliminary remediation goal

East Ditch

Six sediment samples were collected along the East Ditch adjacent to the Site on April 17, 2006. Concentrations of PCP ranged from 2.6 ug/kg in sample S-1, collected 25 feet to the north of the Site, to 86,000 ug/kg in sample S-4, collected adjacent to the Site in an area that was the focus of a remedial effort in 2003. Concentrations of dioxin, expressed as total TEQ, ranged from 4.07 pg/gm in sample S-1 to 89,220 pg/gm in sample S-4. A

sheen was noted in the liquid fraction of the sample S-4 as it was homogenized in the stainless steel bowl prior to transfer to the sample jar. As sample S-4 was homogenized, a strong hydrocarbon odor was also noted. In sample S-7, located in Humboldt Bay adjacent to the Eureka Marsh, dioxin was found at 46.04 pg/gm.

Humboldt Bay Along Western Perimeter

Two sediment samples were collected in the mud flat along the western perimeter of the Site during a low tide on April 18, 2006. Sample S-8 was collected from the log inlet just adjacent to a 5 gallon per minute (gpm) surface water discharge. The water drains to the log inlet from a ditch that runs westerly between the former Simpson property and a log deck to the north (Figure 1). Sample S-9 was collected from an area adjacent to a surface water discharge of 1 gpm that flowed through a hole in a wooden bulkhead that forms the western perimeter of the Simpson property. This location is in the general vicinity of a "septic drain" that has been identified on historical site maps.

Concentrations of PCP ranged from 9.1 ug/kg in sample S-9 to 18 ug/kg in sample S-8. Dioxin ranged from 12.02 pg/g, in sample S-9 to 60.67 pg/gm in sample S-8.

Hookton Slough

A background sample was collected at Hookton Slough on April 18, 2006 for purposes of assessing concentrations of PCP and dioxin in an area that is not industrialized and that is distant from the Site. PCP was detected at 19 ug/kg and dioxin was detected at 0.0840 pg/gm.

Comparison to Agency Screening Levels

Sample results were compared to National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs) to screen for impacts to ecologic receptors in marine sediment (NOAA, 2005). NOAA describes SQuiRTs as useful for identifying substances "which may threaten resources of concern to NOAA." SQuiRTs are accepted by U.S. EPA where the agency has not established ecological screening criteria for contaminants in specific media as is the case with PCP and dioxin in sediment (U.S. EPA, 2006). Sample results were also compared to U.S. EPA Region 9 soil preliminary remediation goals (PRGs) for the protection of human health (U.S. EPA, 2004).

PCP Results

Sediment samples S-2 through S-5, collected along the East Ditch in the area directly to the east of the Site, exceeded the SQuiRT screening concentration of 17 ug/kg for PCP. The maximum PCP concentration, 86,000 ug/kg in sample S-4, exceeded the SQuiRT screening value by more than three orders of magnitude. Sample S-4 exceeded the U.S. EPA Region 9 residential PRG of 3,000 ug/kg for the protection of human health (U.S. EPA, 2004). Sample S-1, collected in the East Ditch 25 feet northeast of the Site, and

samples S-6 and S-7, which bracket Del Norte Street, were below the SQuiRT screening concentration.

Sample S-8, one of two samples collected in Humboldt Bay to the west of the Site, exceeded the SQuiRT screening value for PCP. Neither sample exceeded the U.S. EPA residential PRG. The sample collected from Hookton Slough, sample S-10, had a concentration of 19 ug/kg, exceeding the SQuiRT screening value of 17 ug/kg.

Dioxin Results

The SQuiRT screening concentration for total dioxin TEQ is 3.6 pg/gm for comparison with the laboratory results. The U.S. EPA Region 9 soil PRG is 3.9 pg/gm for the protection of human health under a residential scenario and 16 ppt for an industrial scenario. All samples collected in the East Ditch (S-1 to S-7) had dioxin TEQ concentrations that exceeded the SQuiRT screening value and the U.S. EPA Region 9 residential PRG. The maximum concentration of dioxin TEQ for samples collected in the East Ditch, 89,220 pg/gm in sample S-4, exceeds the SQuiRT screening value and the U.S. EPA Region 9 residential PRG by over four orders of magnitude.

Both samples collected in Humboldt Bay to the west of the Site exceeded the SQuiRT screening value and the U.S. EPA Region 9 residential PRG for dioxin TEQ. The sample collected from Hookton Slough had a dioxin TEQ concentration of 0.0840 pg/gm, less than the SQuiRT value of 3.6 pg/gm and the PRG of 3.9 pg/gm.

Conclusions

PCP and dioxin were detected at elevated concentrations in sediment adjacent to the former Simpson Plywood plant in Eureka, California. Concentrations of PCP in the East Ditch (just to the east of the Site) exceeded the NOAA SQuiRT ecological screening value by up to three orders of magnitude. Dioxin concentrations in the East Ditch exceeded the SQuiRT screening value and the U.S. EPA residential PRG by as much as four orders of magnitude. Concentrations of PCP and dioxin in the sample collected upstream of the Site were the lowest of the seven samples collected along the East Ditch. Dioxin was detected in samples collected in the mud flat to the west of the Site at concentrations that exceeded the SQuiRT screening value and U.S. EPA residential PRG.

PCP and dioxin were detected in a background sample in an unindustrialized area eight miles south of the Site. At this location, the PCP sample slightly exceeded the SQuiRT screening value and the dioxin sample was less than both the SQuiRT screening value and the U.S. EPA residential PRG.

Sincerely,

Matt Hagemann
Project Manager

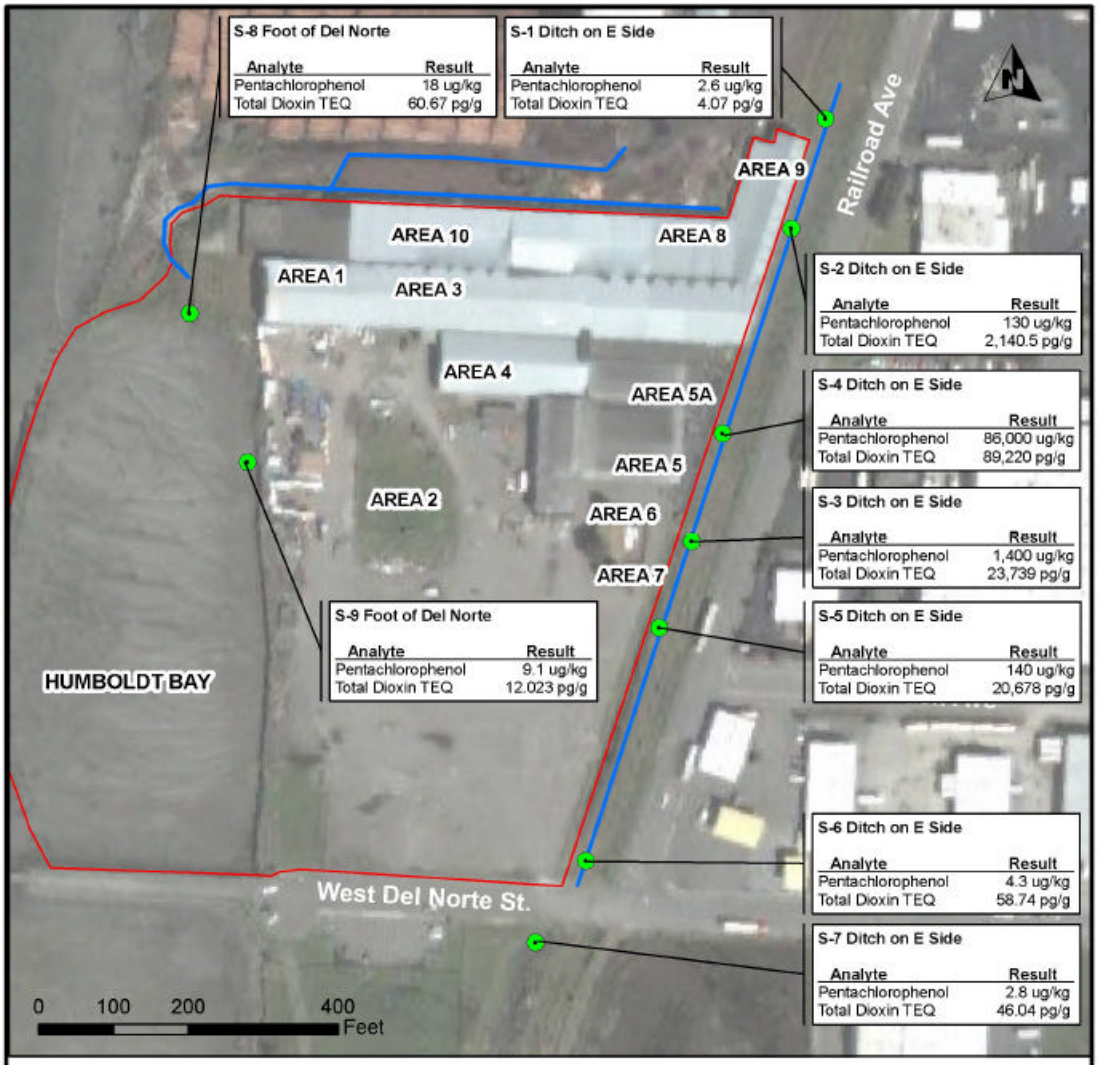
Rob C. Hesse, R.G., REA
Geologist

References

NOAA, 1999. Screening Quick Reference Tables (SQuiRTs), available online at http://response.restoration.noaa.gov/book_shelf/122_squirt_cards.pdf. National Oceanic and Atmospheric Administration. September 1999.

U.S. EPA, October 2004. Region 9 Preliminary Remediation Goals (PRG) Table, available online at http://www.epa.gov/region9/waste/sfund/prg/files/04prgtable.pdf.

U.S. EPA, 2006. Ecological Risk Assessment, Frequently Asked Questions, Screening Benchmarks, available online at http://epa.gov/reg3hwmd/risk/eco/faqs/screenbench.htm



Legend:

- Location of Sediment Sample
- Surface Water Drainage Ditch
- Site Boundary

Notes:

1. All locations are approximate.
2. Drainage lines and features based on: "Industrial Storm Water Pollution Prevention Plan and Monitoring and Reporting Plan," by LACO Associates, June 1, 2006.

Site: Simpson Redwood Company d.b.a. Simpson Timber Company
1200 West Del Norte Street,
Eureka, California

Title: **Concentrations of Pentachlorophenol and Total Dioxins TEQs in Samples of Sediment**

Drawn By:	Date:	Figure No.:
RCH	8/6/06	1

ATTACHMENT 1:

Sampling and Analysis Plan

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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April 16, 2006

Mr. Fred Evanson
Law Offices of Fredric Evanson
424 First Street
Eureka, CA 95501

Subject: Sediment Sampling and Analysis Plan, Former Simpson Plywood Plant, Eureka, CA

Dear Mr. Evanson:

We have prepared this sampling and analysis plan (SAP) to govern the collection of sediment in the vicinity of the former Simpson Plywood Plant (site) in Eureka, California (Figure 1). The sediment will be sampled for the presence of PCP and dioxin.

Samples will be collected on the eastern and western perimeters of the site, located at 1200 Del Norte Street in Eureka, CA. The objectives of the sampling are to:

- Determine if PCP and dioxin are present in the sediment;
- Compare analytic results to agency-established values to screen for impacts to ecologic receptors; and
- Compare analytic results to samples collected approximately 200 feet upstream of the site and to results from sediment collected at a reference point in the southern part of Humboldt Bay.

The sampling effort will be governed by this SAP which has been prepared with use of the following guidance:

- U.S. EPA, Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual EPA-823-B-01-002 October 2001 http://www.epa.gov/waterscience/cs/collection.html

- U.S. EPA, Superfund Program Representative Sampling Guidance, Volume 5 -- Water and Sediment, Part I - Surface Water and Sediment, Interim Final, OSWER Directive 9360.4-16, December 1995 (http://www.clu-in.org/download/char/SF_Rep_Samp_Guid_water.pdf)
- U.S. EPA, Compendium of ERT Surface Water and Sediment Sampling Procedures, January 1991, OSWER Directive 9360.4-03.

This SAP has been prepared following an extensive review of site documentation, provided by Humboldt BayKeeper and obtained from the North Coast Regional Water Quality Control Board (RWQCB). This SAP is based on an understanding of the site that we obtained from the review of the files and in the development of a site conceptual model. We presented the conceptual model and identified site assessment data gaps in a meeting with the Executive Director and staff of the RWQCB in January 2006.

The SAP is organized as follows:

Section 1 – Site Background
Section 2 – Conceptual Model and Sampling Strategy
Section 3 – Sampling Objectives and Locations
Section 4 – Sampling Methodology and Analytical Procedures

Section 1: Site Background

Site History

The former Simpson Plywood facility is located directly adjacent to Humboldt Bay at the foot of Del Norte St. in Eureka, California (Figure 1). Simpson Redwood Company purchased the property in 1956, merged with Simpson Timber Co. in 1963 and operated the plant as Eureka Plywood until it was shut down in 1968. Former operations at the site included the manufacturing of plywood from as early as the 1920's through the period of Simpson's occupancy. Previous investigations have been conducted to assess the presence and distribution of contaminants in the soil and groundwater throughout the site. Constituents of concern at the site are specific to certain areas, and include PCP, TCP, PNAs, formaldehyde, total petroleum hydrocarbons, and BTEX.

Site Description

The site is bordered to the west by Humboldt Bay and to the east by a tributary to Humboldt Bay and Eureka Marsh which has been channelized to convey runoff. This channel will be referred to as the East Ditch. Water in the East Ditch generally flows southward but changing tides cause flow reversal in the vicinity of the sampling locations.

Two water-bearing zones, the A-Zone and the B-Zone, have been identified beneath the site. The A-Zone is a perched aquifer found at depths of one to five feet and the upper

surface elevation is eight feet above mean sea level[1]. Aquifer materials of the A-Zone include fill of unknown origin that are characterized by fine grained to coarse grained sediments and debris.

The A-Zone overlies seven to eight feet of estuarine silt and clay termed "Bay Mud." The Bay Mud has is characterized by sand, silt, and clay, with marsh vegetation, shell fragments, wood fragments, and carbonaceous matter. The Unocal Bulk Terminal, located approximately 1,500 feet to the north, has areas beneath the site where the Bay Mud does not exist.

The B-Zone is a semi-confined aquifer found at 14 to 25 feet bgs. The aquifer material is sand. The RWQCB has concluded that the A-Zone and the B-Zone are hydraulically interconnected and are both tidally influenced.[2]

Several areas of the site have been identified in prior investigations that are related to past mill operations and associated PCP contamination. For the purposes of this SAP the areas that are potential PCP sources that border the selected sampling locations as shown in Figure 1 are described below from a 1997 report by a Simpson consultant[3] unless other wise noted.

