

ARCADIS

Appendix G

Dioxin Profiles

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Acronyms and Abbreviations

bss	below sediment surface
CalEPA	California Environmental Protection Agency
CCME	Canadian Council of Ministers of the Environment
CHHSL	California Human Health Screening Level
Dioxin Report	Determination of Site-Specific PCDD/PCDF Background Soil Concentrations at a Former Sawmill Site
dioxins	polychlorinated dibenzo- <i>p</i> -dioxins
DTSC	California Department of Toxic Substances Control
furans	polychlorinated dibenzofurans
HpCDD	1,2,3,4,6,7,8- heptachlorodibenzo- <i>p</i> -dioxin
HpCDF	1,2,3,4,6,7,8- heptachlorodibenzofuran
OCDD	octachlorodibenzo- <i>p</i> -dioxin
OCDF	octachlorodibenzofuran
OU-E	Operable Unit E
PCDD	polychlorinated dibenzodioxins
PCDF	polychlorinated dibenzofurans
PCP	pentachlorophenol
PSL	preferred screening level
pg/g	picograms per gram
RI	Remedial Investigation
site	Former Georgia-Pacific Wood Products Facility in Fort Bragg, California
TCDD	2,3,7,8- tetrachlorodibenzo- <i>p</i> -dioxin
TCDF	2,3,7,8-tetrachlorodibenzofuran
TEQ	toxic equivalent
USEPA	United States Environmental Protection Agency

Introduction to OU-E Dioxin Congener Profiles and Source Classification Approach

The source of polychlorinated dibenzo-*p*-dioxins (dioxins) and polychlorinated dibenzofurans (furans) in Operable Unit E (OU-E) soils and sediments was evaluated by generating congener profiles (histograms) for historical and Remedial Investigation (RI) soil and sediment samples. The congener profiles were then assigned to a source category using the semi-quantitative approach described below.

This approach is largely consistent with the approach that was applied to soils and sediments at the former Georgia-Pacific Wood Products Facility in Fort Bragg, California (site) to identify the significant anthropogenic sources of dioxin/furans in soils and sediments for the site and determine a site-specific ambient concentration of dioxins and furans on a toxic equivalent (TEQ) basis. However, because California Environmental Protection Agency (CalEPA), Department of Toxic Substances Control (DTSC) and Georgia-Pacific LLC were not able to agree on an acceptable methodology for establishing a specific background value for dioxins/furans at the site, the classifications and methodology presented below will be used solely to better understand potential sources of dioxin/furans at the site. The classifications will not be used to eliminate data points from the risk assessment and are included here as part of a weight-of-evidence approach that also includes a traditional risk assessment when making risk management decisions and selecting a remedial goal for dioxin/furans.

Identification of Preferred Screening Levels

In the *Determination of Site-Specific PCDD/PCDF Background Soil Concentrations at a Former Sawmill Site* (Dioxin Report; ARCADIS, 2008), only samples related to one of the three potential onsite dioxin/furan sources (ambient soil, redwood bark ash, and municipal wood ash) were classified. Mixtures were not classified. Classifications for mixtures are identified herein to fully characterize all dioxin/furan samples within OU-E. For simplicity, only samples that exceeded either the human health or ecological 2,3,7,8-TCDD TEQ preferred screening levels (PSLs) were classified. The PSLs are as follows:

- The human health soil and sediment PSL is 4.6 picograms per gram (pg/g), based on the residential California Human Health Screening Level (CHSSL; CalEPA, 2005).

- The ecological soil PSL is 4.0 pg/g based on the Canadian Environmental Quality Guidelines for Residential Soil (Canadian Council of Ministers of the Environment [CCME], 1999).
- The ecological sediment PSL is 21.5 pg/g based on Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CCME, 2001).

See Appendix D *Screening Levels* for a discussion of how PSLs were selected.

Identification of Congener Profiles

Sample histograms were generated by plotting each 2,3,7,8-substituted congener as a proportion of the sum of all seventeen 2,3,7,8-substituted congeners. Non-detected congeners were not plotted. Data tables are included in Appendix E. The histograms for the OU-E soil and sediment samples are presented in Attachments G-1 through G-6. Sample histograms were compared to congener profiles for the three source categories characterized in literature likely to occur in onsite soils and sediments: ambient background, natural wood ash, and waste wood ash. Example profiles for these sources are presented in Attachment G-7.

Congener profiles for ambient soils across the United States were obtained from the United States Environmental Protection Agency publications (USEPA, 2001; 2004). Specifically, dioxins and furans in ambient soil are characterized by a large proportion (typically greater than 80%) of octachlorodibenzo-*p*-dioxin (OCDD), with lesser contributions from three congeners: 1,2,3,4,6,7,8- heptachlorodibenzo-*p*-dioxin (HpCDD), octachlorodibenzofuran (OCDF), and 1,2,3,4,6,7,8- heptachlorodibenzofuran (HpCDF) (USEPA, 2001; 2004).

Burning of natural wood produces a similar congener profile to ambient dioxins/furans, except that small proportions (typically less than 5%) of additional congeners are also found in natural wood ash (Oehme and Muller, 1995). The natural wood ash profile was considered representative of profiles that would be produced by the incineration of redwood bark at the site. Oehme and Muller (1995) also present congener profiles for waste wood ash. These profiles are characterized by a relatively even distribution of most dioxin/furan congeners, including tetra-, penta-, hexa-, and hepta-chlorinated dioxins and furans, with significant contributions from most congeners, especially pentachlorodibenzofurans, hexachlorodibenzofurans, and 2,3,7,8-tetrachlorodibenzofuran (TCDF). Municipal wood incineration is expected to produce dioxin/furans with a similar congener distribution to that found in waste wood ash.

Soil Sample Classification Criteria

Examples of the source profiles for ambient soil, natural wood ash, and waste wood ash presented in the publications referenced above are presented in Attachment G-7 of this appendix. These source profiles from the literature were used to generate the following general criteria to classify site soil samples as consistent with the one of the three known dioxin/furan sources:

- Ambient
 - Four dominant congeners present (OCDD; OCDF; 1,2,3,4,6,7,8-HpCDD; and 1,2,3,4,6,7,8-HpCDF)
 - Presence of OCDD (• 60%)
 - General absence of tetra-, penta-, and hexa-chlorinated congeners (• 1%)

- Bark
 - Two dominant congeners present (OCDD and 1,2,3,4,6,7,8-HpCDD)
 - Presence of OCDD (• 60%) and some penta-, hexa-, and/or hepta-chlorinated congeners (• 1%)
 - Absence of tetra-chlorinated congeners (• 1%)

- Municipal Wood
 - Presence of 2,3,7,8-TCDF (• 5%)
 - Relatively low proportion of OCDD (much less than 60%)
 - Presence of multiple tetra-, penta-, hexa-, and/or hepta-chlorinated congeners (• 1.5%)

The criteria listed above are consistent with those used in the Dioxin Report (ARCADIS, 2008). As in that report, a weight-of-evidence approach and best professional judgment were used to assign samples to a category in the cases where there were slight exceptions to these criteria, and samples were assigned to a source category only if the sample congener profile was clearly consistent with one of the three literature source profiles. Remaining samples were classified as a mixture if the profile contained characteristics of multiple sources. Ambiguous samples were not classified. Any additional sources of dioxins/furans in onsite soils and sediments, such as pentachlorophenol (PCP) or stormwater from offsite locations were not formally evaluated. These are inherently included in ambiguous samples consisting of a mixture of sources.

Dioxin/Furan Source Classification by Area

Results of the OU-E soil and sediments dioxin/furan source classification for each area within OU-E as defined in the nature and extent discussion of the RI are presented below:

- Future Terrestrial Area Soils and Sediments

In the future terrestrial area, five out of ten soil and 38 out of 45 sediment samples exceeded 2,3,7,8-TCDD TEQ PSLs and were classified based on visual inspection of their profiles (refer to Attachments G-1 and G-2).

Four of the five soil samples were consistent with the ambient source profile. The remaining fifth soil sample was not consistent with a single source profile and was classified as a mixture of ambient soil, waste wood ash, and/or natural wood ash. The classifications of the future terrestrial area soil samples are summarized in Table 1 of Attachment G-1.

In the future terrestrial area sediments (Pond 8 East and West), 27 of the 38 classified samples were consistent with the ambient source profile; 18 from Pond 8 East and 9 from Pond 8 West. Two samples, one in Pond 8 East and one in Pond 8 West, had profiles consistent with natural wood ash and one sample, DP-5.61 (0-0.5 feet below sediment surface [bss]), was not consistent with any source profile and was classified as no category. The remaining eight samples, one from Pond 8 East and seven from Pond 8 West, were not consistent with a single source profile and were classified as mixtures. The classifications of the future terrestrial area sediment samples are summarized in Table 1 of Attachment G-2.

- Future Wetland Area Soils and Sediments

In the future wetland area, 26 out of 71 soil and 21 out of 27 sediment samples exceeded 2,3,7,8-TCDD TEQ PSLs and were classified based on visual inspection of their profiles (refer to Attachments G-3 and G-4, respectively). In soil, 15 of the 26 classified samples were consistent with a source profile; seven were consistent with ambient soil, and eight were consistent with waste wood ash. The remaining 11 soil samples were not consistent with a single source profile. Ten were classified as mixtures of either ambient soil, natural wood ash, and/or waste wood ash. The remaining sample was not classified, because the dioxin profile was obscured by a low frequency of detection for the dioxin/furan congeners. The

classifications of the future wetland area soil samples are summarized in Table 1 of Attachment G-3.

In the future wetland area sediments (North Pond, Pond 6 and Pond 7), 15 of the 21 classified samples were consistent with a source profile. Five of the remaining samples were not consistent with a single source profile and were classified as mixtures. One sample was not classified, due to low frequency of detection of the dioxin/furan congeners. In the North Pond, one of each of the three samples was classified as ambient, waste wood ash, or no category. In Pond 6, one sample was classified as ambient, two as waste wood ash, and four as mixtures. In Pond 7, 11 samples were classified as waste wood ash and a twelfth sample as a mixture of ambient and waste wood ash. The classifications of the future wetland area sediment samples are summarized in Table 1 of Attachment G-4.

- Southern Ponds Sediments

In the Southern Ponds (Ponds 1, 2, 3 and 4), 31 out of 39 sediment samples exceeded 2,3,7,8-TCDD TEQ PSLs and were classified based on visual inspection of their profiles (refer to Attachment G-5). Of the 31 classified samples, 18 were consistent with either ambient (one sample) or waste wood ash profiles (17 samples) and 13 were not consistent with a profile and were considered mixtures. In Pond 1, four out of five samples were classified as having profiles consistent with waste wood ash and one sample was considered a mixture of waste wood ash and other sources. In Pond 2, six of the eight classified samples had profiles consistent with waste wood ash while the remaining two samples were classified as mixtures. In Pond 3, 9 of the 17 samples were classified as mixtures, 7 as waste wood ash and one as ambient. In Pond 4, only one sample exceeded screening levels and was classified. Its profile was not consistent with a source profile and was considered to be a mixture of ambient soil and waste wood ash and/or other sources. The classifications of the Southern Ponds sediment samples are summarized in Table 1 of Attachment G-5.

- Ponds 5 and 9 Sediments

In Ponds 5 and 9, five out of six sediment samples exceeded 2,3,7,8-TCDD TEQ PSLs and were classified based on visual inspection of their profiles; four samples from Pond 5 and one sample from Pond 9 were classified (refer to Attachment G-6). Two of the four samples from Pond 5 and the one sample from Pond 9 were consistent with the ambient source profile. The remaining two samples from Pond

5 were not consistent with a profile and considered to be mixtures of ambient soil and natural wood ash. The classifications of the Ponds 5 and 9 sediment samples are summarized in Table 1 of Attachment G-6.

Outlier Analysis

The soil and sediment ambient datasets were tested for statistical outliers using quartile analysis as recommended by DTSC (CalEPA, 2007) and Rosner's test as recommended by USEPA (2009). The testing is described below. Mammalian TEQ concentrations were tested. Outliers may indicate the presence of multiple populations and the ambient source classification will be removed from those samples.

Sediment Analysis

First, quartile analysis was performed on the sediment ambient dataset (N=33), defined as all currently existing sediment in OU-E. Statistical outliers are defined as all points with concentrations greater than the threshold value, calculated at a value of 247 pg/g, as described in CalEPA (2007). Because the maximum ambient sediment concentration (231 pg/g) was less than the threshold, no statistical outliers were identified in the ambient sediment dataset.

The sediment ambient dataset (n=33) was also tested for outliers using methods recommended by USEPA (2009). Rosner's test ($N \geq 25$) or Dixon's test ($N < 25$) was applied to the dataset using ProUCL v 4.0 software (USEPA, 2009). In this case, Rosner's test was applied to the sediment data classified as related to ambient conditions; samples from all depths were included. At 1% and 5% levels of significance, no statistical outliers were identified in the sediment ambient dataset.

As both methods failed to detect statistical outliers in the ambient sediment dataset, the ambient source classifications applied to these 33 samples were retained.

Soil Analysis

The maximum mammalian TEQ concentration for existing soil in OU-E is 36 pg/g. This concentration is well within the range of background concentrations in soil (USEPA, 2001, 2004) and within the range reported for onsite ambient samples in the Dioxin Report (ARCADIS, 2008), therefore, no statistical evaluation was performed. The ambient source classifications applied to the 31 samples were retained.

References

- ARCADIS. 2008. *Determination of Site-Specific PCDD/PCDF Background Soil Concentrations at a Former Sawmill Site. Former Georgia-Pacific Wood Products Facility*. Draft. Prepared for Georgia-Pacific Corporation. ARCADIS U.S., Inc. October.
- Canadian Council of Ministers of the Environment. 1999. *Canadian soil quality guidelines for the protection of environmental and human health*. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment
- Canadian Council of Ministers of the Environment (CCME). 2001. *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Polychlorinated dioxins and furans (PCDD/Fs)*. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.
- California Environmental Protection Agency (CalEPA). 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. California Environmental Protection Agency. January.
- CalEPA. 2007. *Arsenic Strategies: Development of Arsenic Cleanup Goals for Proposed and Existing School Sites*. Department of Toxic Substance Control. March.
- Oehme, M. and M. Muller. 1995. Levels and congener patterns of polychlorinated dibenzo-*p*-dioxins and dibenzofurans in solid residues from wood-fired boilers: influence of combustion conditions and fuel type. *Chemosphere* 30(8):1527-1539.
- United States Environmental Protection Agency (USEPA). 2001. *Denver Front Range Study, Dioxins in Surface Soil. Study 1: Characterization of Dioxins, Furans and PCBs in Soil Samples Collected from the Denver Front Range Area*. U.S. Environmental Protection Agency, Region 8, Denver, CO.
- USEPA. 2004. *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds*. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

USEPA. 2009. *ProUCL Version 4.00.04 Technical Guide*. Prepared by Lockheed Martin Environmental Services for USEPA Office of Research and Development. EPA/600/R-07/041. February.



Attachment G-1

Future Terrestrial Area Soil Dioxin
Congener Profiles

Tables

Dioxin/Furan Source
Classifications

Attachment G-1
Table 1. Dioxin/Furan Source Classifications
Future Terrestrial Area Soil

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

Location ID	Depth (ft bgs)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
MW-4.6	0 to 0.5 ft	9/28/07	MW-4.6-0-0.5	9.5	20	ambient
MW-4.6*	4 to 4.5 ft	9/28/07	MW-4.6-4-4.5	2.5	4.5	ambient
OUE-HA-029	0 to 1 ft	6/28/10	OUE-HA-029-0-1	5.8	11	ambient
OUE-HA-032	0 to 1 ft	6/28/10	OUE-HA-032-0-1	2.0	5.6	mixture
OUE-SS-002	0 to 0.5 ft	6/30/10	OUE-SS-002-0-0.5	6.3	12	ambient

Notes:

ambient = congener profile consistent with ambient dioxin/furans.

mixture = congener profile consistent with multiple sources of dioxin/furans.

* This sample is consistent with an ambient source of dioxins/furans. It was previously classified as a mixture in the Upland Work Plan.

Acronyms and Abbreviations:

bgs = below ground surface

ft = feet

pg/g = picogram per gram

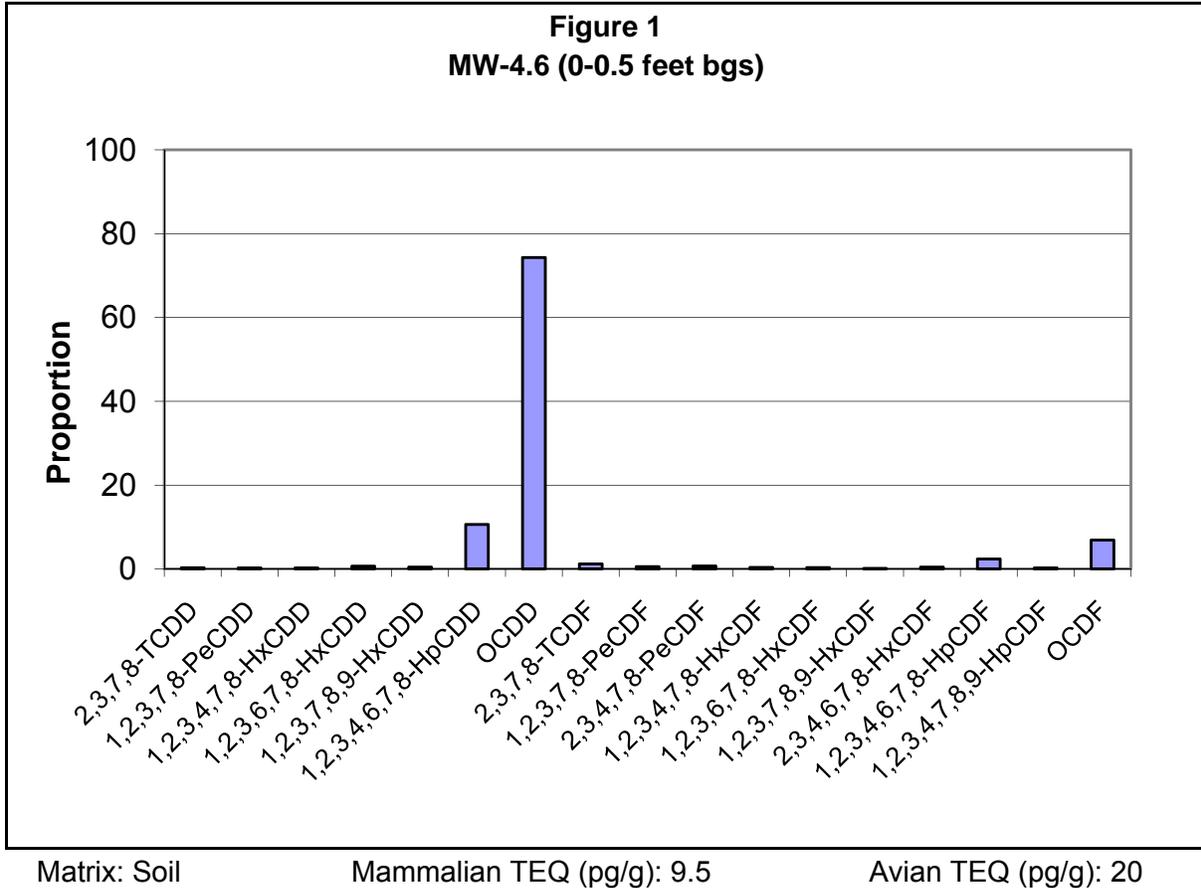
TEQ = toxic equivalent

Figures

Dioxin Congener Profiles

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

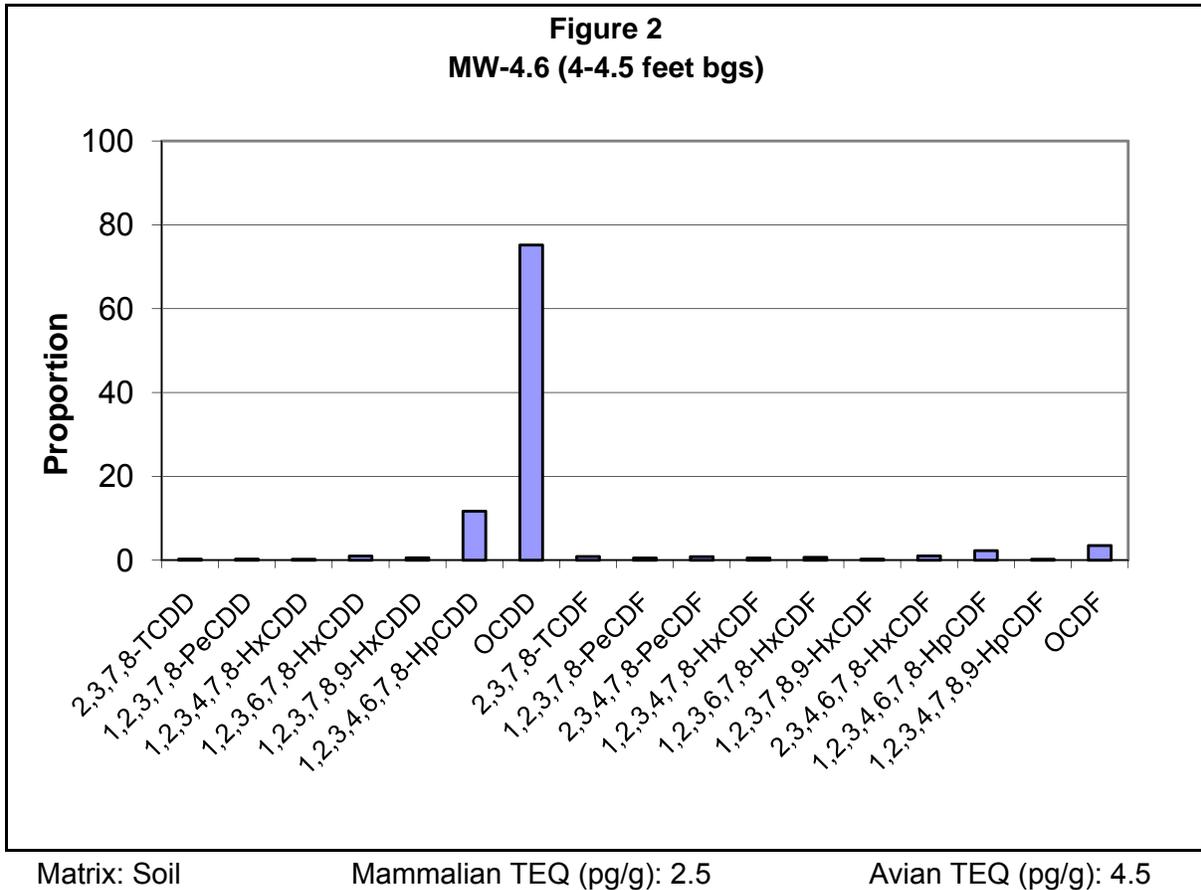


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of 2,3,7,8-TCDF is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