> Area 1: Headworks Area - located at the North western portion of the site. Logs were received here for processing which included peeling, de-barking and steaming. In 1999, 120 cubic yards of soil was excavated from Area 1.[4] A 4,800 ft^2 asphalt cap was installed to prevent infiltration of contaminated soil.
>
> Areas 5 and 6: Woodlife Application Area - This area was located in the eastern portion of the former plywood building, adjacent to the East Ditch. Woodlife, which contains approximately 3% PCP and the remainder mineral spirits, was applied as a fine mist to the wood in a concrete room. A sump was used to collect Woodlife drippage for reuse. Woodlife was stored in a 10,000-gallon AST located just south of the spray booth at the southeast corner of the warehouse until 1963. After 1963, it was moved to the east side of the main office, and underground piping was run from the new location to the spray booth area. In 1997 this pipeline was removed, and soil samples were screened for contamination.

[1] Subsurface Investigation Report, Geomatrix, May 1999
[2] Letter from North Coast RWQCB to Preston Properties and Simpson Timber Company May 8, 2003
[3] Site History and Data Compilation Report, Geomatrix, December 1997 (97_12_site_Hist_data_compilation)
[4] SHN Consulting Engineers and Geologists, Supplemental Information for Simpson Timber Company's CDP Application, July 11, 2005. (05_7_CDP)

Separate phase Woodlife was found in the shallow subsurface in Areas 5, 6 and 8.[5] Areas 5 and 6 were addressed in an interim remedial action in the summer of 2003. Excavation of soil was conducted along approximately 400 linear feet of the area along the eastern edge of the former Plywood Building and Office Building. A clay barrier was installed along the south and east border of the former Plywood Building to "inhibit the migration of PCP in groundwater."[6]

Area 7: Underground Storage Tank - In 1991, a 1000 gallon UST was removed from the southeast corner of the former office building. Soil samples were colleted and no gasoline related contaminants were detected. Groundwater samples were collected and gasoline-related contaminants were found at "low levels."

Historical Analytical Results

PCP has been detected in soil and groundwater at the site. A February 2005 report documents PCP in soil in the Headworks area (Area 1) at 1.2 ug/g and in groundwater at 1.4 ug/L. PCP was detected in groundwater samples collected in February 2005 from beneath the foundation of the former Plywood Building at a maximum concentration of 3,100 ug/L.

PCP has also been detected in surface water adjacent to the site. The following table was copied from a September 2005 report and documents eight occurrences of TCP in the East Ditch (September 2005 Semiannual Groundwater Monitoring Report)

Table B-5
Drainage Ditch Samples Historical Analytical Results
Former Eureka Plywood, Eureka, California

Sample Location	Station ID	Sample Date	Condition of Ditch Water	TPHD[1]	TPHMS[1]	Detected PNAs[2]	TCP[2]	PCP[2]
Drainage Ditch Grab Sample (in mg/L)[3]								
Ditch-0301	DDS 3	March 13, 2001	Standing	<0.050[4]	<0.050	<0.0001	<0.001	**0.0009**
DD-US-0501	DDS 3	May 3, 2001	Standing	NA[5]	NA	<0.0001	<0.001	**0.0007**
DD-DS-0501	DDS 2	May 3, 2001	Standing	NA	NA	<0.0001	<0.001	**0.0008**
DD-01-0801	DDS 4	August 22, 2001	Standing	NA	NA	Fluoranthene: **0.0001** All Others: <0.0001	<0.001	<0.0003
DD-CI-1201	DDS 1	December 17, 2001	Flowing	NA	NA	<0.0001	<0.001	<0.0003
Ditch	DDS 1	February 8, 2002	Flowing	NA	NA	<0.0001	<0.001	**0.0005**
Ditch-1-0302	DDS 1	March 7, 2002	Flowing	<0.050	<0.050	<0.0001	<0.001	**0.0005**
OEPDS-1	DDS 1	January 13, 2003	Flowing	NA	NA	<0.0001	<0.001	**0.0003**
OEPW-DS 0203	DDS 1	February 13, 2003	Flowing	NA	NA	<0.0001	<0.001 / <0.001	**0.0007** / <0.003
OEPDS-1	DDS 1	March 13, 2003	Flowing	NA	NA	<0.01	NA	<0.05
OEPDS-1	DDS-1	February 17, 2004	Flowing	NA	NA	NA	<0.001	0.00034
OEPDS-1	DDS-1	February 9, 2005	Flowing	NA	NA	NA	<0.001	<0.0003

1. Total Petroleum Hydrocarbons quantified as Diesel-range (TPHD), and Mineral Spirits (TPHMS), analyzed in general accordance with U.S. Environmental Protection Agency (EPA) Method No. 8015B. Prior to analysis, the sample extract was passed through a silica gel column as described in EPA Method No. 3630
2. The groundwater sample was passed through a 0.7 micron glass filter prior to analysis. Polynuclear Aromatic Hydrocarbons (PNAs), Tetrachlorophenol (TCP), and Pentachlorophenol (PCP), analyzed in general accordance with EPA Method No. 8270 Selected Ion Monitoring (SIM).
3. mg/L: milligrams per liter
4. <: Denotes a value that is "less than" the laboratory method detection limit.
5. NA: Not Analyzed

[5] Revised Conceptual Remedial Action Plan, Geomatrix, March 2003 (Geo 2003_3.03 revised conceptual remedial action plan)

[6] SHN Consulting Engineers and Geologists, Data Evaluation for Areas 1, 5/6, and 7, Simpson Timber Company, August 2, 2005. (05_8_2_data eval areas 5_6_7)

Our review of Regional Water Quality Control Board Facility Violation Reports has shown three other occurrences where PCP was detected at concentrations up to 2.5 ppb but was not included in the table in the September 2005 report.[7]

Section 2: Conceptual Model and Sampling Strategy

Conceptual Model of Contaminant Transport, Exposure and Ecologic Risk

According to the Agency for Toxics Disease Registry (ATSDR), PCP is common in the environment and is found across the United States in surface water, sediments, and rainwater. In the environment, PCP tends to adsorb to soils, especially if the under acidic soil conditions (http://www.epa.gov/OGWDW/dwh/t-soc/pentachl.html). The amount of PCP adsorbed at a given pH increases with increasing organic content of the soil. PCP is more mobile in soil under neutral or alkaline conditions, and adsorption is minimal at pH values above 6.8. PCP is broken down by microorganisms in the soil and groundwater, and biodegradation is thought to be the major pathway of PCP degradation in the environment. PCP can also be degraded by sunlight.

Typically, commercial grade PCP was approximately 86% pure. Impurities included other polychlorinated phenols, polychlorinated dibenzo-p-dioxins, and polychlorinated dibenzofurans. Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (collectively referred to as dioxins) are the PCP impurities of most concern. The polychlorinated dibenzo-p-dioxins include 75 individual compounds, and the polychlorinated dibenzofurans include 135 individual compounds. These compounds are technically referred to as congeners.

One dioxin congener, 2,3,7,8, tetrachlorodibenzo-*p*-dioxin (TCDD), is thought to be the most toxic and has been studied extensively. Since TCDD and other dioxin-like compounds exist as complex mixtures of various congeners throughout the environment, calculating total TCDD toxic equivalent (TCDD-TEQ) concentrations has become widely accepted as the most relevant exposure measure in studies of health effects of dioxins and dioxin-like compounds.

Because PCP and dioxins tend to adsorb to soil to soil and sediment, we have concluded that a primary mechanism for offsite transport includes suspension of PCP- and dioxin-sorbed soil particles in surface water and groundwater flow. In ground water, dioxin may move when sorbed to colloidal particles, generally defined as smaller than one micrometer (1 um) in diameter. Colloidal particles are known to be mobilized by groundwater flow.

[7] See for example, Facility Violation Report, RWQCB, February 24, 2002.

Once transported offsite, the soil particles would settle and accumulate in sediment in low energy depositional environments such as the East Ditch and Humbolt Bay adjacent to the western boundary of the site, the areas we have targeted for sediment sampling.

Groundwater Transport

Groundwater in the A-Zone is reported to flow in southeasterly direction. A 1999 report (Geomatrix Subsurface Investigation Report, May 1999) noted higher elevation of the A-Zone aquifer near the southwest corner of former Plywood Building (Area 4) with elevations decreasing towards the southeast. A groundwater flow map for the A-Zone, prepared in 2003, is consistent with the 1999 report and depicts groundwater flowing southeast toward the ditch.

Groundwater elevations indicate a potential for intercommunication with Humboldt Bay and the East Ditch. The 1999 report noted ditch water levels at lower elevations than groundwater in the A-Zone, indicating the ditch is seasonally fed by groundwater.

During a SWAPE visit in January 2006, water was observed to discharge along the bulkhead of the western perimeter of the site and into Humboldt Bay. This observation was made during a minus tide where seepage was occurring in areas between boards used in the bulkhead, in cracks, and at the base of riprap where the fence was not intact. We have interpreted this discharge to be from a groundwater source, most likely the A-Zone given the elevation of the discharge observed at about 6 feet below ground surface. Alternatively, the discharge may be drainage from remnant surface water, trapped at high tide.

Pure PCP is practically insoluble in groundwater; however, PCP does dissolve into hydrocarbons such as the mineral spirits which were used as the carrier oil in Woodlife, the product used for wood treatment at the site. Because PCP was dissolved in mineral spirits, it may partition from the Woodlife to soil and to groundwater, consistent with historical analytical results for samples collected at the site. Therefore, in addition to colloidal transport, dissolved phase transport of PCP and associated dioxins is also a likely mechanism for movement of contaminants offsite.

Surface Water Transport

Surface water that flows offsite during storm events has the potential to transport sediment and colloids with adsorbed PCP and dioxin contaminants. A Preston Properties consultant observed stormwater at four areas onsite (need ref):

- Railroad Street drainage
- Asphalt parking lot
- Open ditch along north side of site; and
- Combined stormwater discharge from Headworks to the Bay.

Screening Levels for Ecologic Risk

Sample results will be compared to National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs: (http://response.restoration.noaa.gov/book_shelf/122_squirt_cards.pdf). NOAA describes SQuiRTs as useful for identifying substances "which may threaten resources of concern to NOAA."

The NOAA SQuiRTs for PCP and dioxin in marine sediment in ug/kg (ppb) dry weight are as follows:

- PCP – 17 ug/kg (ppb) dry weight
- Dioxin (TCDD-TEQ) – 0.0036 ug/kg (ppb) dry weight.

Section 3: Sampling Objectives and Locations

Sampling Objectives

The objectives of the sampling are to:

- Determine if PCP and dioxin are present in the sediment;
- Compare sample results to agency-established ecologic risk screening levels
- Compare results to samples collected 200 feet upstream and to results from sediment collected at a reference point in the southern part of Humboldt Bay.

Sampling Locations

We have selected two primary sampling areas on the perimeter of the site (Figure 1). One site is along the western perimeter adjacent to the Bay and next to the former Headworks area of the site where PCP has been recently detected in soil and groundwater (Area 1, see Figure 2). The specific sites have been chosen based on observations made during a preliminary site walk. In order from west to east they include:

- The former log receiving area (narrow inlet);
- Area of noted water discharge from clay pipe in bulkhead; and
- Area of noted water discharge from rip rap.

The second site is along the axis of the East Ditch from an area north (generally upstream) of the site to the south of Del Norte Street. A total of six samples will be collected from the East Ditch area (Figure 2). In order from the northern-most sampling location to the southern-most sampling location these include:

- North of Area 9, 200 feet north of the northeast corner of the site;
- Just south of Area 9;
- Adjacent to Area 5A;

- Just south of Area 5 and 6 ;
- At the north side of Del Norte Street; and
- At the south side of Del Norte Street.

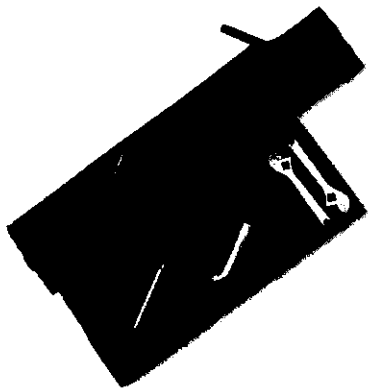
Additionally, a sediment sample will be collected from a reference point in the southern part of Humboldt Bay

Section 4: Sampling Methodology and Analytical Procedures

Sampling Methodology

The sampling will be performed in general accordance with the U.S. EPA protocol for sediment sampling as previously referenced. All samples will be collected on the same day. Prior to collecting the sample, a portable monitoring instrument will be used to measure field parameters of pore water in the sediment including: pH, specific conductivity, temperature, salinity, and dissolved oxygen

A stainless steel hand core sediment sampler (AMS Core Sampling Mini Kit) will be used to collect the samples as shown below.



The sampler will be pushed into the sediment which is soft and easily penetrated by hand. Sediment samples will be extracted by removing a stainless steel sleeve from the core barrel and pushing the required sample volume into the sample jars.

Other sampling equipment to be used is as follows:

- Field parameter meter (YSI 556 MPS) for measuring pH, specific conductivity, and temperature
- Stainless steel spoons, trowels and spatulas
- Glass jars
- Stainless steel mixing bowls
- Ice chest
- Ice

- Sample labels
- Plastic sealable bags
- Protective clothing (i.e. gloves, rubber boots). (Please note that a health and safety plan was not prepared for this sampling effort because all sampling will be conducted outside of the perimeter of the site in areas accessible to the public.)

In accordance with U.S. EPA protocol, samples will be homogenized (mixed) in the field. Homogenizing is the mixing or blending of sample material to distribute contaminants uniformly within the sample. Ideally, proper homogenizing ensures that all portions of the sample are equal or identical in composition and are representative of the total sample collected. To homogenize the sample, the required amount for lab analysis will be obtained with the hand corer. The sediment will be emptied into stainless steel bowls and mixed with a spatula. The blended sediment will then be packed into the sample jars for shipment.

East Ditch Sample Collection

Given the sampling will be conducted in early spring, we anticipate that water will be flowing through the ditch during sample collection. Sampling will proceed from downstream to upstream locations to minimize disturbance. Surface water in the ditch at the sampling locations may be subject to tidal influences. The direction of the current will be noted and recorded on field logs when sampling is conducted to ensure sampling proceeds from downstream to upstream. Care will be taken to minimize disturbance and sample washing as the sediment is retrieved through the water column. Fine fractions lost during sample collection can result in a non-representative sample.

The layer of sediment that is biologically active will be collected for comparison to concentrations that are protective of ecologic risk. Therefore, the presence of biologic activity in the sediment will be noted and logged on the field forms.

We anticipate biologically active sediment horizon to be found from 0-15 cm in depth; accordingly, sediment will be collected from this horizon. Field homogenization of the sediment will uniformly mix contaminants in that horizon prior to shipment to the lab for analysis.