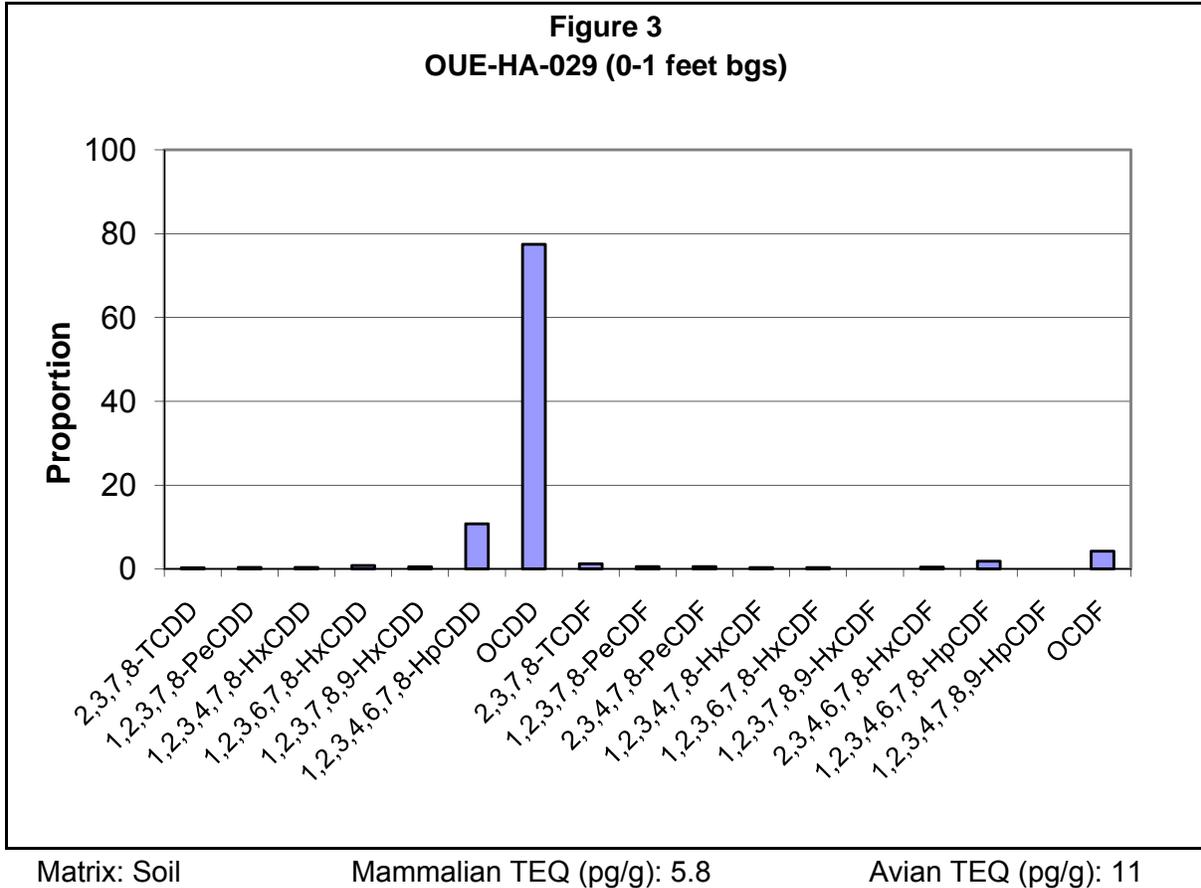


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

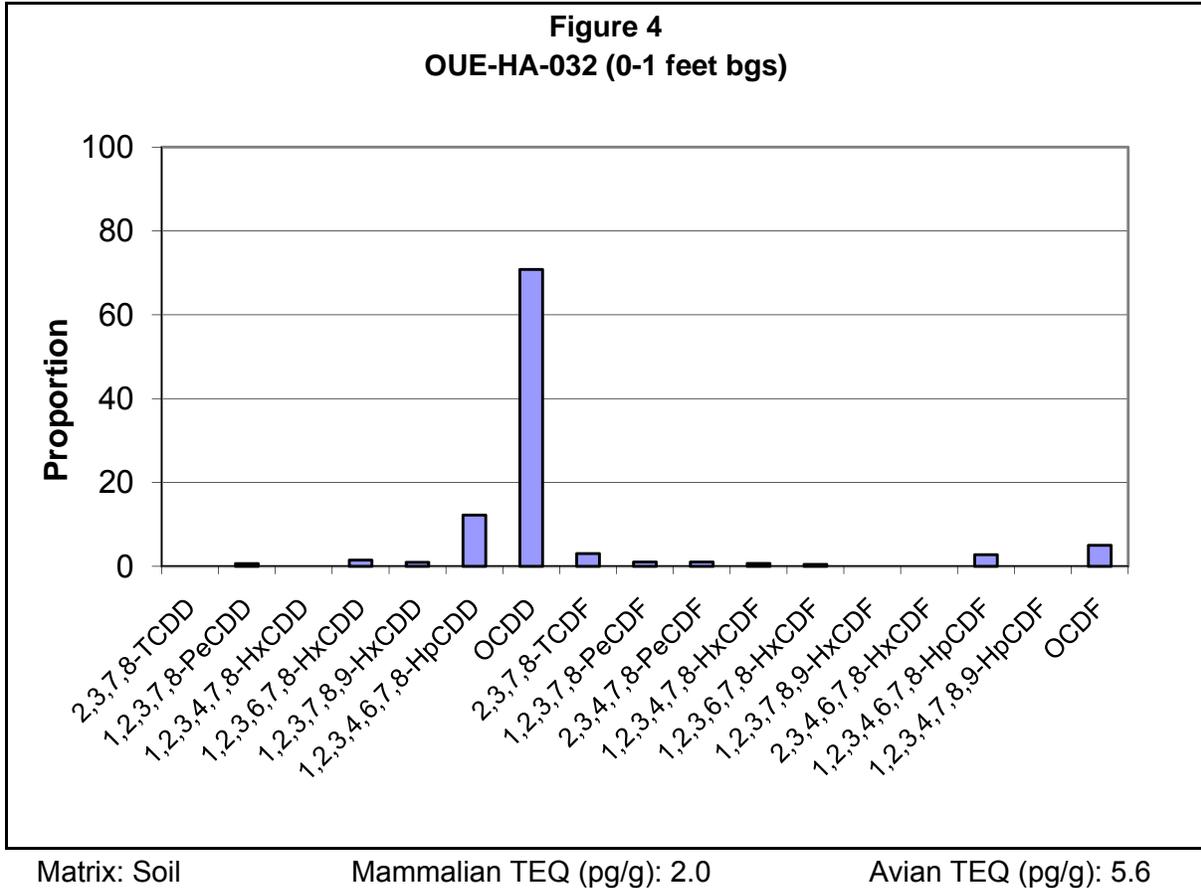


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of 2,3,7,8-TCDF is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

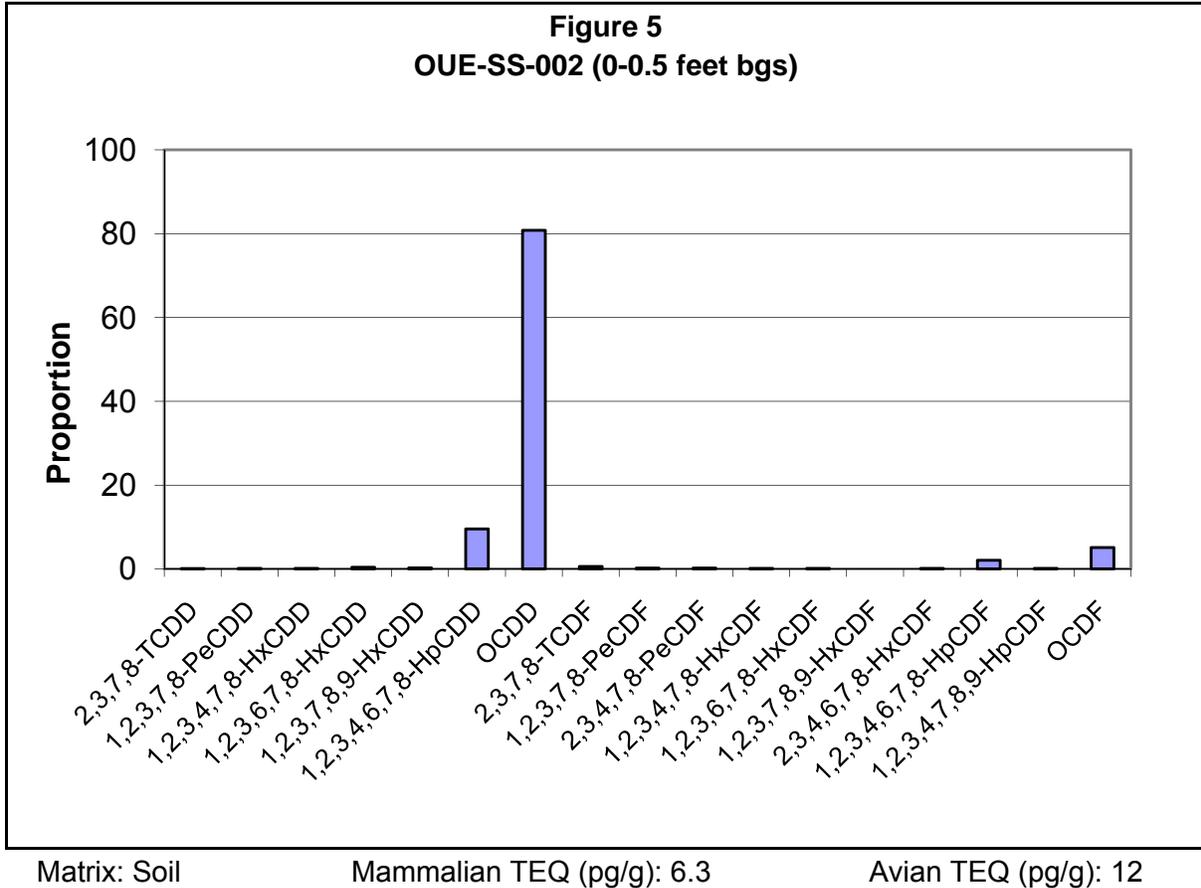


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, bark ash, and/or waste wood ash.