Western Perimeter Sample Collection

Three sediment samples will be collected from sediment at the base of the western perimeter of the site. Samples will be collected during a low tide; therefore the use of the hand corer may not be necessary and may instead be collected with a stainless steel spatula to a depth of 15 cm. Homogenization of the samples will be conducted in the field.

Field Conditions

The following observations and conditions in the field will be recorded during sample collection:

- Project title, time and date of collection, sample number, site identification (e.g., name); station number and location (e.g., positioning information);
- Water depth, current direction and the sampling penetration depth;
- Details pertaining to unusual events which might have occurred during the operation of the sampler (e.g., possible sample contamination, equipment failure, unusual appearance of sediment integrity, control of vertical descent of the sampler, etc.), preservation and storage method, analysis or test to be preformed;
- Estimate of quantity of sediment recovered by a grab sampler, or length and appearance of recovered cores;
- Description of the sediment including texture and consistency, color, presence of biota or debris, presence of oily sheen, changes in sediment characteristics with depth,
- pH, specific conductivity, and temperature of the sediment pore water and overlying water
- Photograph of the sample core material;
- Deviations from the SAP..

Decontamination

Decontamination between sampling locations will be conducted as follows:

1. Washing in Liquinox detergent and bottled water;
2. Rinsing with bottled water;
3. Rinsing with deionized water;
4. Rinsing with pesticide-grade acetone;
5. Rinsing with pesticide grade hexane;
6. Air drying; and
7. Wrapping in aluminum foil until use.

Latex gloves will be worn during sampling and will be disposed prior to sampling each location.

Sample Analysis

PCP

U.S. EPA Method 8151 Modified (http://www.epa.gov/sw-846/pdfs/8151a.pdf) will be used to analyze chlorinated compounds including pentachlorophenol in sediment. This method uses gas chromatography to conduct the analysis. The estimated detection limit

for PCP with use of Method 8151 in sediment is 0.16 ug/kg. The minimum required amount of sample material for analysis is 30 gm. The holding time is 14 days when stored in the dark at 4° C.

Dioxin

U.S. EPA Method 8290 (http://www.epa.gov/sw-846/pdfs/8290.pdf) will be used to analyze polychlorinated dibenzodioxins in sediment. According to U.S. EPA, use of Method 8290 is appropriate for the analysis of sediment, as well as other media including water, sludge and fish tissue.

The method uses a high resolution gas chromatography- high resolution mass spectrometry to measure into the low part-per-trillion range for solid and semi-solid materials. EPA Method 8290 includes analysis of all 17 tetra- through octa- congeners. Detection limits for each congener will be achieved by the laboratory to ensure comparison to applicable ecologic risk screening levels and calculation of TCDD-TEQ.

The holding time is 30 days when samples are stored in the dark at 4° C. The lab requires a mass of solid or semi-solid sample material of approximately 20 grams.

Sample Handling and Documentation

Sample collection will be documented on field forms that will include the following information:

- Name of personnel collecting the samples;
- Date and time of sample collection;
- Depth interval;
- Sketch of sampling area with photographs;
- Ambient weather conditions, including wind speed and direction, current, tide, air and water temperature;
- Type of sediment collection device and any modifications made during sampling;
- Sediment description including lithology and presence of marine organisms; and
- Hand-held instrument data (pH, specific conductivity, and temperature).

For shipment, samples will be labeled, logged, and will include appropriate chain-of-custody documentation. Samples will be placed in coolers to be maintained at 4°C. Samples will be delivered to laboratories within 48 hrs, well within maximum holding times. All containers will be packaged to prevent breakage or leakage though use of material that includes bubble wrap and ice.

Sincerely,

Matt Hagemann

Rob Hesse, California Registered Geologist

Figure 1

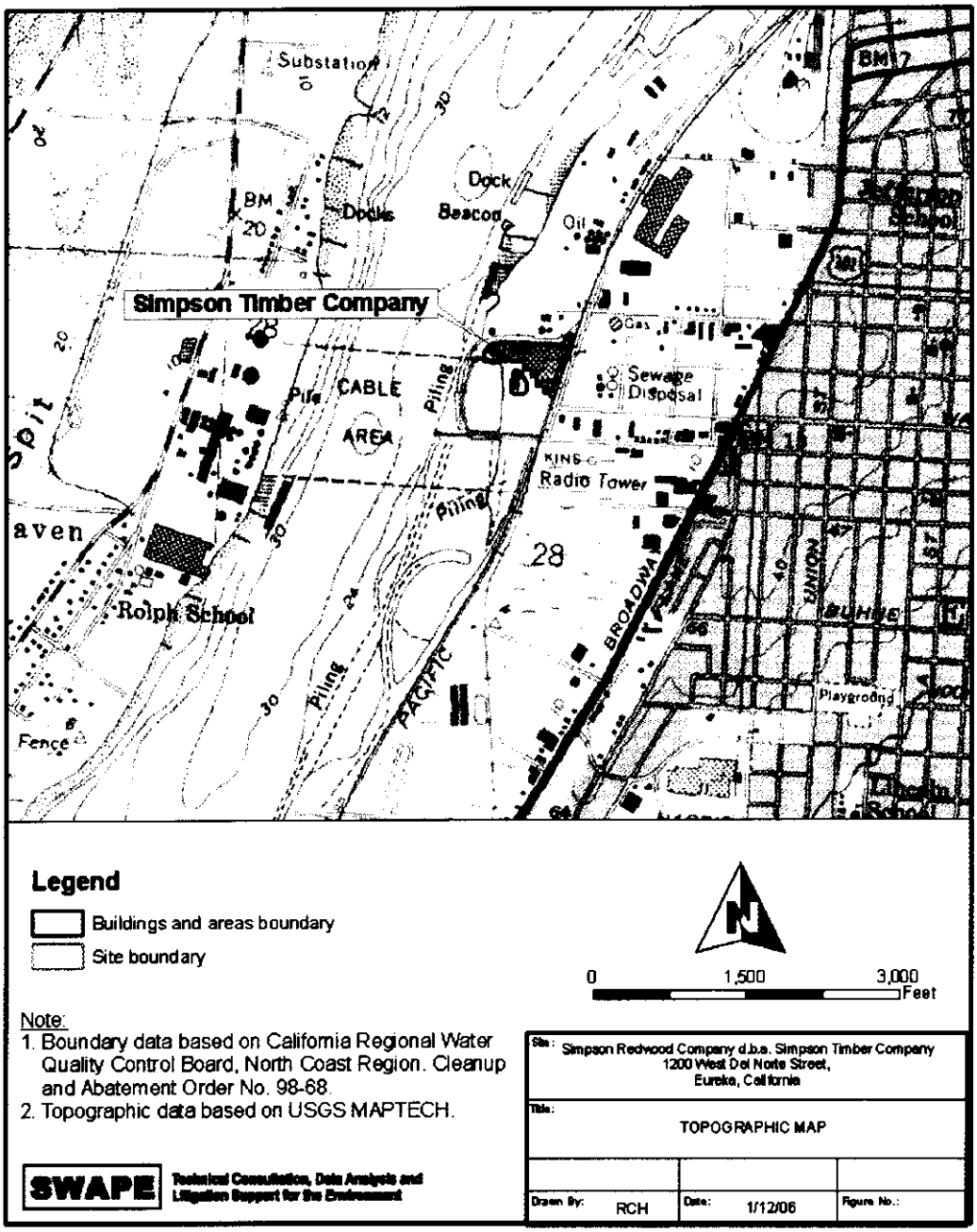
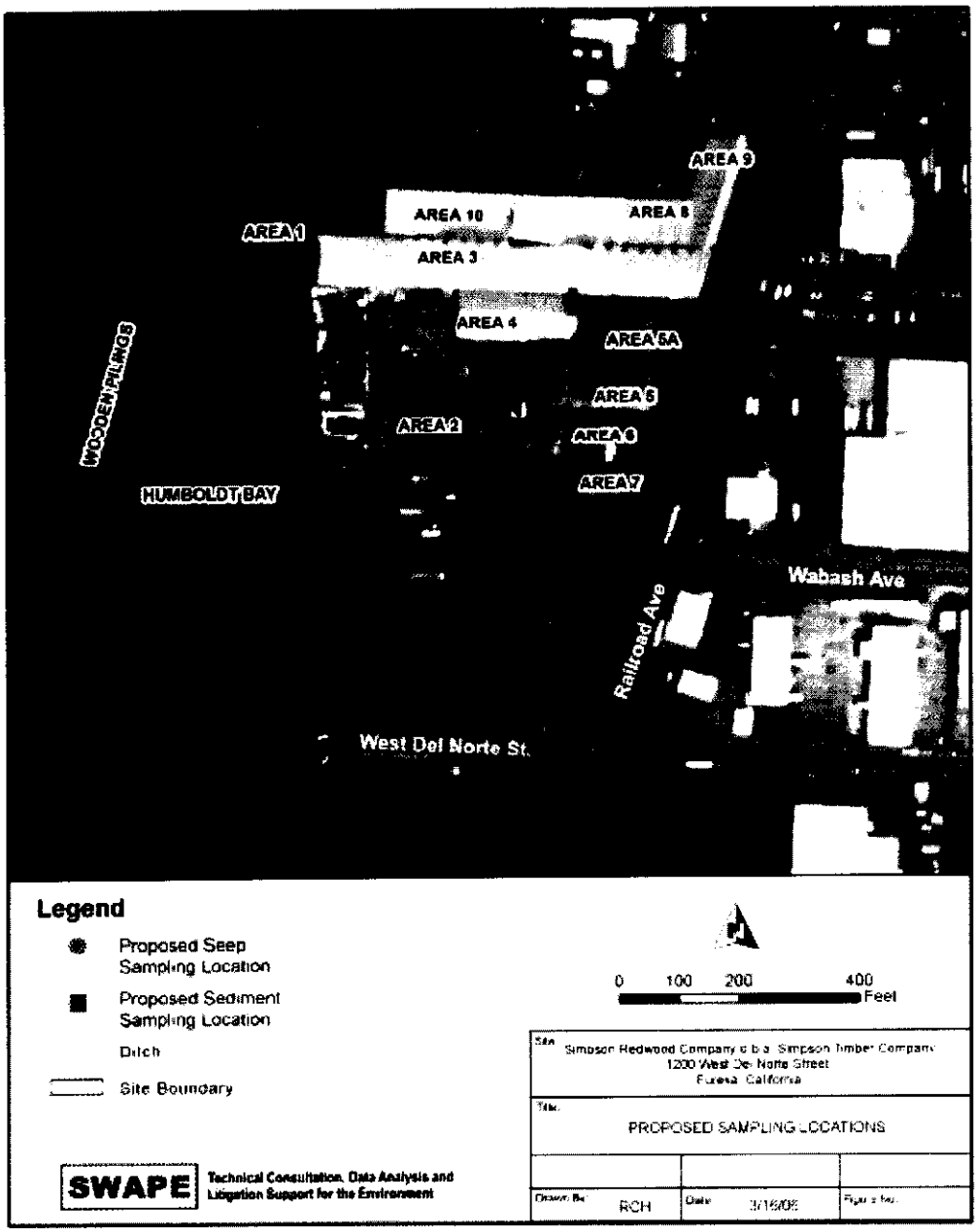

Substation
BM
Dock
Beacon
Oil
Simpson Timber Company
Pipe
CABLE
AREA
Piling
Sewage Disposal
Radio Tower
28
Ralph School
BROADWAY
Playground
Fence
Legend
Buildings and areas boundary
Site boundary
0
1,500
3,000
Feet
Note:
1. Boundary data based on California Regional Water Quality Control Board, North Coast Region. Cleanup and Abatement Order No. 98-68.
2. Topographic data based on USGS MAPTECH.
SWAPE
Technical Consultation, Data Analysis and Litigation Support for the Environment
Site: Simpson Redwood Company d.b.a. Simpson Timber Company
1200 West Del Norte Street,
Eureka, California
Title:
TOPOGRAPHIC MAP
Drawn By: RCH
Date: 1/12/06
Figure No.:

Figure 2


AREA 9
AREA 10
AREA 8
AREA 1
AREA 3
AREA 4
AREA 5A
SOUTH BAY CANAL
AREA 5
AREA 2
AREA 6
AREA 7
HUMBOLDT BAY
Wabash Ave
Railroad Ave
West Del Norte St.
Legend
Proposed Seep Sampling Location
Proposed Sediment Sampling Location
Ditch
Site Boundary
0 100 200 400
Feet
Site
Simpson Redwood Company d.b.a. Simpson Timber Company
1200 West Del Norte Street
Eureka, California
Title
PROPOSED SAMPLING LOCATIONS
Drawn By
RCH
Date
3/16/08
SWAPE
Technical Consultation, Data Analysis and Litigation Support for the Environment

Field Form

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: _____
Project No.: _____

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: _____
Sample Location: _____
Sampled By: _____
C.O.C. No.: _____

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time / Method: / Monitor Reading (ppm):	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: / Method: / Monitor Readings (Range in ppm):	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

ATTACHMENT 2:

Laboratory Analytical Report and Chain of Custody

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

May 23, 2006

STL SACRAMENTO PROJECT NUMBER: G6D190216
PO/CONTRACT:

Paul Rosenfeld
Soil Water Air Protection Enterprise
201 Wilshire Ave, Second Floor
Santa Monica, CA 90401

Dear Mr. Rosenfeld,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on April 19, 2006. These samples are associated with your SIMPSON PLYWOOD project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G6D190216

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G6D190216

General Comment

The sampling time for sample S-1 was listed as 3:30 on the label and as 3:13 on the chain of custody (COC). The sampling time for sample S-10 was listed as 1:30 on the label and as 1:35 on the COC. The sampling date for sample S-8 was listed as 4/17/06 on the label and as 4/18/06 on the COC.

SOLID, 8290, Dioxins/Furans

Sample(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Most samples demonstrate significant high levels of dioxins and furans that caused detector saturation in the undiluted injections. Due to the very high native levels in some of these samples, the ion ratios of internal standards and/or internal standard recoveries fall outside control limits.

For any analyte with ion ratios outside limits, the quantitation was based on a theoretical area count for the ion peak in question. The results were qualified as "positively identified, but estimated quantitaty" because the quantitation is based on theoretical ratios.

Sample(s): 2, 3, 4, 5, 6, 7, 8, 9
Several compounds in the above samples were reported with an "E" flag as the result exceeded the upper calibration limit (UCL) without detector saturation. Historical data indicates that for the isotope dilution method, dilution and reinjection will not produce significantly different results from those reported with the "E" qualifier.

Sample(s): 2, 3, 4, 5
The above samples were diluted in an effort to eliminate detector saturation. This was achieved for all samples except sample 4. The saturated value for 1,2,3,4,6,7,8-HpCDD in sample 4 was reported as is, as the value exceeded the client's action level. Also, isomer 1,2,3,4,7,8-HxCDD, in sample 4 was reported from the undiluted analysis as the daily standard associated with the dilutions had a low bias for this compound.

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G6D190216

SOLID, 8290, Dioxins/Furans (Cont.)
Sample(s): 2, 3, 4, 5
The above samples were analyzed at a dilution on May 11, 2006.

Sample(s): 2, 3, 4, 5, 8
The above samples were analyzed for 2,3,7,8-TCDF on the confirmation column on May 8, 2006.

Sample(s): 6, 7, 9
The above samples were analyzed for 2,3,7,8-TCDF on the confirmation column on May 10, 2006.

There were no other anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona*	AZ0616	Pennsylvania*	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas*	T104704231-TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut*	PH 0691	Virginia*	00178
Florida*	E87570	Washington	C087
Georgia*	960	West Virginia*	9930C 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada*	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G6D190216

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
H3KXA	1	S-1 DITCH ON E. SIDE	4/17/2006 03:15 PM	4/19/2006 09:15 AM
H3KXK	2	S-2 DITCH ON E. SIDE	4/17/2006 03:50 PM	4/19/2006 09:15 AM
H3KXN	3	S-3 DITCH ON E. SIDE	4/17/2006 04:20 PM	4/19/2006 09:15 AM
H3KXP	4	S-4 DITCH ON E. SIDE	4/17/2006 04:45 PM	4/19/2006 09:15 AM
H3KXQ	5	S-5 DITCH ON E. SIDE	4/17/2006 05:30 PM	4/19/2006 09:15 AM
H3KXR	6	S-6 DITCH ON E. SIDE	4/17/2006 05:50 PM	4/19/2006 09:15 AM
H3KXX	7	S-7 DITCH ON E. SIDE	4/17/2006 06:05 PM	4/19/2006 09:15 AM
H3KX0	8	S-8 FOOT OF DEL NORTE	4/18/2006 11:55 AM	4/19/2006 09:15 AM
H3KX2	9	S-9 FOOT OF DEL NORTE	4/18/2006 12:30 PM	4/19/2006 09:15 AM
H3KX3	10	S-10 HOOKSTON SLOUGH	4/18/2006 01:35 PM	4/19/2006 09:15 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G6D190216

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client	Project Manager	Date	Chain of Custody Number
Michelle Smith Humboldt Baykeeper	Matt Hagemann	4/17/06	146012
Address 424 First Street	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
City Eureka **State** CA **Zip Code** 95501	**Site Contact**	**Lab Contact**	**Analysis (Attach list if more space is needed)**
Project Name and Location (State) Simpson Plywood	**Carrier/Waybill Number**		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	PCP EPA 515.1	Dioxin EPA 8290	TOC	Special Instructions/ Conditions of Receipt
S-1 Ditch on E. Side	4/17/06	3:15			X								X	X	X	
S-2 "		3:50														
S-3 "		4:20														
S-4 "		4:45														
S-5 "		5:30														
S-6 "		5:50														
S-7 "	✓	6:05														
S-8 Foot of Del Norte	4/18/06	11:55														
S-9 "		12:30														
S-10 Hookton Slough	✓	1:35			✓								✓	✓	✓	

RECEIVED IN GOOD CONDITION UNDER COC
APR 19 2006
INT:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☒ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By			1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By	4/18/06	3:15 PM	3. Received By	4/19/06	1110

Comments PCP = Pentachlorophenol # Rec'd labeled @ 3:30

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

- Rec'd Labeled on 4/17/06. 1 - Rec'd Labeled @ 1:30. @ 4/19/06

STL Sacramento (916) 373 - 5600

5 of 66

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Humboldt Baykeeper PM VXL LOG # 38342

LOT# (QUANTIMS ID) G6D190216 QUOTE# 70013 LOCATION W3A

		Initials	Date
DATE RECEIVED 4/19/06 TIME RECEIVED 0915		AW	4/19/06
DELIVERED BY	☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT		
	☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL		
	☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS		
	☐ STL COURIER ☐ COURIERS ON DEMAND		
	☐ OTHER		
CUSTODY SEAL STATUS	☑ INTACT ☐ BROKEN ☐ N/A		
CUSTODY SEAL #(S) 411123			
SHIPPPING CONTAINER(S)	☑ STL ☐ CLIENT ☐ N/A		
TEMPERTURE RECORD (IN °C)	IR 1☐ 3☑ ☐ OTHER		
COC #(S) 146012			
TEMPERATURE BLANK	Observed: NA Corrected:		
SAMPLE TEMPERATURE Observed: 5 6 5	Average: 5 Corrected Average: 5		
COLLECTOR'S NAME:	☐ Verified from COC ☑ Not on COC		
pH MEASURED	☐ YES ☐ ANOMALY ☑ N/A		
LABELED BY			
LABELS CHECKED BY			
PEER REVIEW	☑ NA		
SHORT HOLD TEST NOTIFICATION	SAMPLE RECEIVING		
	WETCHEM ☑ N/A		
	VOA-ENCORES ☑ N/A		
☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL	☑ N/A		
☐ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES	☑ N/A		
☑ Clouseau	☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☐ N/A		
☐ WET ICE	☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED	☑ PM NOTIFIED	

Notes: Rec'd S-1 Labeled @ 3:30 - COC List @ 3:15
Rec'd S-8 w/ collection date on 4/17/06 - COC List on 4/18/06
Rec'd S-10 Labeled @ 1:30, COC List @ 1:35

*1 Acceptable temperature range for State of Wisconsin samples is ≤4°C.

SEVERN TRENT STL

Bottle Lot Inventory

Lot ID: G6D190216

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOA*																				
VOAh*																				
AGB																				
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
___AGJ																				
500AGJ																				
250AGJ																				
125AGJ																				
___CGJ																				
500CGJ																				
250CGJ																				
125CGJ	(																			
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
_____"CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

h = hydrochloric acid **s** = sulfuric acid **na** = sodium hydroxide **n** = nitric acid **zn** = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

QA-185 5/05 EM

Page 3

SOLID, 8290, Dioxins/Furans

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-1 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 001	**Work Order #...:**	H3KXA1AC	**Matrix....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	1D5
Prep Date.....:	05/02/06	**Analysis Date..:**	05/04/06	**Units.....:**	pg/g
Prep Batch #...:	6122320	**Dilution Factor:**	1	**% Moisture:**	20

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**0.58**	**J**		**1.000**	**0.5800**
Total TCDD	**3.4**				
1,2,3,7,8-PeCDD	ND		1.4	0.500	0
Total PeCDD	ND		1.4		0
1,2,3,4,7,8-HxCDD	ND		1.7	0.100	0
1,2,3,6,7,8-HxCDD	**5.4**			**0.100**	**0.5400**
1,2,3,7,8,9-HxCDD	**2.7**	**J**		**0.100**	**0.2700**
Total HxCDD	**29**				
1,2,3,4,6,7,8-HpCDD	**120**			**0.010**	**1.2000**
Total HpCDD	**230**				
OCDD	**980**			**0.001**	**0.9800**
2,3,7,8-TCDF	ND		0.23	0.100	0
Total TCDF	ND		0.26		0
1,2,3,7,8-PeCDF	ND		0.34	0.050	0
2,3,4,7,8-PeCDF	ND		0.40	0.500	0
Total PeCDF	ND		1.5		0
1,2,3,4,7,8-HxCDF	ND		1.7	0.100	0
1,2,3,6,7,8-HxCDF	ND		1.2	0.100	0
2,3,4,6,7,8-HxCDF	ND		1.1	0.100	0
1,2,3,7,8,9-HxCDF	ND		0.57	0.100	0
Total HxCDF	**32**				
1,2,3,4,6,7,8-HpCDF	**39**			**0.010**	**0.3900**
1,2,3,4,7,8,9-HpCDF	ND		1.7	0.010	0
Total HpCDF	**120**				
OCDF	**110**			**0.001**	**0.1100**
Total TEQ Concentration					**4.0700**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	70	40 - 135
13C-1,2,3,7,8-PeCDD	80	40 - 135
13C-1,2,3,6,7,8-HxCDD	78	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	79	40 - 135
13C-OCDD	73	40 - 135
13C-2,3,7,8-TCDF	75	40 - 135
13C-1,2,3,7,8-PeCDF	85	40 - 135
13C-1,2,3,4,7,8-HxCDF	74	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	84	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

J Estimated result. Result is less than the reporting limit.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-2 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 002	**Work Order #...:**	H3KXK1AC	**Matrix.....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	1D5
Prep Date.....:	05/02/06	**Analysis Date..:**	05/04/06	**Units.....:**	pg/g
Prep Batch #...:	6122320	**Dilution Factor:**	1	**% Moisture:**	69

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**28**			**1.000**	**28.0000**
Total TCDD	**650**				
1,2,3,7,8-PeCDD	**110**			**0.500**	**55.0000**
Total PeCDD	**1300**				
1,2,3,4,7,8-HxCDD	**310**			**0.100**	**31.0000**
1,2,3,6,7,8-HxCDD	**2500**			**0.100**	**250.0000**
1,2,3,7,8,9-HxCDD	**840**			**0.100**	**84.0000**
Total HxCDD	**13000**				
1,2,3,4,6,7,8-HpCDD	**60000**	**D**		**0.010**	**600.0000**
Total HpCDD	**100000**				
OCDD	**350000**	**D E**		**0.001**	**350.0000**
2,3,7,8-TCDF	**55**	**CON**		**0.100**	**5.5000**
Total TCDF	**510**				
1,2,3,7,8-PeCDF	**210**			**0.050**	**10.0000**
2,3,4,7,8-PeCDF	**150**			**0.500**	**75.0000**
Total PeCDF	**2400**				
1,2,3,4,7,8-HxCDF	**1200**			**0.100**	**120.0000**
1,2,3,6,7,8-HxCDF	**1600**			**0.100**	**160.0000**
2,3,4,6,7,8-HxCDF	**690**			**0.100**	**69.0000**
1,2,3,7,8,9-HxCDF	**40**			**0.100**	**4.0000**
Total HxCDF	**31000**				
1,2,3,4,6,7,8-HpCDF	**27000**	**E**		**0.010**	**270.0000**
1,2,3,4,7,8,9-HpCDF	**1000**			**0.010**	**10.0000**
Total HpCDF	**55000**				
OCDF	**19000**	**D**		**0.001**	**19.0000**
Total TEQ Concentration					**2140.5000**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	77	40 - 135
13C-1,2,3,7,8-PeCDD	79	40 - 135
13C-1,2,3,6,7,8-HxCDD	78	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	74	40 - 135
13C-OCDD	108	40 - 135
13C-2,3,7,8-TCDF	77	40 - 135
13C-1,2,3,7,8-PeCDF	81	40 - 135
13C-1,2,3,4,7,8-HxCDF	79	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	81	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
D	Result was obtained from the analysis of a dilution.
E	Estimated result. Result concentration exceeds the calibration range.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-3 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 003	**Work Order #...:**	H3KXN1AC	**Matrix....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	1D5
Prep Date.....:	05/02/06	**Analysis Date..:**	05/05/06	**Units.....:**	pg/g
Prep Batch #...:	6122320	**Dilution Factor:**	1	**% Moisture:**	92

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**160**			**1.000**	**160.0000**
Total TCDD	**3100**				
1,2,3,7,8-PeCDD	**3200**			**0.500**	**1600.0000**
Total PeCDD	**23000**				
1,2,3,4,7,8-HxCDD	**8800**			**0.100**	**880.0000**
1,2,3,6,7,8-HxCDD	**33000**	**E**		**0.100**	**3300.0000**
1,2,3,7,8,9-HxCDD	**22000**	**E**		**0.100**	**2200.0000**
Total HxCDD	**230000**				
1,2,3,4,6,7,8-HpCDD	**770000**	**D E**		**0.010**	**7700.0000**
Total HpCDD	**1300000**				
OCDD	**3200000**	**D E**		**0.001**	**3200.0000**
2,3,7,8-TCDF	**270**	**CON**		**0.100**	**27.0000**
Total TCDF	**3100**				
1,2,3,7,8-PeCDF	**940**			**0.050**	**47.0000**
2,3,4,7,8-PeCDF	**810**			**0.500**	**400.0000**
Total PeCDF	**18000**				
1,2,3,4,7,8-HxCDF	**5900**			**0.100**	**590.0000**
1,2,3,6,7,8-HxCDF	**7700**			**0.100**	**770.0000**
2,3,4,6,7,8-HxCDF	**5500**			**0.100**	**550.0000**
1,2,3,7,8,9-HxCDF	**200**			**0.100**	**20.0000**
Total HxCDF	**180000**				
1,2,3,4,6,7,8-HpCDF	**200000**	**D**		**0.010**	**2000.0000**
1,2,3,4,7,8,9-HpCDF	**9500**	**D**		**0.010**	**95.0000**
Total HpCDF	**520000**				
OCDF	**200000**	**D**		**0.001**	**200.0000**
Total TEQ Concentration					**23739.0000**

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C-2,3,7,8-TCDD	81		40 - 135
13C-1,2,3,7,8-PeCDD	83		40 - 135
13C-1,2,3,6,7,8-HxCDD	75		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	88		40 - 135
13C-OCDD	199	*	40 - 135
13C-2,3,7,8-TCDF	82		40 - 135
13C-1,2,3,7,8-PeCDF	85		40 - 135
13C-1,2,3,4,7,8-HxCDF	74		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	71		40 - 135

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-3 DITCH ON E. SIDE

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

*	Surrogate recovery is outside stated control limits.
CON	Confirmation analysis.
D	Result was obtained from the analysis of a dilution.
E	Estimated result. Result concentration exceeds the calibration range.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-4 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 004	Work Order #...:	H3KXP1AC	Matrix....:	SOLID
Date Sampled...:	04/17/06	Date Received..:	04/19/06	Instrument:	1D5
Prep Date.....:	05/02/06	Analysis Date..:	05/05/06	Units.....:	pg/g
Prep Batch #...:	6122320	Dilution Factor:	1	% Moisture:	70