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-1
Dioxin Congener Profiles
Future Terrestrial Area Soils**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bgs = below ground surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

TEQ = toxic equivalent



Attachment G-2

Future Terrestrial Area Sediments
Dioxin Congener Profiles

Tables

Dioxin/Furan Source
Classifications

Attachment G-2
Table 1. Dioxin/Furan Source Classifications
Future Terrestrial Area Sediments

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

Location ID	Depth (ft bss)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
Pond 8 East						
DP-5.61	0 to 0.5 ft	5/26/10	DP-5.61-10	134	362	no category
DP-5.62	0 to 0.5 ft	5/27/10	DP-5.62-4	69	57	ambient
DP-5.62	5 to 5.5 ft	5/28/10	DP-5.62-9	57	61	ambient
Pond8-05	0.5 to 1.5 ft	6/9/10	PD8-05SED-VC-0.5-1.5	123	130	ambient
Pond8-05	1.5 to 2.5 ft	6/10/10	PD8-05SED-VC-1.5-2.5	60	53	ambient
Pond8-05	2.5 to 3.5 ft	6/11/10	PD8-05SED-VC-2.5-3.5	87	67	mixture
Pond8-06	0 to 0.5 ft	6/12/10	PD8-06SED-PD-0-0.5	177	148	ambient
Pond8-06	0.5 to 1.5 ft	6/13/10	PD8-06SED-PC-0.5-1.5	132	108	ambient
Pond8-07	0 to 0.5 ft	6/14/10	PD8-07SED-PD-0-0.5	127	87	ambient
Pond8-07	0.5 to 1.5 ft	6/15/10	PD8-07SED-VC-0.5-1.5	96	74	ambient
Pond8-07	1.5 to 2.5 ft	6/16/10	PD8-07SED-VC-1.5-2.5	84	72	ambient
Pond8-07	2.5 to 3.5 ft	6/17/10	PD8-07SED-VC-2.5-3.5	175	140	ambient
Pond8-07	3.5 to 4.5 ft	6/18/10	PD8-07SED-VC-3.5-4.5	104	84	ambient
Pond8-07	4.5 to 5.5 ft	6/19/10	PD8-07SED-VC-3.5-4.5	203	141	bark
Pond8-08	0 to 0.5 ft	6/20/10	PD8-08SED-PD-0-0.5	152	106	ambient
Pond8-08	0.5 to 1.5 ft	6/21/10	PD8-08SED-VC-0.5-1.5	109	80	ambient
Pond8-08	1.5 to 2.5 ft	6/22/10	PD8-08SED-VC-1.5-2.5	176	155	ambient
Pond8-14	0 to 0.5 ft	6/27/10	Pond8-14-0-0.5	86	80	ambient
Pond8-16	0 to 0.5 ft	6/28/10	Pond8-16-0-0.5	155	138	ambient
Pond8-17	0 to 0.5 ft	6/29/10	Pond8-17-0-0.5	231	200	ambient
Pond8-18	0 to 0.5 ft	6/30/10	Pond8-18-0-0.5	215	155	ambient
Pond 8 West						
DP-4.14	0 to 0.5 ft	5/24/10	DP-4.14-6	20	32	bark
DP-4.15	2 to 2.5 ft	5/25/10	DP-4.15-5	36	32	ambient
Pond8-01	0 to 0.5 ft	5/29/10	PD8-01SED-PD-0-0.5	33	44	ambient
Pond8-01	0.5 to 1.5 ft	5/30/10	PD8-01SED-VC-0.5-1.5	77	201	mixture
Pond8-01	1.5 to 2.5 ft	5/31/10	PD8-01SED-VC-1.5-2.5	66	82	mixture
Pond8-02	0 to 0.5 ft	6/1/10	PD8-02SED-PD-0-0.5	22	44	ambient
Pond8-02	0.5 to 1.5 ft	6/2/10	PD8-02SED-VC-0.5-1.5	46	56	mixture
Pond8-03	0 to 0.5 ft	6/3/10	PD8-03SED-PD-0-0.5	49	115	ambient
Pond8-03	0.5 to 1.5 ft	6/4/10	PD8-03SED-VC-0.5-1.5	79	138	mixture
Pond8-04	0 to 0.5 ft	6/5/10	PD8-04SED-PD-0-0.5	52	77	ambient
Pond8-04	0.5 to 1.5 ft	6/6/10	PD8-04SED-VC-0.5-1.5	44	99	ambient
Pond8-04	1.5 to 2.5 ft	6/7/10	PD8-04SED-VC-1.5-2.5	131	225	mixture
Pond8-04	3.5 to 4.5 ft	6/8/10	PD8-04SED-VC-3.5-4.5	13	14	mixture
Pond8-09	0 to 0.5 ft	6/23/10	Pond8-09-0-0.5	105	203	mixture
Pond8-10	0 to 0.5 ft	6/24/10	Pond8-10-0-0.5	58	70	ambient
Pond8-11	0 to 0.5 ft	6/25/10	Pond8-11-0-0.5	92	136	ambient
Pond8-12	0 to 0.5 ft	6/26/10	Pond8-12-0-0.5	71	131	ambient

Notes:

ambient = congener profile consistent with ambient dioxin/furans.
bark = congener profile consistent with dioxin/furans from bark/natural wood incineration.
mixture = congener profile consistent with multiple sources of dioxin/furans.
no category = profile is ambiguous, sample was not classified.

Acronyms and Abbreviations:

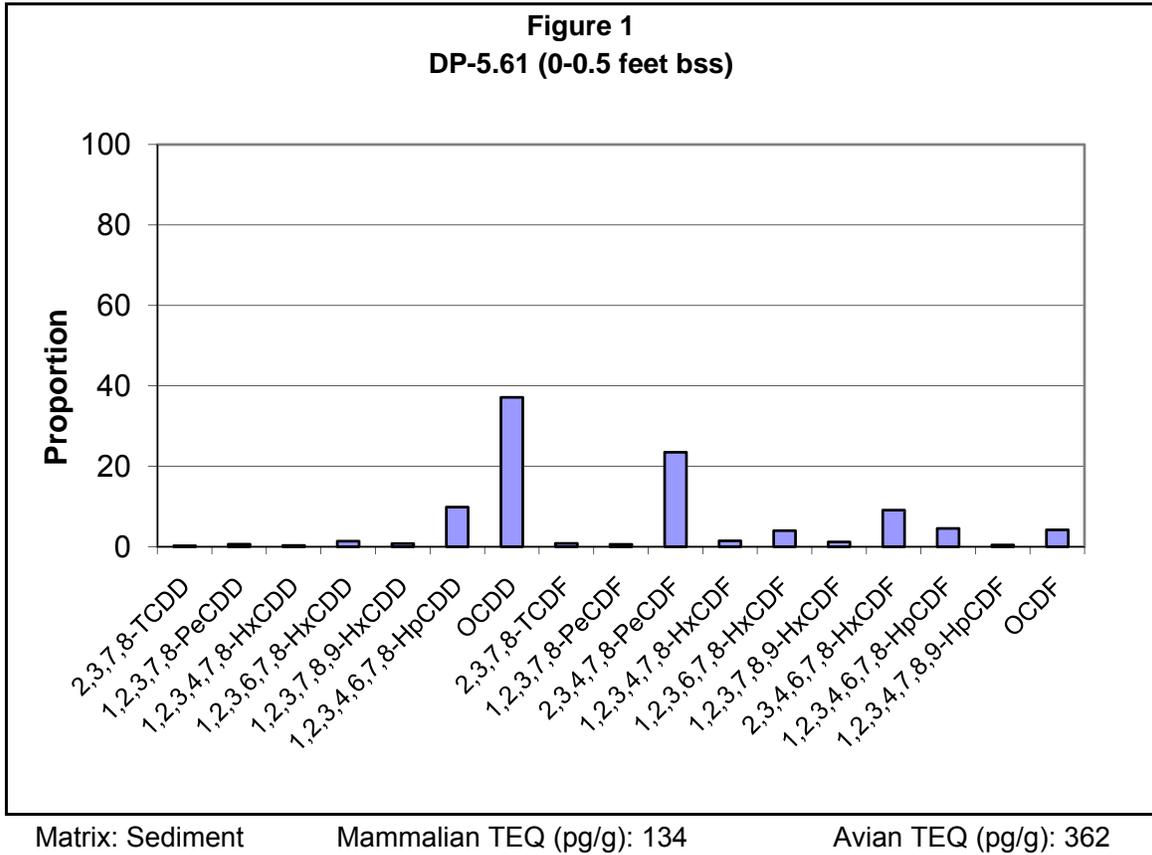
bss = below sediment surface
ft = feet/foot
pg/g = picograms per gram
TEQ = toxic equivalent

Figures – East

Dioxin Congener Profiles:
Future Terrestrial Area Sediments
– Pond 8 East

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

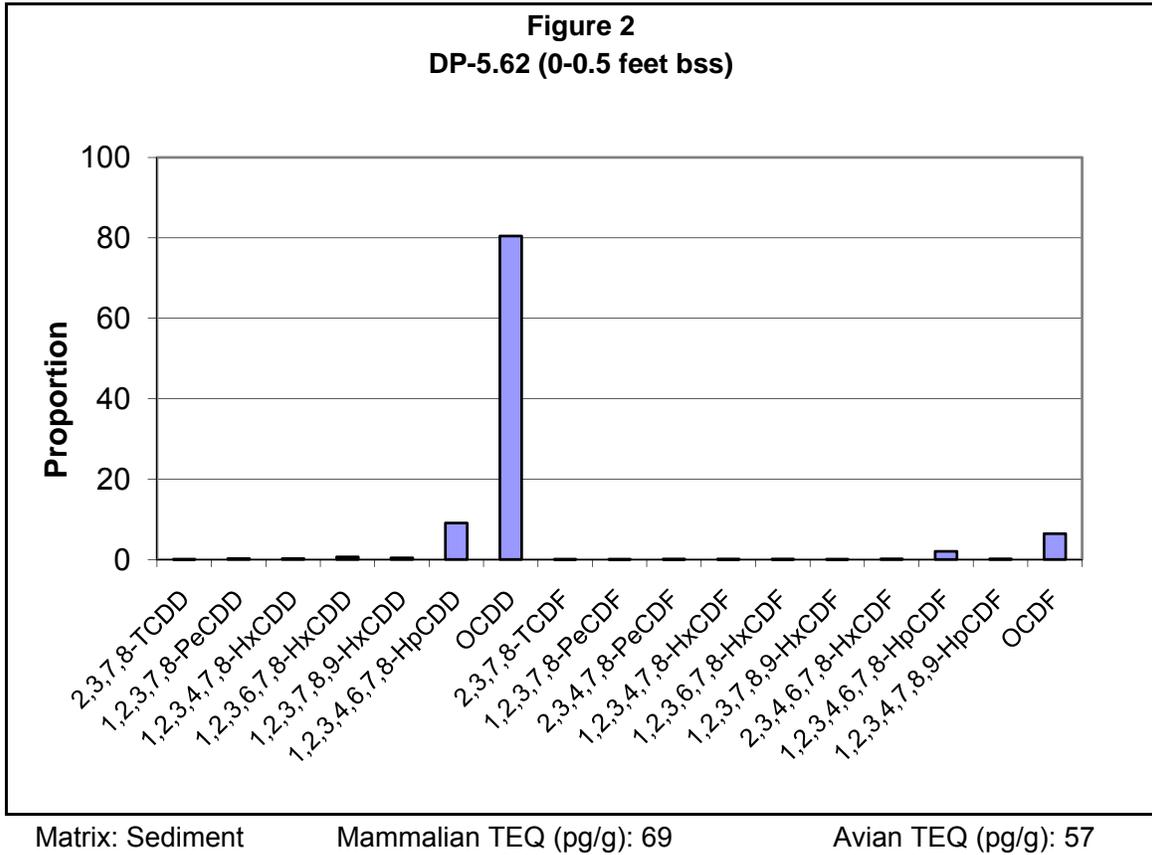
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Category based on visual inspection of dioxin profile: no category
 Inconsistent with any source profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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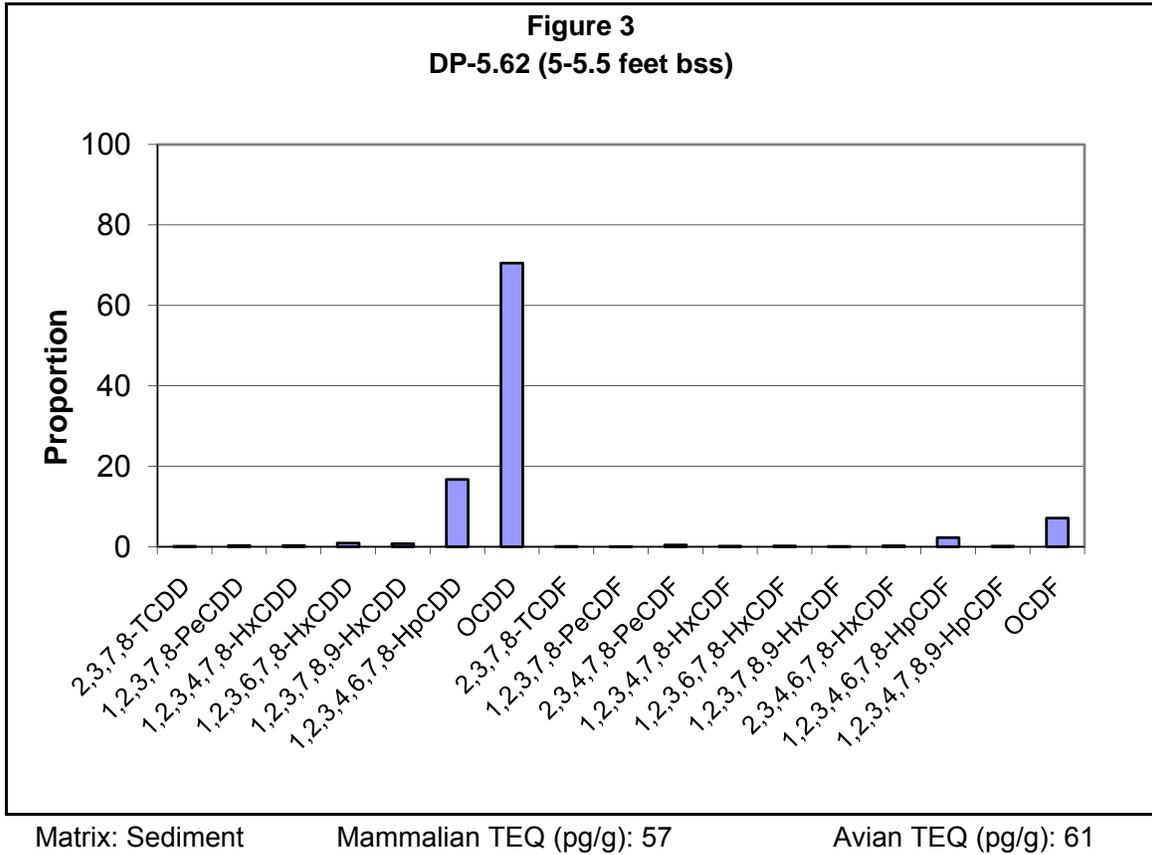


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

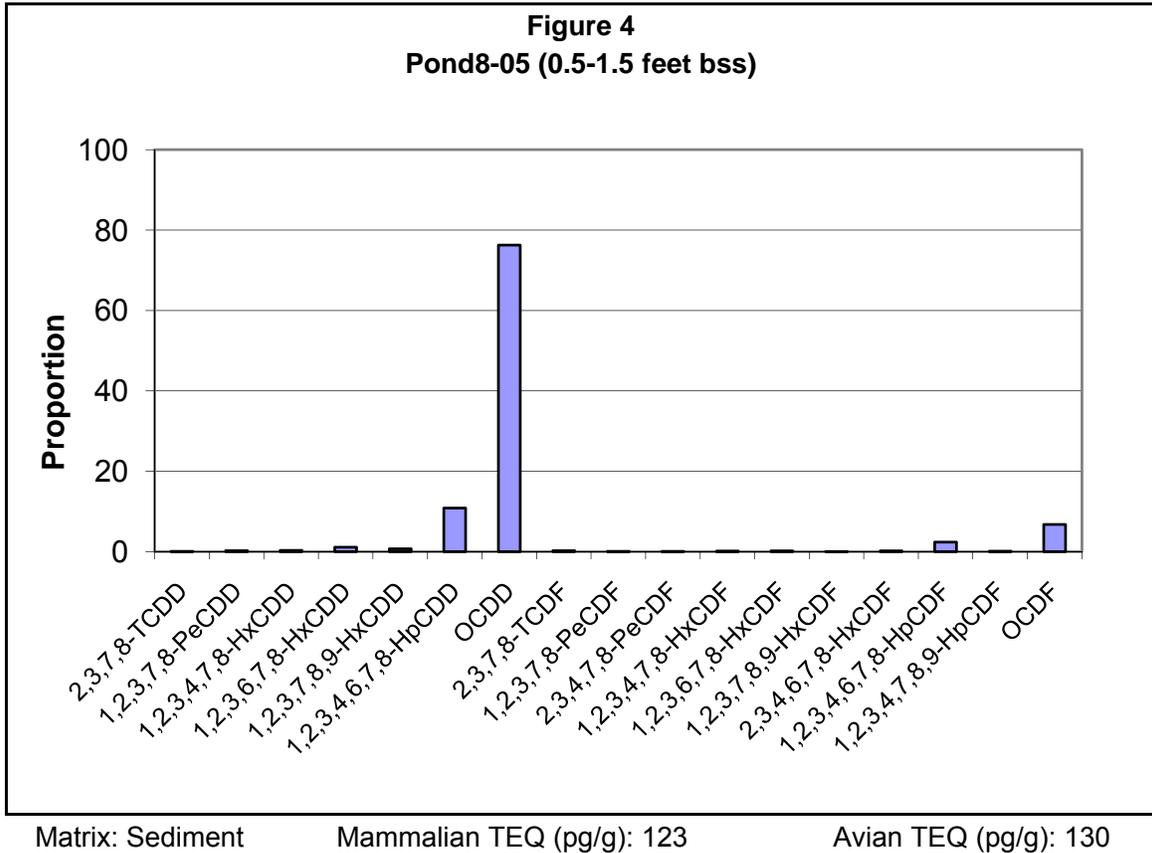


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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Former Georgia-Pacific Wood Products Facility
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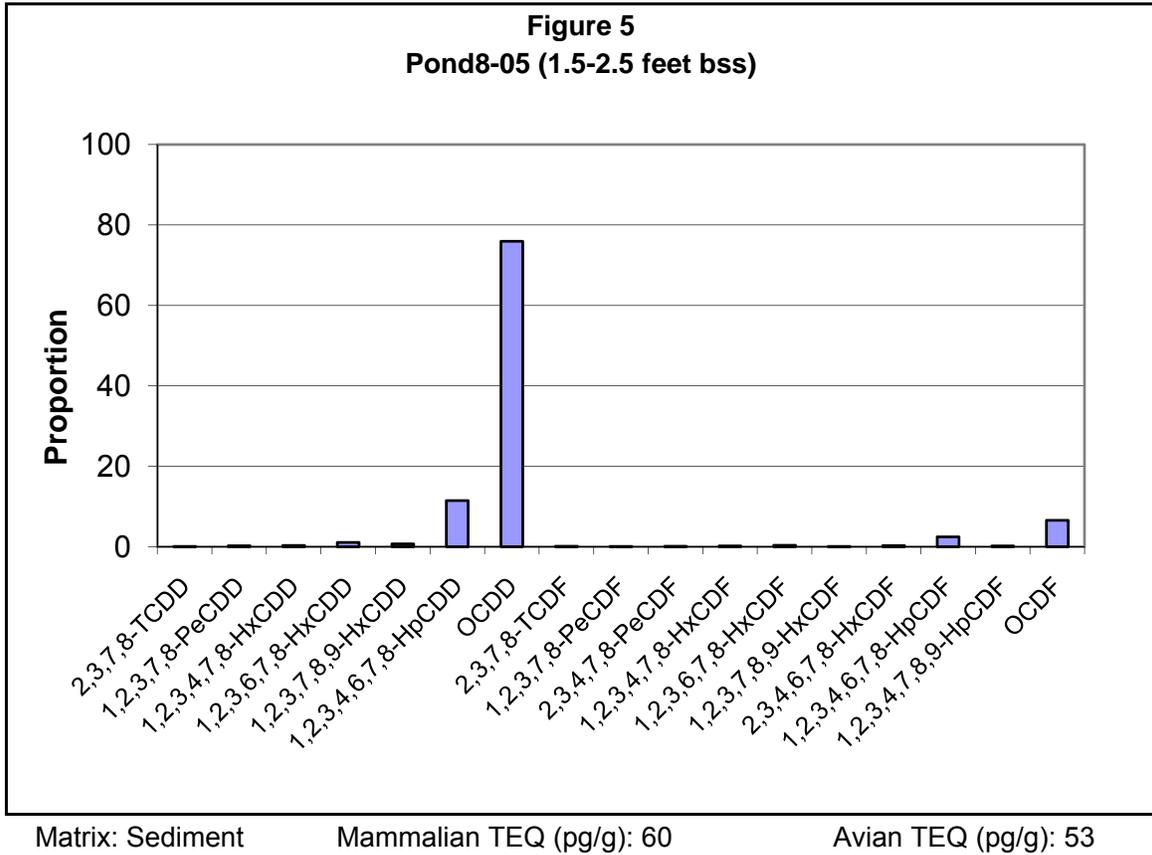