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	160			1.000	160.0000
Total TCDD	6300				
1,2,3,7,8-PeCDD	5000	E		0.500	2500.0000
Total PeCDD	87000				
1,2,3,4,7,8-HxCDD	24000	E		0.100	2400.0000
1,2,3,6,7,8-HxCDD	270000	D		0.100	27000.0000
1,2,3,7,8,9-HxCDD	76000	D		0.100	7600.0000
Total HxCDD	2200000				
1,2,3,4,6,7,8-HpCDD	930000	D E		0.010	9300.0000
Total HpCDD	1600000				
OCDD	2400000	E D		0.001	2400.0000
2,3,7,8-TCDF	7200	E CON		0.100	720.0000
Total TCDF	15000				
1,2,3,7,8-PeCDF	27000	E		0.050	1400.0000
2,3,4,7,8-PeCDF	20000	E		0.500	10000.0000
Total PeCDF	140000				
1,2,3,4,7,8-HxCDF	70000	D		0.100	7000.0000
1,2,3,6,7,8-HxCDF	55000	D		0.100	5500.0000
2,3,4,6,7,8-HxCDF	35000	D		0.100	3500.0000
1,2,3,7,8,9-HxCDF	7800	D		0.100	780.0000
Total HxCDF	1900000				
1,2,3,4,6,7,8-HpCDF	720000	D E		0.010	7200.0000
1,2,3,4,7,8,9-HpCDF	66000	D		0.010	660.0000
Total HpCDF	2900000				
OCDF	1100000	D E		0.001	1100.0000
Total TEQ Concentration					89220.0000

INTERNAL STANDARDS	PERCENT RECOVERY		RECOVERY LIMITS
13C-2,3,7,8-TCDD	74		40 - 135
13C-1,2,3,7,8-PeCDD	80		40 - 135
13C-1,2,3,6,7,8-HxCDD	61		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	414	*	40 - 135
13C-OCDD	100		40 - 135
13C-2,3,7,8-TCDF	62		40 - 135
13C-1,2,3,7,8-PeCDF	73		40 - 135
13C-1,2,3,4,7,8-HxCDF	41		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	70		40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

*	Surrogate recovery is outside stated control limits.
CON	Confirmation analysis.
D	Result was obtained from the analysis of a dilution.
E	Estimated result. Result concentration exceeds the calibration range.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-5 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 005	**Work Order #...:**	H3KXQ1AC	**Matrix....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	1D5
Prep Date.....:	05/02/06	**Analysis Date..:**	05/05/06	**Units.....:**	pg/g
Prep Batch #...:	6122320	**Dilution Factor:**	1	**% Moisture:**	86

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**190**			**1.000**	**190.0000**
Total TCDD	**2800**				
1,2,3,7,8-PeCDD	**3900**			**0.500**	**2000.0000**
Total PeCDD	**21000**				
1,2,3,4,7,8-HxCDD	**9300**	**E**		**0.100**	**930.0000**
1,2,3,6,7,8-HxCDD	**28000**	**E**		**0.100**	**2800.0000**
1,2,3,7,8,9-HxCDD	**26000**	**E**		**0.100**	**2600.0000**
Total HxCDD	**230000**				
1,2,3,4,6,7,8-HpCDD	**600000**	**D E**		**0.010**	**6000.0000**
Total HpCDD	**1100000**				
OCDD	**2100000**	**D E**		**0.001**	**2100.0000**
2,3,7,8-TCDF	**250**	**CON**		**0.100**	**25.0000**
Total TCDF	**3900**				
1,2,3,7,8-PeCDF	**800**			**0.050**	**40.0000**
2,3,4,7,8-PeCDF	**720**			**0.500**	**360.0000**
Total PeCDF	**18000**				
1,2,3,4,7,8-HxCDF	**4900**			**0.100**	**490.0000**
1,2,3,6,7,8-HxCDF	**8100**	**E**		**0.100**	**810.0000**
2,3,4,6,7,8-HxCDF	**6600**			**0.100**	**660.0000**
1,2,3,7,8,9-HxCDF	**160**			**0.100**	**16.0000**
Total HxCDF	**150000**				
1,2,3,4,6,7,8-HpCDF	**140000**	**D E**		**0.010**	**1400.0000**
1,2,3,4,7,8,9-HpCDF	**6700**	**D**		**0.010**	**67.0000**
Total HpCDF	**340000**				
OCDF	**190000**	**D**		**0.001**	**190.0000**
Total TEQ Concentration					**20678.0000**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	76	40 - 135
13C-1,2,3,7,8-PeCDD	79	40 - 135
13C-1,2,3,6,7,8-HxCDD	69	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	88	40 - 135
13C-OCDD	121	40 - 135
13C-2,3,7,8-TCDF	76	40 - 135
13C-1,2,3,7,8-PeCDF	82	40 - 135
13C-1,2,3,4,7,8-HxCDF	71	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	78	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
D	Result was obtained from the analysis of a dilution.
E	Estimated result. Result concentration exceeds the calibration range.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-6 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 006	**Work Order #...:**	H3KXR2AC	**Matrix.....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	8D5
Prep Date.....:	05/05/06	**Analysis Date..:**	05/09/06	**Units.....:**	pg/g
Prep Batch #...:	6129536	**Dilution Factor:**	1	**% Moisture:**	73

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**2.3**			**1.000**	**2.3000**
Total TCDD	**65**				
1,2,3,7,8-PeCDD	**11**			**0.500**	**5.5000**
Total PeCDD	**90**				
1,2,3,4,7,8-HxCDD	**23**			**0.100**	**2.3000**
1,2,3,6,7,8-HxCDD	**64**			**0.100**	**6.4000**
1,2,3,7,8,9-HxCDD	**42**			**0.100**	**4.2000**
Total HxCDD	**460**				
1,2,3,4,6,7,8-HpCDD	**1400**			**0.010**	**14.0000**
Total HpCDD	**2300**				
OCDD	**10000**	**E**		**0.001**	**10.0000**
2,3,7,8-TCDF	**4.5**	**CON**		**0.100**	**0.4500**
Total TCDF	**72**				
1,2,3,7,8-PeCDF	**5.1**	**J**		**0.050**	**0.2500**
2,3,4,7,8-PeCDF	**5.7**			**0.500**	**2.8000**
Total PeCDF	**54**				
1,2,3,4,7,8-HxCDF	**20**			**0.100**	**2.0000**
1,2,3,6,7,8-HxCDF	**20**			**0.100**	**2.0000**
2,3,4,6,7,8-HxCDF	**11**			**0.100**	**1.1000**
1,2,3,7,8,9-HxCDF	ND		2.4	0.100	0
Total HxCDF	**420**				
1,2,3,4,6,7,8-HpCDF	**390**			**0.010**	**3.9000**
1,2,3,4,7,8,9-HpCDF	**34**			**0.010**	**0.3400**
Total HpCDF	**1300**				
OCDF	**1200**			**0.001**	**1.2000**
Total TEQ Concentration					**58.7400**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	78	40 - 135
13C-1,2,3,7,8-PeCDD	105	40 - 135
13C-1,2,3,6,7,8-HxCDD	70	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	78	40 - 135
13C-OCDD	98	40 - 135
13C-2,3,7,8-TCDF	49	40 - 135
13C-1,2,3,7,8-PeCDF	79	40 - 135
13C-1,2,3,4,7,8-HxCDF	61	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	65	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
E	Estimated result. Result concentration exceeds the calibration range.
J	Estimated result. Result is less than the reporting limit.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-7 DITCH ON E. SIDE

Lot-Sample #...:	G6D190216 - 007	**Work Order #...:**	H3KXX2AC	**Matrix....:**	SOLID
Date Sampled...:	04/17/06	**Date Received..:**	04/19/06	**Instrument:**	8D5
Prep Date.....:	05/05/06	**Analysis Date..:**	05/09/06	**Units.....:**	pg/g
Prep Batch #...:	6129536	**Dilution Factor:**	1	**% Moisture:**	50

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**1.9**			**1.000**	**1.9000**
Total TCDD	**40**				
1,2,3,7,8-PeCDD	**10**			**0.500**	**5.0000**
Total PeCDD	**81**				
1,2,3,4,7,8-HxCDD	**21**			**0.100**	**2.1000**
1,2,3,6,7,8-HxCDD	**60**			**0.100**	**6.0000**
1,2,3,7,8,9-HxCDD	**42**			**0.100**	**4.2000**
Total HxCDD	**400**				
1,2,3,4,6,7,8-HpCDD	**1000**	**E**		**0.010**	**10.0000**
Total HpCDD	**1800**				
OCDD	**6200**	**E**		**0.001**	**6.2000**
2,3,7,8-TCDF	**3.3**	**CON**		**0.100**	**0.3300**
Total TCDF	**44**				
1,2,3,7,8-PeCDF	**2.7**			**0.050**	**0.1400**
2,3,4,7,8-PeCDF	**3.3**			**0.500**	**1.7000**
Total PeCDF	**45**				
1,2,3,4,7,8-HxCDF	**11**			**0.100**	**1.1000**
1,2,3,6,7,8-HxCDF	**13**			**0.100**	**1.3000**
2,3,4,6,7,8-HxCDF	**13**			**0.100**	**1.3000**
1,2,3,7,8,9-HxCDF	ND		0.54	0.100	0
Total HxCDF	**340**				
1,2,3,4,6,7,8-HpCDF	**390**			**0.010**	**3.9000**
1,2,3,4,7,8,9-HpCDF	**15**			**0.010**	**0.1500**
Total HpCDF	**940**				
OCDF	**720**			**0.001**	**0.7200**
Total TEQ Concentration					**46.0400**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	78	40 - 135
13C-1,2,3,7,8-PeCDD	105	40 - 135
13C-1,2,3,6,7,8-HxCDD	71	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	87	40 - 135
13C-OCDD	103	40 - 135
13C-2,3,7,8-TCDF	55	40 - 135
13C-1,2,3,7,8-PeCDF	77	40 - 135
13C-1,2,3,4,7,8-HxCDF	65	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	70	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
E	Estimated result. Result concentration exceeds the calibration range.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-8 FOOT OF DEL NORTE

Lot-Sample #...:	G6D190216 - 008	**Work Order #...:**	H3KX01AC	**Matrix....:**	SOLID
Date Sampled...:	04/18/06	**Date Received..:**	04/19/06	**Instrument:**	1D5
Prep Date.....:	05/02/06	**Analysis Date..:**	05/05/06	**Units.....:**	pg/g
Prep Batch #...:	6122320	**Dilution Factor:**	1	**% Moisture:**	41

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**1.1**	**J**		**1.000**	**1.1000**
Total TCDD	**20**				
1,2,3,7,8-PeCDD	**4.8**	**J**		**0.500**	**2.4000**
Total PeCDD	**35**				
1,2,3,4,7,8-HxCDD	**9.0**			**0.100**	**0.9000**
1,2,3,6,7,8-HxCDD	**43**			**0.100**	**4.3000**
1,2,3,7,8,9-HxCDD	**21**			**0.100**	**2.1000**
Total HxCDD	**600**				
1,2,3,4,6,7,8-HpCDD	**1800**			**0.010**	**18.0000**
Total HpCDD	**10000**				
OCDD	**23000**	**E**		**0.001**	**23.0000**
2,3,7,8-TCDF	**2.8**	**CON**		**0.100**	**0.2800**
Total TCDF	**25**				
1,2,3,7,8-PeCDF	**5.9**	**J**		**0.050**	**0.2900**
2,3,4,7,8-PeCDF	**3.8**	**J**		**0.500**	**1.9000**
Total PeCDF	**26**				
1,2,3,4,7,8-HxCDF	**14**			**0.100**	**1.4000**
1,2,3,6,7,8-HxCDF	**6.3**			**0.100**	**0.6300**
2,3,4,6,7,8-HxCDF	**4.3**	**J**		**0.100**	**0.4300**
1,2,3,7,8,9-HxCDF	ND		0.96	0.100	0
Total HxCDF	**500**				
1,2,3,4,6,7,8-HpCDF	**290**			**0.010**	**2.9000**
1,2,3,4,7,8,9-HpCDF	**14**			**0.010**	**0.1400**
Total HpCDF	**1300**				
OCDF	**900**			**0.001**	**0.9000**
Total TEQ Concentration					**60.6700**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	79	40 - 135
13C-1,2,3,7,8-PeCDD	85	40 - 135
13C-1,2,3,6,7,8-HxCDD	76	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	84	40 - 135
13C-OCDD	78	40 - 135
13C-2,3,7,8-TCDF	84	40 - 135
13C-1,2,3,7,8-PeCDF	89	40 - 135
13C-1,2,3,4,7,8-HxCDF	80	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	83	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
E	Estimated result. Result concentration exceeds the calibration range.
J	Estimated result. Result is less than the reporting limit.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-9 FOOT OF DEL NORTE

Lot-Sample #...:	G6D190216 - 009	**Work Order #...:**	H3KX22AC	**Matrix....:**	SOLID
Date Sampled...:	04/18/06	**Date Received..:**	04/19/06	**Instrument:**	8D5
Prep Date.....:	05/05/06	**Analysis Date..:**	05/09/06	**Units.....:**	pg/g
Prep Batch #...:	6129536	**Dilution Factor:**	1	**% Moisture:**	39

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**0.49**			**1.000**	**0.4900**
Total TCDD	**9.5**				
1,2,3,7,8-PeCDD	**1.8**	**J**		**0.500**	**0.9000**
Total PeCDD	**13**				
1,2,3,4,7,8-HxCDD	**2.9**			**0.100**	**0.2900**
1,2,3,6,7,8-HxCDD	**12**			**0.100**	**1.2000**
1,2,3,7,8,9-HxCDD	**6.3**			**0.100**	**0.6300**
Total HxCDD	**150**				
1,2,3,4,6,7,8-HpCDD	**350**			**0.010**	**3.5000**
Total HpCDD	**1300**				
OCDD	**3100**	**E**		**0.001**	**3.1000**
2,3,7,8-TCDF	**1.8**	**CON**		**0.100**	**0.1800**
Total TCDF	**16**				
1,2,3,7,8-PeCDF	ND		1.0	0.050	0
2,3,4,7,8-PeCDF	ND		1.2	0.500	0
Total PeCDF	**7.9**				
1,2,3,4,7,8-HxCDF	**3.2**			**0.100**	**0.3200**
1,2,3,6,7,8-HxCDF	**1.8**	**J**		**0.100**	**0.1800**
2,3,4,6,7,8-HxCDF	**1.6**	**J**		**0.100**	**0.1600**
1,2,3,7,8,9-HxCDF	ND		0.16	0.100	0
Total HxCDF	**92**				
1,2,3,4,6,7,8-HpCDF	**79**			**0.010**	**0.7900**
1,2,3,4,7,8,9-HpCDF	**4.3**			**0.010**	**0.0430**
Total HpCDF	**360**				
OCDF	**240**			**0.001**	**0.2400**
Total TEQ Concentration					**12.0230**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	77	40 - 135
13C-1,2,3,7,8-PeCDD	97	40 - 135
13C-1,2,3,6,7,8-HxCDD	71	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	89	40 - 135
13C-OCDD	114	40 - 135
13C-2,3,7,8-TCDF	60	40 - 135
13C-1,2,3,7,8-PeCDF	75	40 - 135
13C-1,2,3,4,7,8-HxCDF	60	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	73	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
E	Estimated result. Result concentration exceeds the calibration range.
J	Estimated result. Result is less than the reporting limit.

Soil Water Air Protection Enterprise

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: S-10 HOOKSTON SLOUGH

Lot-Sample #...:	G6D190216 - 010	**Work Order #...:**	H3KX32AC	**Matrix.....:**	SOLID
Date Sampled...:	04/18/06	**Date Received..:**	04/19/06	**Instrument:**	8D5
Prep Date.....:	05/05/06	**Analysis Date..:**	05/09/06	**Units.....:**	pg/g
Prep Batch #...:	6129536	**Dilution Factor:**	1	**% Moisture:**	48

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.084	1.000	0
Total TCDD	ND		0.17		0
1,2,3,7,8-PeCDD	ND		0.082	0.500	0
Total PeCDD	ND		0.16		0
1,2,3,4,7,8-HxCDD	ND		0.11	0.100	0
1,2,3,6,7,8-HxCDD	ND		0.28	0.100	0
1,2,3,7,8,9-HxCDD	ND		0.31	0.100	0
Total HxCDD	ND		1.1		0
1,2,3,4,6,7,8-HpCDD	**4.8**	**J**		**0.010**	**0.0480**
Total HpCDD	**12**				
OCDD	**36**			**0.001**	**0.0360**
2,3,7,8-TCDF	ND		0.19	0.100	0
Total TCDF	ND		0.19		0
1,2,3,7,8-PeCDF	ND		0.044	0.050	0
2,3,4,7,8-PeCDF	ND		0.044	0.500	0
Total PeCDF	ND		0.19		0
1,2,3,4,7,8-HxCDF	ND		0.16	0.100	0
1,2,3,6,7,8-HxCDF	ND		0.065	0.100	0
2,3,4,6,7,8-HxCDF	ND		0.076	0.100	0
1,2,3,7,8,9-HxCDF	ND		0.088	0.100	0
Total HxCDF	ND		0.37		0
1,2,3,4,6,7,8-HpCDF	ND		0.74	0.010	0
1,2,3,4,7,8,9-HpCDF	ND		0.12	0.010	0
Total HpCDF	ND		1.5		0
OCDF	ND		1.6	0.001	0
Total TEQ Concentration					**0.0840**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	93	40 - 135
13C-1,2,3,7,8-PeCDD	120	40 - 135
13C-1,2,3,6,7,8-HxCDD	84	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	97	40 - 135
13C-OCDD	121	40 - 135
13C-2,3,7,8-TCDF	69	40 - 135
13C-1,2,3,7,8-PeCDF	94	40 - 135
13C-1,2,3,4,7,8-HxCDF	64	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	82	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

J Estimated result. Result is less than the reporting limit.

QC DATA ASSOCIATION SUMMARY

G6D190216

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
002	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
003	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
004	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
005	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
006	SOLID	SW846 8290		6129536	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
007	SOLID	SW846 8290		6129536	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
008	SOLID	SW846 8290		6122320	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
009	SOLID	SW846 8290		6129536	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
010	SOLID	SW846 8290		6129536	
	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 **Work Order #...:** H4HKK1AA **Matrix.....:** SOLID
MB Lot-Sample #: G6E020000-320

Prep Date.....: 05/02/06
Analysis Date..: 05/04/06 **Prep Batch #...:** 6122320
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.23	pg/g	SW846 8290
Total TCDD	ND	0.23	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.41	pg/g	SW846 8290
Total PeCDD	ND	0.90	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.28	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	0.25	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	0.25	pg/g	SW846 8290
Total HxCDD	ND	0.28	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	ND	0.47	pg/g	SW846 8290
Total HpCDD	ND	0.47	pg/g	SW846 8290
OCDD	ND	3.5	pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.16	pg/g	SW846 8290
Total TCDF	ND	0.16	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.23	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.22	pg/g	SW846 8290
Total PeCDF	ND	0.25	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	0.19	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.17	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.19	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.19	pg/g	SW846 8290
Total HxCDF	ND	0.19	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	ND	0.28	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.19	pg/g	SW846 8290
Total HpCDF	ND	0.28	pg/g	SW846 8290
OCDF	ND	0.45	pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	75	(40 - 135)
13C-1,2,3,7,8-PeCDD	80	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	92	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	81	(40 - 135)
13C-OCDD	73	(40 - 135)
13C-2,3,7,8-TCDF	84	(40 - 135)
13C-1,2,3,7,8-PeCDF	85	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	84	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	89	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 **Work Order #...:** H42D31AA **Matrix.....:** SOLID
MB Lot-Sample #: G6E090000-536

Prep Date.....: 05/05/06
Analysis Date..: 05/09/06 **Prep Batch #...:** 6129536
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.044	pg/g	SW846 8290
Total TCDD	ND	0.044	pg/g	SW846 8290
1,2,3,7,8-PeCDD	ND	0.10	pg/g	SW846 8290
Total PeCDD	ND	0.10	pg/g	SW846 8290
1,2,3,4,7,8-HxCDD	ND	0.10	pg/g	SW846 8290
1,2,3,6,7,8-HxCDD	ND	0.080	pg/g	SW846 8290
1,2,3,7,8,9-HxCDD	ND	0.084	pg/g	SW846 8290
Total HxCDD	ND	0.10	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDD	ND	0.28	pg/g	SW846 8290
Total HpCDD	ND	0.28	pg/g	SW846 8290
OCDD	ND	2.0	pg/g	SW846 8290
2,3,7,8-TCDF	ND	0.062	pg/g	SW846 8290
Total TCDF	ND	0.062	pg/g	SW846 8290
1,2,3,7,8-PeCDF	ND	0.056	pg/g	SW846 8290
2,3,4,7,8-PeCDF	ND	0.056	pg/g	SW846 8290
Total PeCDF	ND	0.057	pg/g	SW846 8290
1,2,3,4,7,8-HxCDF	ND	0.087	pg/g	SW846 8290
1,2,3,6,7,8-HxCDF	ND	0.074	pg/g	SW846 8290
2,3,4,6,7,8-HxCDF	ND	0.088	pg/g	SW846 8290
1,2,3,7,8,9-HxCDF	ND	0.099	pg/g	SW846 8290
Total HxCDF	ND	0.099	pg/g	SW846 8290
1,2,3,4,6,7,8-HpCDF	ND	0.12	pg/g	SW846 8290
1,2,3,4,7,8,9-HpCDF	ND	0.15	pg/g	SW846 8290
Total HpCDF	ND	0.15	pg/g	SW846 8290
OCDF	ND	0.15	pg/g	SW846 8290

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	75	(40 - 135)
13C-1,2,3,7,8-PeCDD	81	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	70	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	84	(40 - 135)
13C-OCDD	107	(40 - 135)
13C-2,3,7,8-TCDF	58	(40 - 135)
13C-1,2,3,7,8-PeCDF	65	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	52	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	72	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 **Work Order #...:** H4HKK1AC **Matrix.....:** SOLID
LCS Lot-Sample#: G6E020000-320
Prep Date.....: 05/02/06 **Analysis Date..:** 05/04/06
Prep Batch #...: 6122320
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	**20.0**	**18.9**	**pg/g**	**95**	**SW846 8290**
1,2,3,7,8-PeCDD	**100**	**105**	**pg/g**	**105**	**SW846 8290**
1,2,3,4,7,8-HxCDD	**100**	**95.6**	**pg/g**	**96**	**SW846 8290**
1,2,3,6,7,8-HxCDD	**100**	**98.9**	**pg/g**	**99**	**SW846 8290**
1,2,3,7,8,9-HxCDD	**100**	**96.5**	**pg/g**	**97**	**SW846 8290**
1,2,3,4,6,7,8-HpCDD	**100**	**98.7**	**pg/g**	**99**	**SW846 8290**
OCDD	**200**	**202**	**pg/g**	**101**	**SW846 8290**
2,3,7,8-TCDF	**20.0**	**19.1**	**pg/g**	**95**	**SW846 8290**
1,2,3,7,8-PeCDF	**100**	**99.0**	**pg/g**	**99**	**SW846 8290**
2,3,4,7,8-PeCDF	**100**	**106**	**pg/g**	**106**	**SW846 8290**
1,2,3,4,7,8-HxCDF	**100**	**110**	**pg/g**	**110**	**SW846 8290**
1,2,3,6,7,8-HxCDF	**100**	**108**	**pg/g**	**108**	**SW846 8290**
2,3,4,6,7,8-HxCDF	**100**	**113**	**pg/g**	**113**	**SW846 8290**
1,2,3,7,8,9-HxCDF	**100**	**106**	**pg/g**	**106**	**SW846 8290**
1,2,3,4,6,7,8-HpCDF	**100**	**102**	**pg/g**	**102**	**SW846 8290**
1,2,3,4,7,8,9-HpCDF	**100**	**92.2**	**pg/g**	**92**	**SW846 8290**
OCDF	**200**	**197**	**pg/g**	**99**	**SW846 8290**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	67	(40 - 135)
13C-1,2,3,7,8-PeCDD	72	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	84	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	77	(40 - 135)
13C-OCDD	68	(40 - 135)
13C-2,3,7,8-TCDF	71	(40 - 135)
13C-1,2,3,7,8-PeCDF	76	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	77	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	84	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 Work Order #...: H4HKK1AC Matrix.....: SOLID
LCS Lot-Sample#: G6E020000-320
Prep Date.....: 05/02/06 Analysis Date..: 05/04/06
Prep Batch #...: 6122320
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	**95**	**(71 - 128)**	**SW846 8290**
1,2,3,7,8-PeCDD	**105**	**(73 - 134)**	**SW846 8290**
1,2,3,4,7,8-HxCDD	**96**	**(66 - 137)**	**SW846 8290**
1,2,3,6,7,8-HxCDD	**99**	**(75 - 131)**	**SW846 8290**
1,2,3,7,8,9-HxCDD	**97**	**(74 - 135)**	**SW846 8290**
1,2,3,4,6,7,8-HpCDD	**99**	**(76 - 130)**	**SW846 8290**
OCDD	**101**	**(74 - 133)**	**SW846 8290**
2,3,7,8-TCDF	**95**	**(71 - 134)**	**SW846 8290**
1,2,3,7,8-PeCDF	**99**	**(74 - 130)**	**SW846 8290**
2,3,4,7,8-PeCDF	**106**	**(71 - 133)**	**SW846 8290**
1,2,3,4,7,8-HxCDF	**110**	**(73 - 132)**	**SW846 8290**
1,2,3,6,7,8-HxCDF	**108**	**(69 - 139)**	**SW846 8290**
2,3,4,6,7,8-HxCDF	**113**	**(75 - 147)**	**SW846 8290**
1,2,3,7,8,9-HxCDF	**106**	**(71 - 140)**	**SW846 8290**
1,2,3,4,6,7,8-HpCDF	**102**	**(75 - 131)**	**SW846 8290**
1,2,3,4,7,8,9-HpCDF	**92**	**(68 - 138)**	**SW846 8290**
OCDF	**99**	**(68 - 142)**	**SW846 8290**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	67	(40 - 135)
13C-1,2,3,7,8-PeCDD	72	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	84	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	77	(40 - 135)
13C-OCDD	68	(40 - 135)
13C-2,3,7,8-TCDF	71	(40 - 135)
13C-1,2,3,7,8-PeCDF	76	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	77	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	84	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 Work Order #...: H42D31AC Matrix.....: SOLID
LCS Lot-Sample#: G6E090000-536
Prep Date.....: 05/05/06 Analysis Date..: 05/09/06
Prep Batch #...: 6129536
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	20.0	16.2	pg/g	81	SW846 8290
1,2,3,7,8-PeCDD	100	82.0	pg/g	82	SW846 8290
1,2,3,4,7,8-HxCDD	100	90.7	pg/g	91	SW846 8290
1,2,3,6,7,8-HxCDD	100	85.9	pg/g	86	SW846 8290
1,2,3,7,8,9-HxCDD	100	93.1	pg/g	93	SW846 8290
1,2,3,4,6,7,8-HpCDD	100	94.0	pg/g	94	SW846 8290
OCDD	200	187	pg/g	93	SW846 8290
2,3,7,8-TCDF	20.0	21.0	pg/g	105	SW846 8290
1,2,3,7,8-PeCDF	100	95.2	pg/g	95	SW846 8290
2,3,4,7,8-PeCDF	100	95.5	pg/g	95	SW846 8290
1,2,3,4,7,8-HxCDF	100	111	pg/g	111	SW846 8290
1,2,3,6,7,8-HxCDF	100	105	pg/g	105	SW846 8290
2,3,4,6,7,8-HxCDF	100	119	pg/g	119	SW846 8290
1,2,3,7,8,9-HxCDF	100	129	pg/g	129	SW846 8290
1,2,3,4,6,7,8-HpCDF	100	98.5	pg/g	99	SW846 8290
1,2,3,4,7,8,9-HpCDF	100	110	pg/g	110	SW846 8290
OCDF	200	182	pg/g	91	SW846 8290

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	73	(40 - 135)
13C-1,2,3,7,8-PeCDD	87	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	71	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	80	(40 - 135)
13C-OCDD	105	(40 - 135)
13C-2,3,7,8-TCDF	57	(40 - 135)
13C-1,2,3,7,8-PeCDF	68	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	52	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	71	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G6D190216 Work Order #...: H42D31AC Matrix.....: SOLID
LCS Lot-Sample#: G6E090000-536
Prep Date.....: 05/05/06 Analysis Date..: 05/09/06
Prep Batch #...: 6129536
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	**81**	**(71 - 128)**	**SW846 8290**
1,2,3,7,8-PeCDD	**82**	**(73 - 134)**	**SW846 8290**
1,2,3,4,7,8-HxCDD	**91**	**(66 - 137)**	**SW846 8290**
1,2,3,6,7,8-HxCDD	**86**	**(75 - 131)**	**SW846 8290**
1,2,3,7,8,9-HxCDD	**93**	**(74 - 135)**	**SW846 8290**
1,2,3,4,6,7,8-HpCDD	**94**	**(76 - 130)**	**SW846 8290**
OCDD	**93**	**(74 - 133)**	**SW846 8290**
2,3,7,8-TCDF	**105**	**(71 - 134)**	**SW846 8290**
1,2,3,7,8-PeCDF	**95**	**(74 - 130)**	**SW846 8290**
2,3,4,7,8-PeCDF	**95**	**(71 - 133)**	**SW846 8290**
1,2,3,4,7,8-HxCDF	**111**	**(73 - 132)**	**SW846 8290**
1,2,3,6,7,8-HxCDF	**105**	**(69 - 139)**	**SW846 8290**
2,3,4,6,7,8-HxCDF	**119**	**(75 - 147)**	**SW846 8290**
1,2,3,7,8,9-HxCDF	**129**	**(71 - 140)**	**SW846 8290**
1,2,3,4,6,7,8-HpCDF	**99**	**(75 - 131)**	**SW846 8290**
1,2,3,4,7,8,9-HpCDF	**110**	**(68 - 138)**	**SW846 8290**
OCDF	**91**	**(68 - 142)**	**SW846 8290**