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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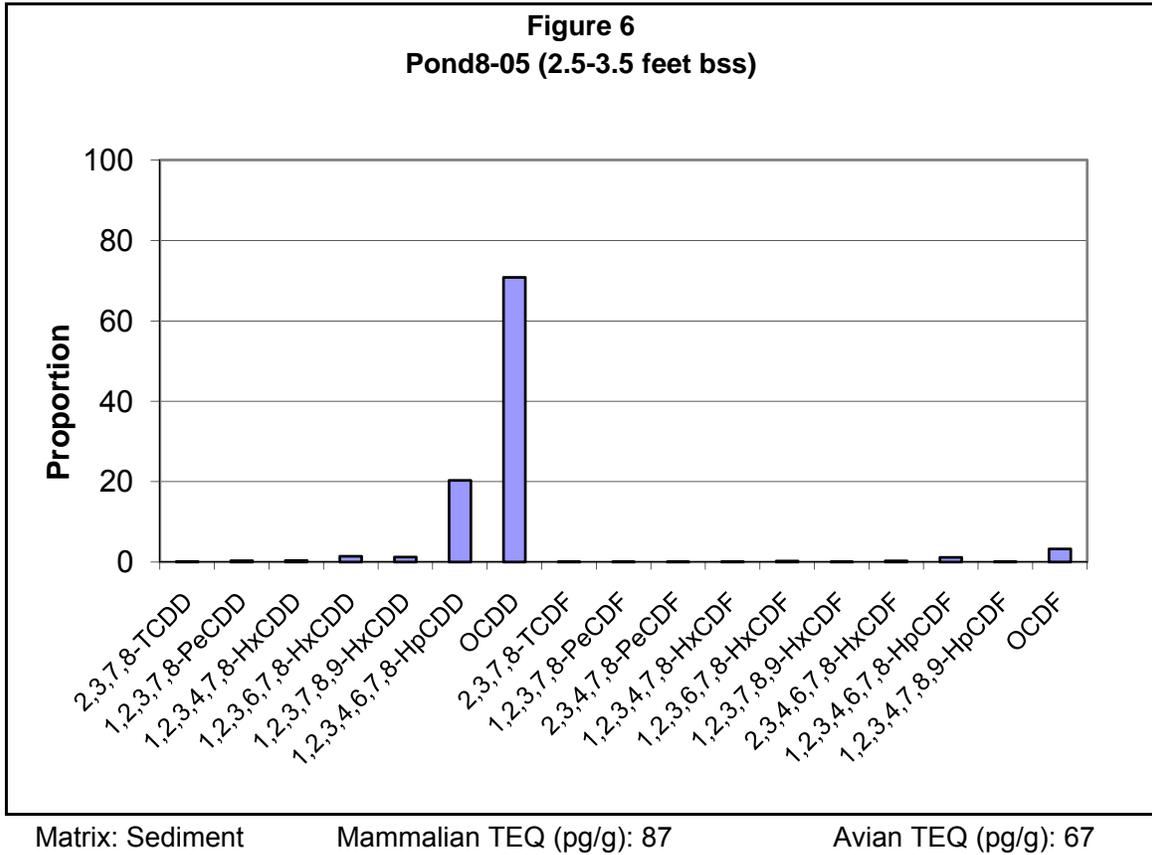


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

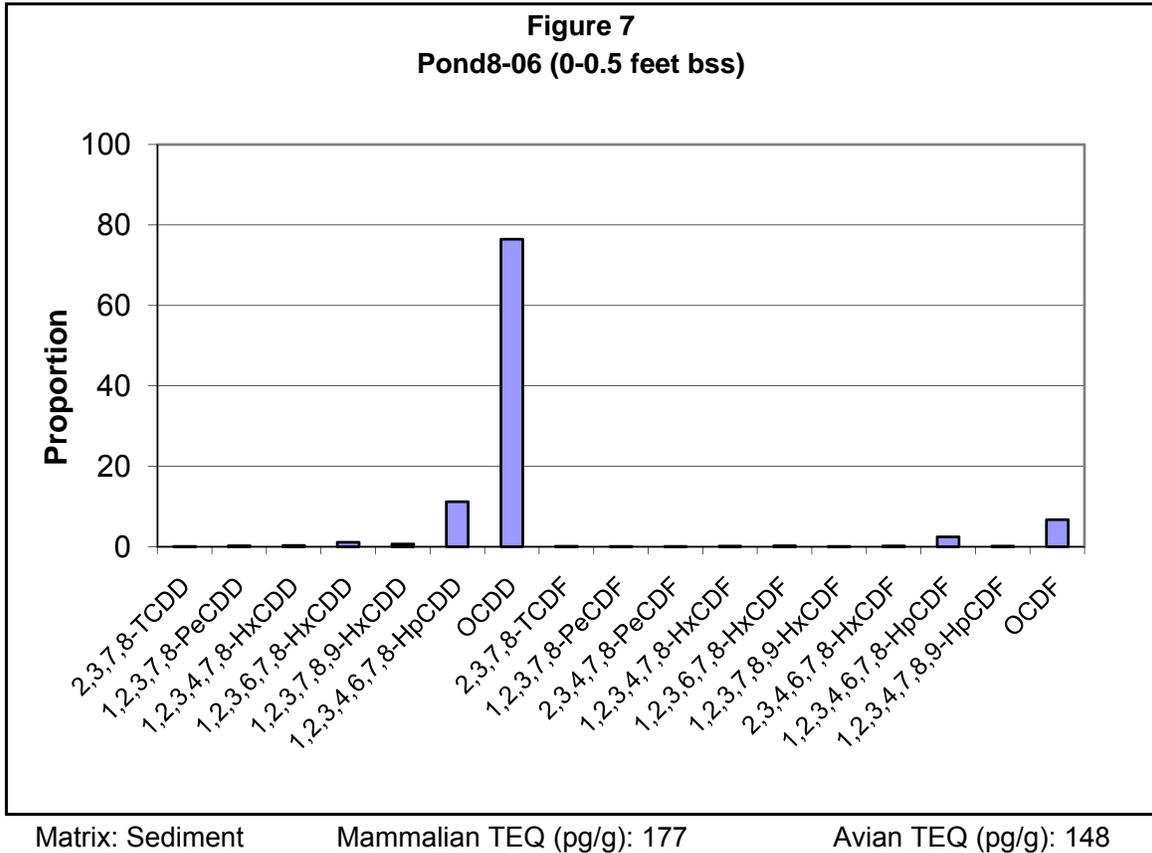


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
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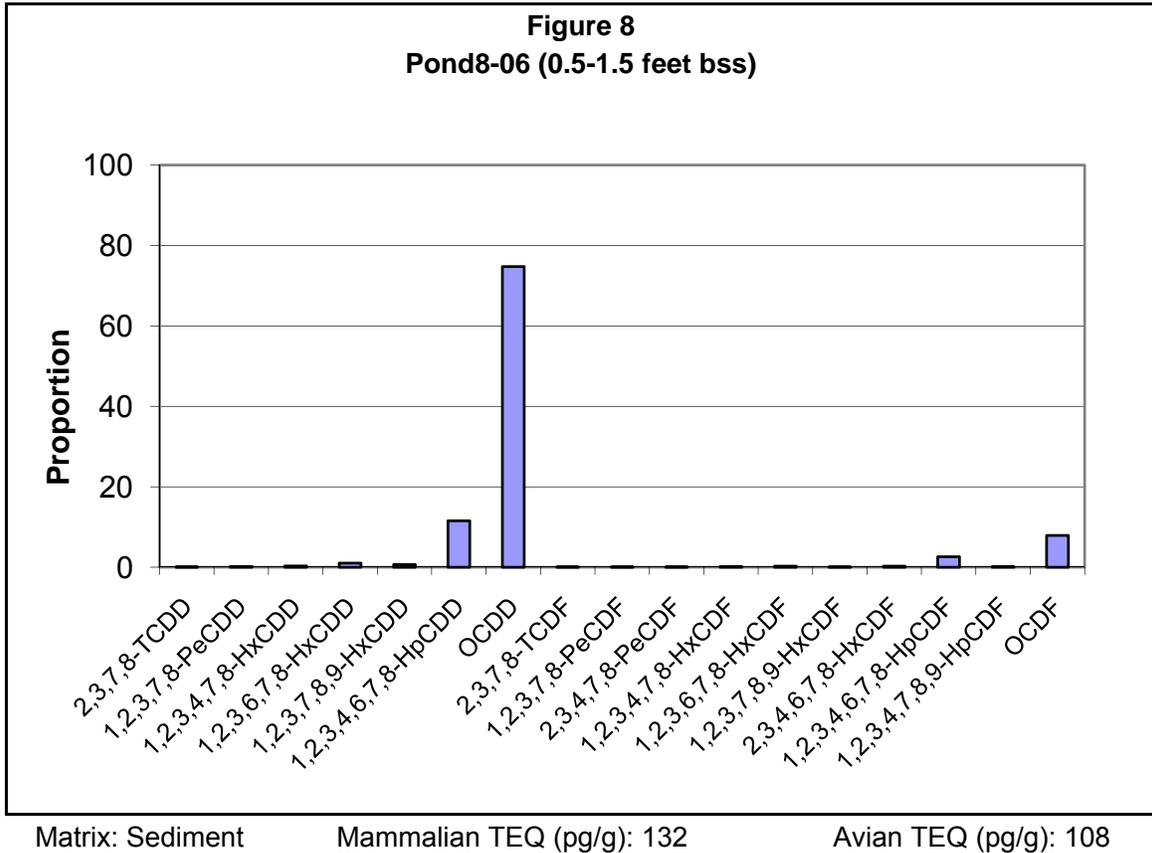


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
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Fort Bragg, California