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	73	(40 - 135)
13C-1,2,3,7,8-PeCDD	87	(40 - 135)
13C-1,2,3,6,7,8-HxCDD	71	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDD	80	(40 - 135)
13C-OCDD	105	(40 - 135)
13C-2,3,7,8-TCDF	57	(40 - 135)
13C-1,2,3,7,8-PeCDF	68	(40 - 135)
13C-1,2,3,4,7,8-HxCDF	52	(40 - 135)
13C-1,2,3,4,6,7,8-HpCDF	71	(40 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

General Chemistry - Various Methods

Soil Water Air Protection Enterprise

Client Sample ID: S-1 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-001 Work Order #...: H3KXA Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	20.5		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	36400 Q	2000	mg/kg	SW846 9060 (Modif	04/26-05/02/06	6116162
	Dilution Factor: 2					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-2 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-002 Work Order #...: H3KXK Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	68.7		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	93700 Q	2000	mg/kg	SW846 9060 (Modif	04/26-05/02/06	6116162
	Dilution Factor: 2					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-3 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-003 Work Order #...: H3KXN Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	92.1		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	352000 Q	10000	mg/kg	SW846 9060 (Modif	04/26-05/01/06	6116162
	Dilution Factor: 10					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-4 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-004 Work Order #...: H3KXP Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	69.7		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	391000 Q	10000	mg/kg	SW846 9060 (Modif	04/26-05/01/06	6116162
	Dilution Factor: 10					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-5 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-005 Work Order #...: H3KXQ Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	86.4		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	209000 Q	10000	mg/kg	SW846 9060 (Modif	04/26-05/01/06	6116162
	Dilution Factor: 10					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-6 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-006 Work Order #...: H3KXR Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	73.1		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	64900 Q	2000	mg/kg	SW846 9060 (Modif	04/26-05/02/06	6116162
	Dilution Factor: 2					

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

Soil Water Air Protection Enterprise

Client Sample ID: S-7 DITCH ON E. SIDE

General Chemistry

Lot-Sample #...: G6D190216-007 Work Order #...: H3KXX Matrix.....: SOLID
Date Sampled...: 04/17/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	50.3		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	37400	1000	mg/kg	SW846 9060 (Modif	04/26-04/28/06	6116162
	Dilution Factor: 1					

Soil Water Air Protection Enterprise

Client Sample ID: S-8 FOOT OF DEL NORTE

General Chemistry

Lot-Sample #...: G6D190216-008 Work Order #...: H3KX0 Matrix.....: SOLID
Date Sampled...: 04/18/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	41.5		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	31300	1000	mg/kg	SW846 9060 (Modif	04/26-04/28/06	6116162
	Dilution Factor: 1					

Soil Water Air Protection Enterprise

Client Sample ID: S-9 FOOT OF DEL NORTE

General Chemistry

Lot-Sample #...: G6D190216-009 Work Order #...: H3KX2 Matrix.....: SOLID
Date Sampled...: 04/18/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	39.4		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	21600	1000	mg/kg	SW846 9060 (Modif	04/26-05/01/06	6116162
	Dilution Factor: 1					

Soil Water Air Protection Enterprise

Client Sample ID: S-10 HOOKSTON SLOUGH

General Chemistry

Lot-Sample #...: G6D190216-010 Work Order #...: H3KX3 Matrix.....: SOLID
Date Sampled...: 04/18/06 Date Received..: 04/19/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	47.6		%	ASTM D 2216-90	04/20-04/21/06	6110536
	Dilution Factor: 1					
Total Organic Carbon	17700	1000	mg/kg	SW846 9060 (Modif	04/26-05/01/06	6116162
	Dilution Factor: 1					

QC DATA ASSOCIATION SUMMARY

G6D190216

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
002	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
003	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
004	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
005	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
006	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
007	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
008	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
009	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305
010	SOLID	SW846 9060 (Modif		6116162	6116095
	SOLID	ASTM D 2216-90		6110536	6110305

METHOD BLANK REPORT

General Chemistry

Client Lot #...: G6D190216 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		Work Order #: H33PL1AA		MB Lot-Sample #:	G6D260000-162	
	ND	1000	mg/kg	SW846 9060 (Modif	04/26-04/28/06	6116162
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: G6D190216 **Matrix.....:** SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		Work Order #: H33PL1AC		LCS Lot-Sample#: G6D260000-162			
	8360	9300	mg/kg	111	SW846 9060 (Modif	04/26-04/28/06	6116162
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: G6D190216

Matrix.....: SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon	111	Work Order #: H33PL1AC (75 - 125) Dilution Factor: 1	LCS Lot-Sample#: G6D260000-162 SW846 9060 (Modif	04/26-04/28/06	6116162

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: G6D190216
Date Sampled...: 04/17/06 **Date Received..:** 04/19/06 **Matrix.....:** SOLID

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon			WO#: H3KXA1AF-MS/H3KXA1AG-MSD				MS Lot-Sample #: G6D190216-001		
	36400	54300	85700	mg/kg	91		SW846 9060 (M	04/26-05/02/06	6116162
	36400	54900	84800	mg/kg	88	1.0	SW846 9060 (M	04/26-05/02/06	6116162
			Dilution Factor: 2						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: G6D190216
Date Sampled...: 04/17/06 **Date Received..:** 04/19/06 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		WO#: H3KXA1AF-MS/H3KXA1AG-MSD				MS Lot-Sample #: G6D190216-001	
	91	(75 - 125)			SW846 9060 (Modif	04/26-05/02/06	6116162
	88	(75 - 125)	1.0	(0-25)	SW846 9060 (Modif	04/26-05/02/06	6116162
		Dilution Factor: 2					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: G6D190216 Work Order #...: H3JDT-SMP H3JDT-DUP Matrix.....: SOLID

Date Sampled...: 04/18/06 Date Received..: 04/18/06

% Moisture.....: 16

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture						SD Lot-Sample #: G6D180335-001		
	16.3	17.2	%	5.5	(0-10)	ASTM D 2216-90	04/20-04/21/06	6110536

Dilution Factor: 1

SOLID, 8151A, Pentachlorophenol Performed at STL Mobile

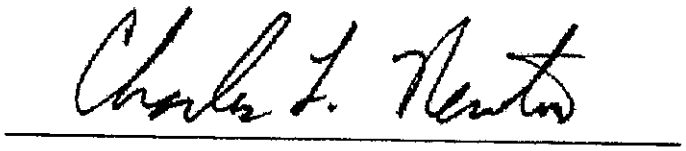
ANALYTICAL REPORT

Job Number: 700-11465-1

Job Description: STL Sacramento

For:
Severn Trent Laboratories, Inc.
880 Riverside Parkway
West Sacramento, CA 95605

Attention: Nilo Ligi



Charles Newton
Project Manager I
cnewton@stl-inc.com
05/09/2006

Project Manager: Charles Newton

Client: Severn Trent Laboratories, Inc.
Date: 05/09/2006

semivolatiles gc

ISTD in sample failed

The internal standard (Dibutylchlorendate) recovered below method 8151A control limits (+/-50%) in samples: 11465-A-1, 11465-A-8, 11465-A-9, 11465-A-10 and associated batch QC samples. The samples and the QC extracts were re-prepped and re-analyzed with similar results. All other QA/QC requirements were met. No additional sample remained for re-extraction.

Affected Items

LCSD 700-20194/3-A

Batch: 700-20892
Method: 700-8151A

LCS 700-20194/2-A

Batch: 700-20892
Method: 700-8151A

MB 700-20194/1-A

Batch: 700-20892
Method: 700-8151A

METHOD SUMMARY

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Chlorinated Herbicides by GC	STL-MOB	SW846 8151A	
Chlorinated Herbicides by GC - Solids Prep	STL-MOB		SW846 8151A
Percent Moisture	STL-MOB	EPA PercentMoisture	

LAB REFERENCES:

STL-MOB = STL-Mobile

METHOD REFERENCES:

EPA - US Environmental Protection Agency

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Method	Analyst	Analyst ID
SW846 8151A	Nguyen, Khanh	KN

SAMPLE SUMMARY

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
700-11465-1	S-1 Ditch on E Side	Solid	04/17/2006 0315	04/20/2006 1032
700-11465-2	S-2 Ditch on E Side	Solid	04/17/2006 0350	04/20/2006 1032
700-11465-3	S-3 Ditch on E Side	Solid	04/17/2006 0420	04/20/2006 1032
700-11465-4	S-4 Ditch on E Side	Solid	04/17/2006 0445	04/20/2006 1032
700-11465-5	S-5 Ditch on E Side	Solid	04/17/2006 0530	04/20/2006 1032
700-11465-6	S-6 Ditch on E Side	Solid	04/17/2006 0550	04/20/2006 1032
700-11465-7	S-7 Ditch on E Side	Solid	04/17/2006 0605	04/20/2006 1032
700-11465-8	S-8 Foot of Del Norte	Solid	04/18/2006 1155	04/20/2006 1032
700-11465-9	S-9 Foot of Del Norte	Solid	04/18/2006 1230	04/20/2006 1032
700-11465-10	S-10 Hookston Slough	Solid	04/18/2006 0135	04/20/2006 1032

SAMPLE RESULTS

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-1 Ditch on E Side**

Lab Sample ID: 700-11465-1
Client Matrix: Solid % Moisture: 79.5

Date Sampled: 04/17/2006 0315
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 05/05/2006 2305
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050513.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		2.6		1.8	2.4

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	37	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-2 Ditch on E Side**

Lab Sample ID: 700-11465-2
Client Matrix: Solid % Moisture: 31.3

Date Sampled: 04/17/2006 0350
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 20
Date Analyzed: 05/09/2006 1317
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050908.D
Initial Weight/Volume: 41.6 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		130	*	13	17

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	34	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-3 Ditch on E Side**

Lab Sample ID: 700-11465-3
Client Matrix: Solid % Moisture: 7.9

Date Sampled: 04/17/2006 0420
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 50
Date Analyzed: 05/08/2006 1536
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050804.D
Initial Weight/Volume: 17.4 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		1400	*	56	78

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	15	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-4 Ditch on E Side**

Lab Sample ID: 700-11465-4
Client Matrix: Solid % Moisture: 30.3

Date Sampled: 04/17/2006 0445
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 04/26/2006 2309
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z042615.D
Initial Weight/Volume: 21.8 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		570	E *	1.2	1.6

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	44	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-4 Ditch on E Side**

Lab Sample ID: 700-11465-4
Client Matrix: Solid % Moisture: 30.3

Date Sampled: 04/17/2006 0445
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 2000
Date Analyzed: 05/09/2006 1051
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050904.D
Initial Weight/Volume: 21.8 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: SECONDARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		86000	*	2400	3300

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-4 Ditch on E Side**

Lab Sample ID: 700-11465-4
Client Matrix: Solid % Moisture: 30.3

Date Sampled: 04/17/2006 0445
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Client Sample ID: **S-5 Ditch on E Side**

Lab Sample ID: 700-11465-5
Client Matrix: Solid % Moisture: 13.6

Date Sampled: 04/17/2006 0530
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 5.0
Date Analyzed: 05/06/2006 0236
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050519.D
Initial Weight/Volume: 22.5 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		140		4.6	6.4

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	21	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-6 Ditch on E Side**

Lab Sample ID: 700-11465-6
Client Matrix: Solid % Moisture: 26.9

Date Sampled: 04/17/2006 0550
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 05/08/2006 1721
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050807.D
Initial Weight/Volume: 31.4 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		4.3	*	0.78	1.1

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	38	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-7 Ditch on E Side**

Lab Sample ID: 700-11465-7
Client Matrix: Solid % Moisture: 49.7

Date Sampled: 04/17/2006 0605
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 05/08/2006 1756
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050808.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		2.8	*	0.72	0.99

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	20	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-8 Foot of Del Norte**

Lab Sample ID: 700-11465-8
Client Matrix: Solid % Moisture: 58.5

Date Sampled: 04/18/2006 1155
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 05/06/2006 0716
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050527.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		18		0.87	1.2

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	31	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-9 Foot of Del Norte**

Lab Sample ID: 700-11465-9
Client Matrix: Solid % Moisture: 60.6

Date Sampled: 04/18/2006 1230
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 1.0
Date Analyzed: 05/06/2006 0751
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050528.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		9.1		0.91	1.3

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	67	10 - 135

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Client Sample ID: **S-10 Hookston Slough**

Lab Sample ID: 700-11465-10
Client Matrix: Solid % Moisture: 52.4

Date Sampled: 04/18/2006 0135
Date Received: 04/20/2006 1032

8151A Chlorinated Herbicides by GC

Method: 8151A
Preparation: 8151A
Dilution: 2.0
Date Analyzed: 05/06/2006 0826
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194

Instrument ID: SGZ
Lab File ID: Z050529.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Pentachlorophenol		19		1.5	2.1

Surrogate	%Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	35	10 - 135

DATA REPORTING QUALIFIERS

Client: Severn Trent Laboratories, Inc. Job Number: 700-11465-1

Lab Section	Qualifier	Description
GC Semi VOA		
	U	Analyte was not detected at or above the reporting limit.
	*	LCS, LCSD, MS, MSD, MD, or Surrogate exceeds the control limits
	E	Result exceeded calibration range, secondary dilution required.

QUALITY CONTROL RESULTS

Client: Severn Trent Laboratories, Inc.

Job Number: 700-11465-1

Method Blank - Batch: 700-20194

Method: 8151A
Preparation: 8151A

Lab Sample ID: MB 700-20194/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/05/2006 2230
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194
Units: ug/Kg

Instrument ID: SGZ
Lab File ID: Z050512.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Pentachlorophenol	0.50	U	0.36	0.50

Surrogate	% Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	47	10 - 135

Laboratory Control/
Laboratory Control Duplicate Recovery Report - Batch: 700-20194

Method: 8151A
Preparation: 8151A

LCS Lab Sample ID: LCS 700-20194/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/05/2006 2155
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194
Units: ug/Kg

Instrument ID: SGZ
Lab File ID: Z050511.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

LCSD Lab Sample ID: LCSD 700-20194/3-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 05/05/2006 2120
Date Prepared: 04/24/2006 0830

Analysis Batch: 700-20892
Prep Batch: 700-20194
Units: ug/Kg

Instrument ID: SGZ
Lab File ID: Z050510.D
Initial Weight/Volume: 50.0 g
Final Weight/Volume: 2.5 mL
Injection Volume:
Column ID: PRIMARY

Analyte	% Rec. LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Pentachlorophenol	18	9	16 - 132	68	40		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
2,4-Dichlorophenylacetic acid	39	43	10 - 135

Calculations are performed before rounding to avoid round-off errors in calculated results.