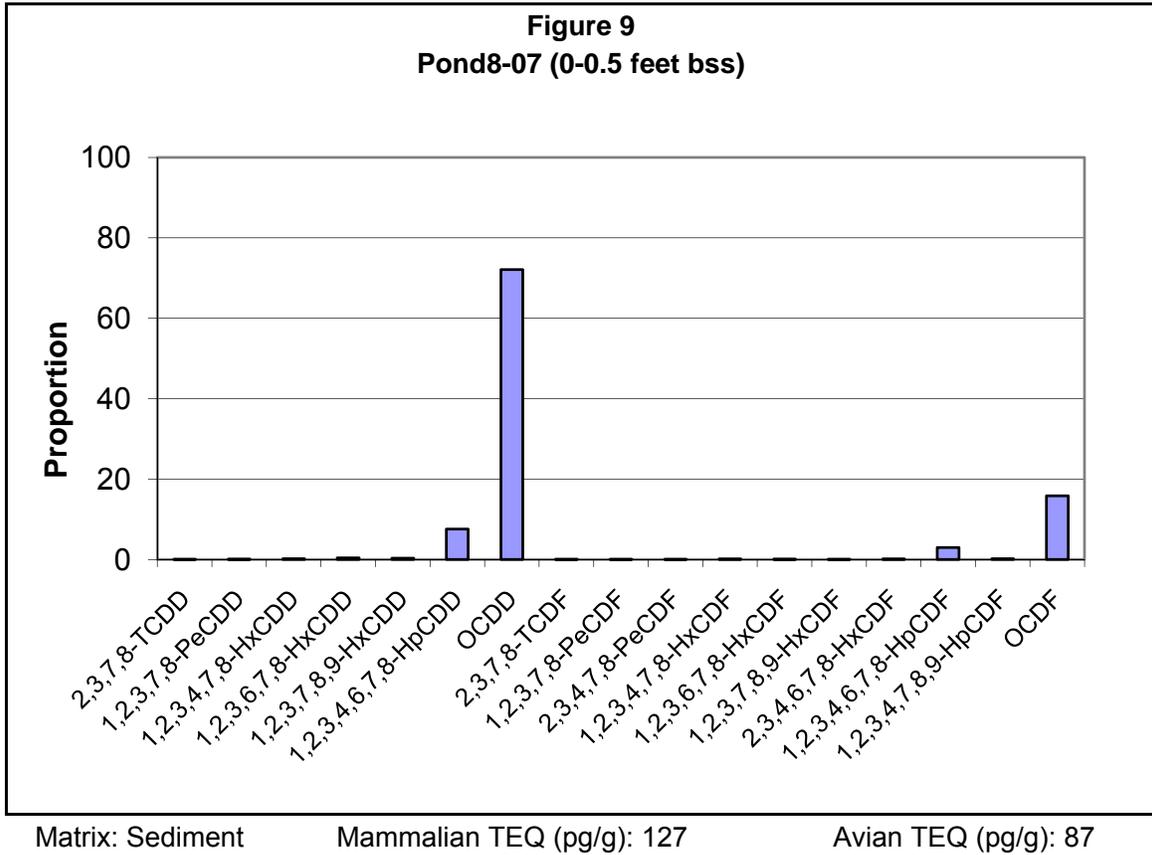


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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Fort Bragg, California