ATTACHMENT 3:

Field Forms

4/17/06 INSTRUMENT CALIBRATION ON REVERSE
2:00 PM
4/17/06

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-1
Sample Location: East Ditch
Sampled By: Hesse
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 3:15			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Field ~~Analysis~~ Parameters	Container Requirements	Collected	Other
Water Depth	3"		
Core Length	5"		
Sediment Texture: Clay, silt, sand, wet			
Pore Water:			
pH:	4.31		
Spec. Cond:	0.059 mS/cm		
Temp:	19.8°C		
DO:	5.77 mg/L		

OBSERVATIONS / NOTES:

current dir: 0

MAP:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

RcH

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-2
Sample Location: E Ditch
Sampled By: Hasso Hagemann
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[x] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[x] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 3:50			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Field Parameters			
Water Depth	2"		
Core Length	6"		
Sediment Tex	Silt, Clay, org		
Bore water	Drilling Water		
pH 6.42	pH	6.63	
Spec Cond 0.019 ms/cm	Spec Cond	0.093	ms/cm
Temp 17°C	Temp	16.02	mg/L
DO 9.32 mg/L	DO	16.02	mg/L

OBSERVATIONS / NOTES:

current dir: NJ current
texture: silt, clay, org (grass)

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Rcf

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-3
Sample Location: E Ditch
Sampled By: Kevin Hagemann
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 4:20	0-6"		
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Field Parameters			
Water Depth			
Core Length	6"		
Sediment Tex	grab glass		
Pore Water	overlying Water		
pH 6.71	pH	6.98	
Spec Cond 1.34 mS/cm	Spec Cond	0.17 mS/cm	
Temp 14.77°C	Temp	19.12 C	
DO 16.90 mg/L	DO:	11.99 mg/L	

OBSERVATIONS / NOTES:

current dir: South

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

RCH

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-4
Sample Location: E. Ditch
Sampled By: Hesse Hoffmann
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 4:45	0-6"	Brown	
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Field Parameters			
Water Depth:	2'		
Core Length:	6"		
Sediment Tex:	Surface		
Pore Water:	Overlying Water		
pH 6.06	pH	6.76	
Spec. Cond 1.93 ms/cm	Spec. Cond	0.136 ms/cm	
Temp 16.84 C	Temp	20.34	°
DO 13.67 mg/L	DO	11.2	mg/L

OBSERVATIONS / NOTES:

Current dir: Slack

MAP:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

Rott

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-5
Sample Location: E Ditch
Sampled By: Hass & Hagemann
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 5:30	0-~~6~~11"	brown black	
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Field Analysis	Parameter	Container Requirements	Collected	Other
Water Depth		2"		
Core Length		3"		
Sediment Tex		Clay silt w/ org		
Pore Water		Overlying Water		
pH: 6.83		pH:	6.89	
Spec Cond: 10.19		Spec Cond:	0.141	ms/cm
Temp: 7.25	ms/cm	Temp	17.95	
DO: 10.65		DO:	16.00	mg/L

OBSERVATIONS / NOTES:

current dir: slack

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Kat

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-6
Sample Location: E. Ditch
Sampled By: Jessa Hageman
C.O.C. No.:

- [ ] Surface Soil
- [ ] Subsurface Soil
- [x] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: ~~7:20~~ 5:52	0-6"		
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Field Analysis/ Parameters	Container Requirements	Collected	Other
Water Depth			
Core Length			
Sediment Tex			
Para Water	Overlying Water		
pH: 6.72	DH	6.62	
Spec Cond: .29	mS/cm Spec Cond	0.211	mS/cm
Temp: 15.2°C	Temp	16.0	
DO: 19.45 mg/L	DO:	17.72	mg/L

OBSERVATIONS / NOTES:

current dir:
flowing to S

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

RcH

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-7
Sample Location: E. Ditch
Sampled By: Hesse/Hagemann
C.O.C. No.:

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/17/06 Time 6:05 pm Method: Monitor Reading (ppm):	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: / Method: / Monitor Readings (Range in ppm):	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Field Analysis Parameters	Container Requirements	Collected	Other
Water Depth: 6"			
Core Length 6"			
Sed. Texture silty clay			
Pore Water		Overlying water	
pH 6.58		pH 6.73	
Spec Cond 2412 ms/cm		Spec Cond	
Temp 14.05°C		Temp 13.84	
DO 12.02 mg/L		DO 20.24	

OBSERVATIONS / NOTES:

current dir: S.

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

RC

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-8
Sample Location: W. Perimeter
Sampled By: Haberman/Rose
C.O.C. No.:

- [ ] Surface Soil
- [ ] Subsurface Soil
- [x] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/18/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 12:20 Hrs			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Field Analysis	Container Requirements	Collected	Other
Field Parameters			
Water Depth: 1 1/2" - 6"			
Core Location			
Sed Texture: mud, silt, pebbles			
pH 7.4			
Spec cond 3.456 ms/cm			
Temp 14.15°C			
DO 25.72 mg/L			

Field Parameters taken from water flowing from bulkhead

OBSERVATIONS / NOTES:

Low tide at 10:20 AM
exposed mud flat

MAP:

Bay water @ Pier
17.19°C
29.6 ms/cm
7.7 mg/L DO

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): 8.13 pH
RCH 273.8 ORP

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: Simpson Plywood
Project No.:

Sample ID No.: S-9
Sample Location: W. Perimeter
Sampled By: Hagemann / Hagemann
C.O.C. No.:

- [ ] Surface Soil
- [ ] Subsurface Soil
- [x] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/18/06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: ~~10:55~~ 12:30	0-6"	Black	
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Field Analysis Parameters	Container Requirements	Collected	Other
Water depth: 0			
Core length 6"			
Soil texture mud			
Surface pH 6.49			
Water Spec Cond 18 µs/cm			
Temp 14.97°C			
DO 19.35 mg/L			

OBSERVATIONS / NOTES:

- Low tide @ 10:22 AM
- exposed mud flat
- surface water in rivulet @ 5 gpm (sampled for field parameters)

MAP:

Circle if Applicable: MS/MSD | Duplicate ID No.:

Signature(s): Rcf

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

Project Site Name: S-10
Project No.: Simpson Pl[illegible]

Sample ID No.: S-10
Sample Location: [illegible]
Sampled By: [illegible]
C.O.C. No.:

- [] Surface Soil
- [] Subsurface Soil
- [X] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 1:35 pm Time: 4/18 Method: Monitor Reading (ppm):	0-6"	black	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

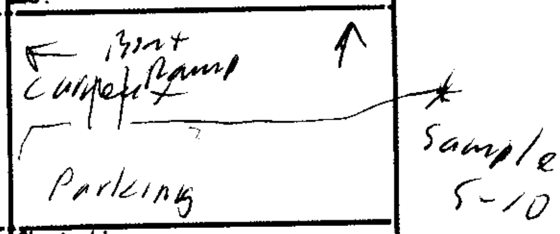
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Field Parameters			
Water Depth	0		
Core Length	6"		
Soil texture:	clay		
Surface Water:			
Temp: 13.2 °C			
Spec. Cond.: 8.04	ms/sec		
DO: 1.2	mg/L		
pH: 6.28			
ORP: -224	8		

OBSERVATIONS / NOTES:

current flowing W

MAP:



Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s): KCH

ATTACHMENT 4:

Field Notes

4/17/06 Humboldt Sampling w/ Rob

11:45 Arrive ACV

1:30 Arrive Humboldt + Bay Keeper calibrate instrument, prepare equipment, fill forms

Weather: clear; 50°; wind 10 mph, W; Press: 30.35 in.

2:30 Arrive site, recon locations

3:00 Prepare sampling eq.

3:30 S-1 14.8° C
0.084 mS/cm
8.77 mg/L
6.31 pH
2160 ORP
Collected ~50 N of NE corner
N 40° 47.620'
W 124° 11.056'

S-1 cont.

3:45 Overlying Pore water
22.22°C
0.068 mS/cm
8.00 DO mg/L
6.76 pH
287.0 ORP

3:50 S-2 6" core recovery

92' SA NE corner of bldg

N 40° 47.596'
W 124° 11.063'

pore water:
17.00°C
0.049 mS/cm
9.32 mg/L
6.02 pH
1.56 ORP

Texture: silt, clay, organic (grass)

overlying water (2' deep)
13.9°C
0.093 mS/cm
16.02 mg/L
6.67 pH
160.0 ORP

4:20 5-3 Located next to pole labeled "283"

pore 16.77 °C
1.364 mS/cm
16.90 mg/L
6.71 pH
491.4 ORP

Coordinates
N 40° 47.526'
W 124° 11.092'

Overlying 19.12 °C
0.117 mS/cm
11.89 mg/L
6.98 pH
496.4 ORP

6" core recovery
org clay in texture

S-4 4:45 PM

20' N of Standpipe

Porewater — Overlying

16.84 °C — 20.34 °C

1.431 mS/cm — 0.136 mS/cm

13.52 mg/L — 11.20 mg/L

6.06 pH — 6.76 pH

234 ORP — 124 ORP

6" of core recovery: top two inches silt & clay

Coordinates:

40° 47.550'

124° 11.085'

Sample was taken at SE corner of concrete bldg. (Spray foam)

Noticible sheen and hydrocarbon odor

5:30 PM S-5

pore water	12.35 °C	17.45 °C
	10.19 ms/cm	0.141 ms/cm
	10.69 mg/L	16.00 mg/L
	6.83 pH	6.89 pH
	-1224.4 ORP	-1224.9 ORP

Sample collected at SE corner of office bldg. N 40° 47.527' W 124° 11.104'

texture - silt + clay w/ grass

strong rotten egg odor

S-6

5:50 PM

Sampled 15' N of culvert entrance on N. side of Del Norte Sq

N 40° 47.45'
W 124° 11.824'

6" of standing water

pore water	standing water
15.2 °C	16.0 °C
.270 ms/cm	0.211 ms/cm
19.45 mg/L	17.72 mg/L
6.72 pH	6.62 pH
-122.3 ORP	-224.2 ORP

texture silt clay

S-7 6.05 am

Porewater	Stream
14.05° C	13.89° C
2.142 ms/cm	0.386 ms/cm
17.02 mg/L	20.24 mg/L
6.58 pH	6.23 pH
-124 ORP	-39.3 ORP

- Sample depth 0-6"
- Core recovery 6"
- ~~texture~~ color: black brown
  texture: silty clay

Sample taken at S. side of Del Norte St just S. of culvert

N 40° 47.436'
W 124° 11.130'

4/18/06

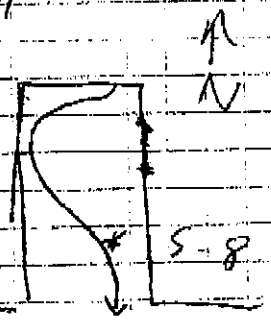
11:15 Arrived at Foot of Del Norte St

N 40° 47.570'
W 124° 11.238'

S-8 Log inlet sed sample

11:55 collected 6" of mud in core

Sampled rivulet flowing at 5 gpm



Pore Water — Surface Water

	14.47	°C
non-existant/ not extractable	1.84	mS/cm
	14.35	mg/L
	6.49	pH
	3062	ORP

feature: mud with shell fragments

color: black

Exhibit C

State of California - Health and Human Services Agency
Department of Health Services

California
Department of
Health Services

SANDRA SHEWRY
Director

ARNOLD SCHWARZENEGGER
Governor

March 3, 2006

Mary Middleton, Senior Biologist
Pacific Shellfish Institute
20 State Ave. NE #142
Olympia, WA 9850

Dear Ms. Middleton:

Thank you for your request for information regarding the potential impact of dioxin on shellfish harvested from Humboldt Bay, California. The delay in response was due to locating data previously maintained by staff that have since retired.

As you are aware, dioxin studies were conducted in Humboldt Bay by Environ on behalf of Sierra Pacific Industries in 2002. These studies provided some baseline data regarding the potential impact of dioxins in shellfish from the area. Subsequent to the Environ study, the California Department of Health Services (CDHS) conducted, sampling and analysis of shellfish harvested from Humboldt Bay. The samples consisted of aquacultured oysters (Pacific and Kumomoto varieties) and clams (Manila), aquacultured mussels, wild clams (Gaper and Washington varieties), and Humboldt Bay sediment obtained during the week of April 15, 2003. The samples were intended to represent the potential impact of dioxins on aquacultured shellfish in contact with sediment and those utilizing long-line, and/or rack and bag growing methods.

Thirty-four shellfish and fourteen sediment samples were submitted to laboratories of the US Food and Drug Administration (FDA) for dioxin analysis. The FDA reported toxic equivalence levels in shellfish ranging from 0.000 to 0.170 parts per trillion (Table 1).

Should you have any additional questions or concerns, please feel free to contact me at (916) 650-6500.

Sincerely,

Michael F. Hernandez
Food and Drug Branch

TABLE 1
California Department of Health Services
Dioxins in Molluscan Shellfish[1]
Humboldt Bay Sampling
April 15 – 18, 2003

SHELLFISH				SEDIMENT	
Sample Area	Sample	Total Toxic Equivalence (parts per trillion)		Sample Area	Total Toxic Equivalence (parts per trillion)
E	Pacific Oyster	0.000		C	0.000
SB[2]	Wild Clam	0.000		A	0.000
SB	Wild Clam	0.000		E	0.000
NB[3]	Wild Clam	0.000		SB	0.000
NB	Wild Clam	0.000		B	0.000
NB	Wild Clam	0.000		B	0.000
D	Mussel	0.000		C	0.000
C	Pacific Oyster	0.003		C	0.001
B	Pacific Oyster	0.003		B	0.001
C	Pacific Oyster	0.004		B	0.002
C	Pacific Oyster	0.004		B	0.003
B	Pacific Oyster	0.004		A	0.004
B	Kumomoto	0.004		NB	0.059
SB	Wild Clam	0.004		C	0.550
C	Pacific Oyster	0.005			
B	Pacific Oyster	0.006			
C	Clam	0.007			
A	Pacific Oyster	0.010			
E	Pacific Oyster	0.010			
E	Pacific Oyster	0.020			
B	Kumomoto	0.024			
C	Pacific Oyster	0.027			
A	Kumomoto	0.028			
C	Pacific Oyster	0.028			
B	Kumomoto	0.029			
B	Pacific Oyster	0.030			
B	Pacific Oyster	0.031			
B	Pacific Oyster	0.037			
B	Pacific Oyster	0.039			
B	Pacific Oyster	0.039			
B	Pacific Oyster	0.043			
C	Pacific Oyster	0.070			
A	Pacific Oyster	0.150			
A	Pacific Oyster	0.170			

[1] Dioxin analyses were conducted by the U.S. Food and Drug Administration.
[2] SB = South Bay
[3] NB = North Bay

MAP 1
Humboldt Bay Shellfish Harvest Locations