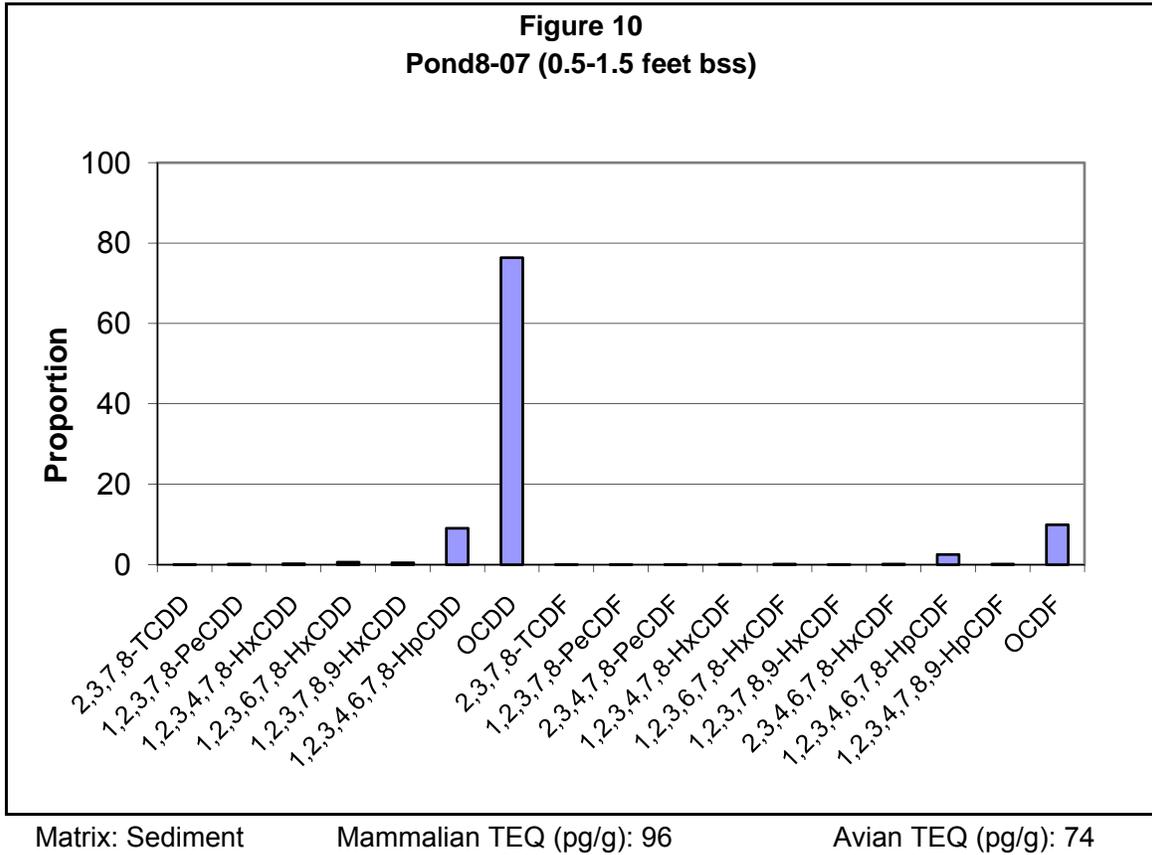


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

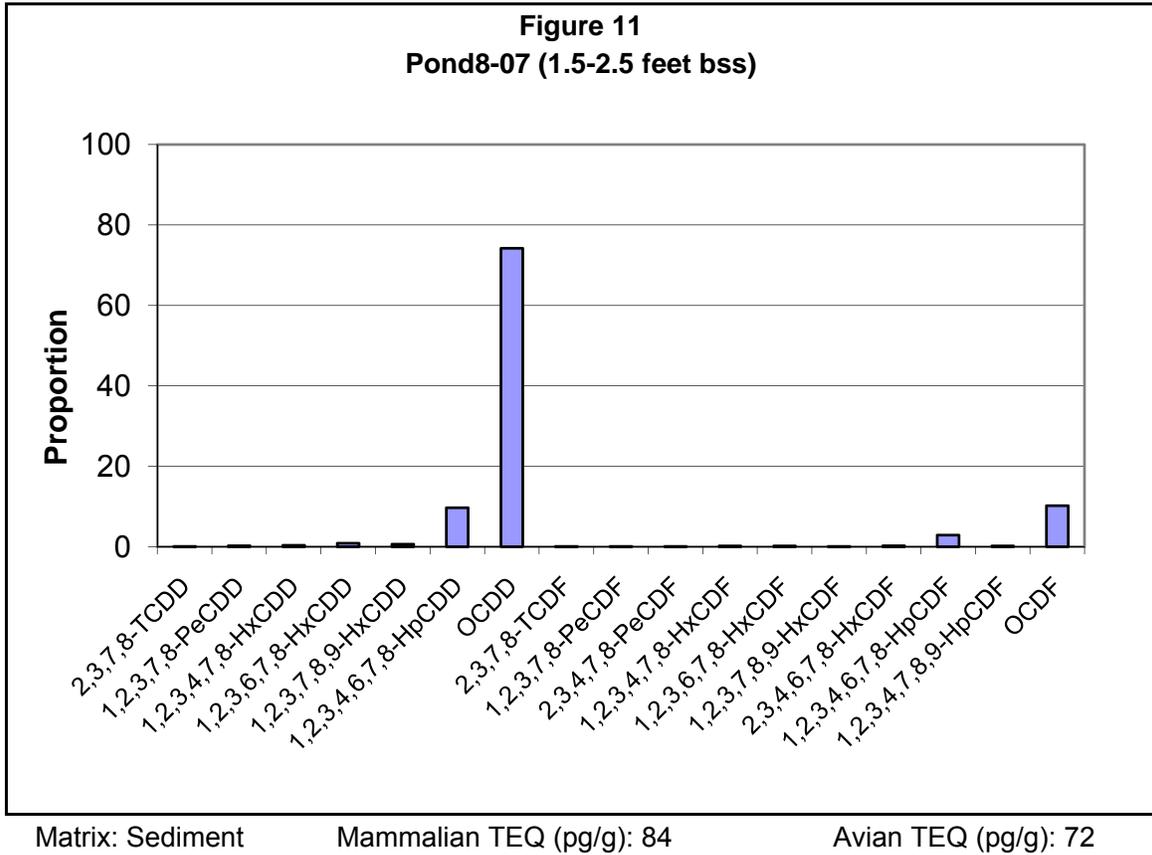


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

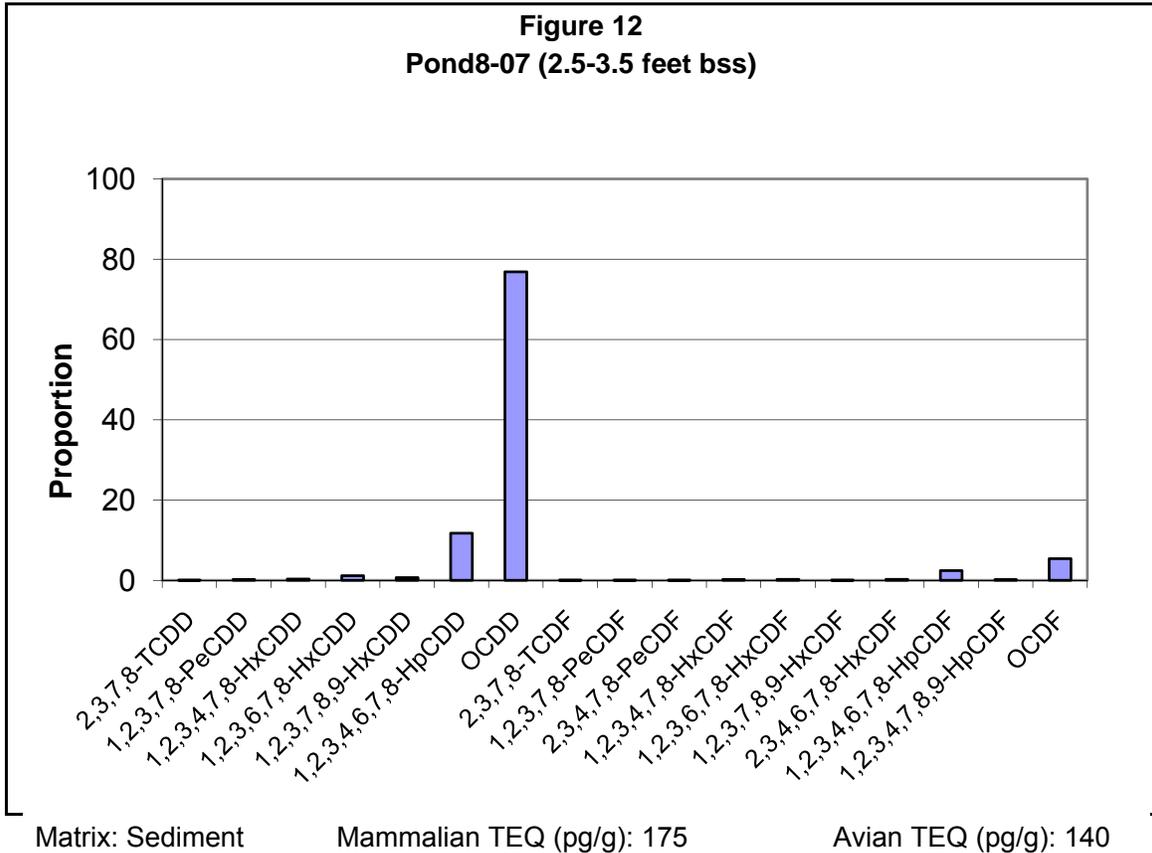


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

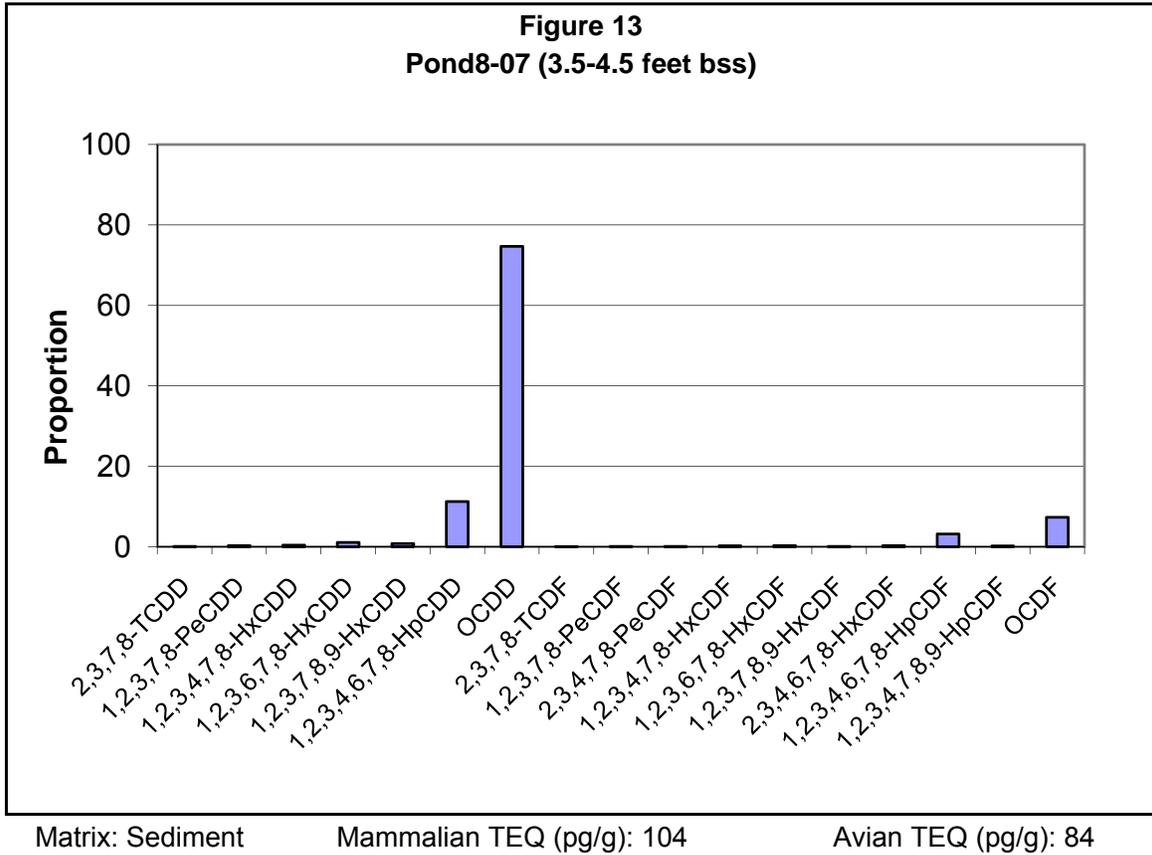


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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Fort Bragg, California

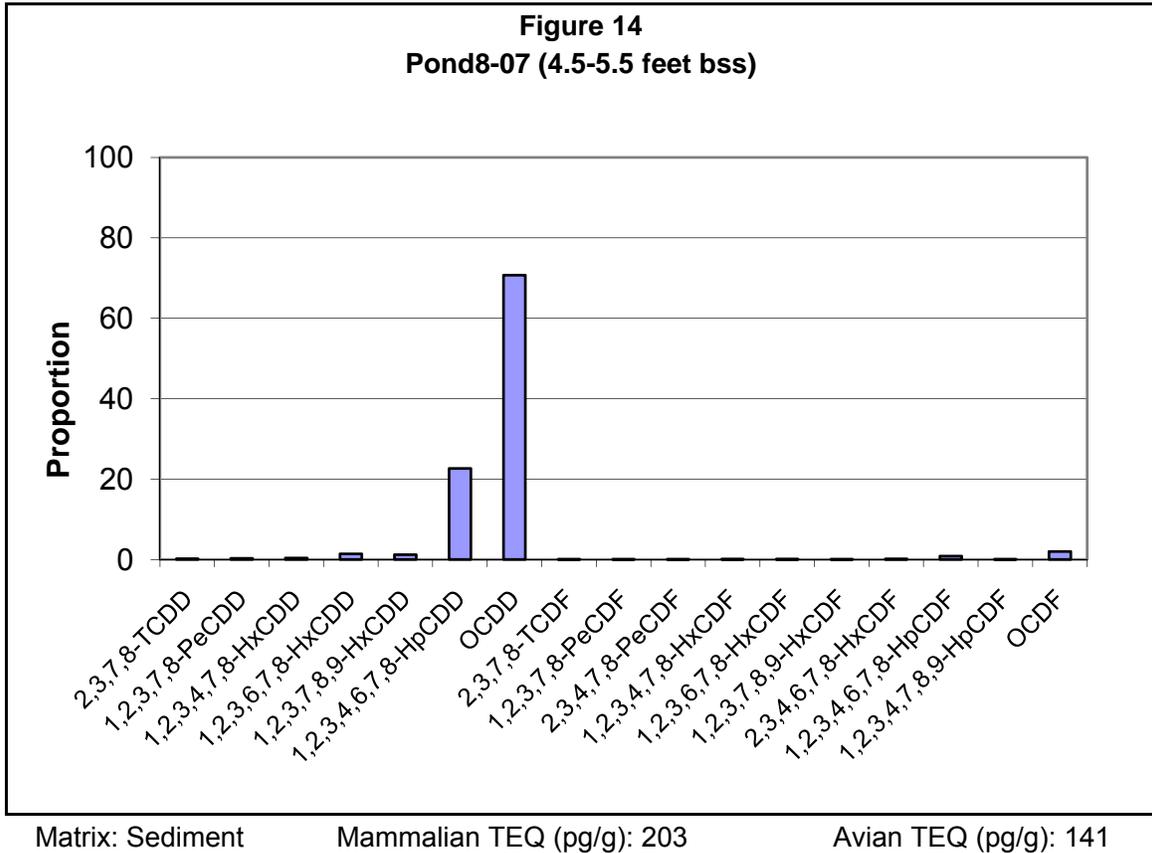


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

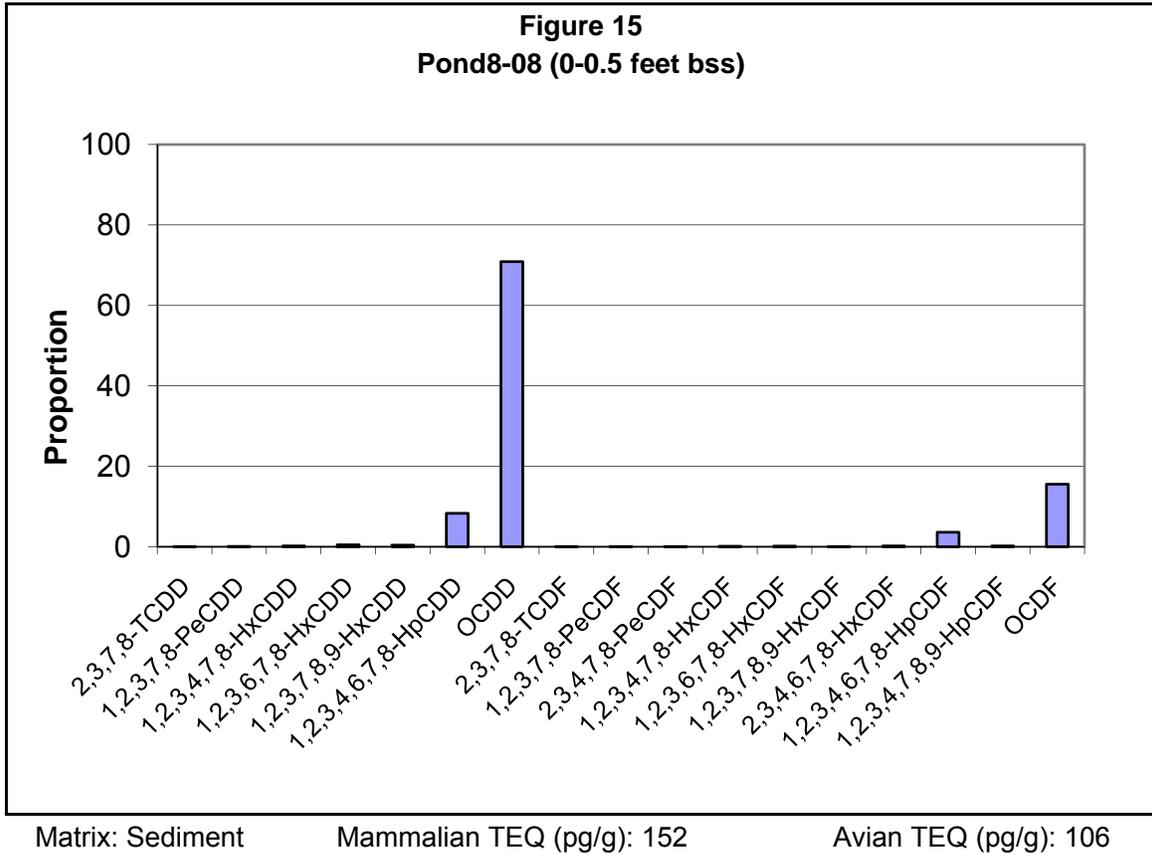


Category based on visual inspection of dioxin profile: bark

Consistent with natural wood ash because: two dominant congeners present (OCDD and 1,2,3,4,6,7,8-HpCDD); presence of OCDD ($\geq 60\%$); presence of some penta-, hexa-, and/or hepta-chlorinated congeners ($\geq 1\%$); general absence of tetra-chlorinated congeners ($\leq 1\%$).

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
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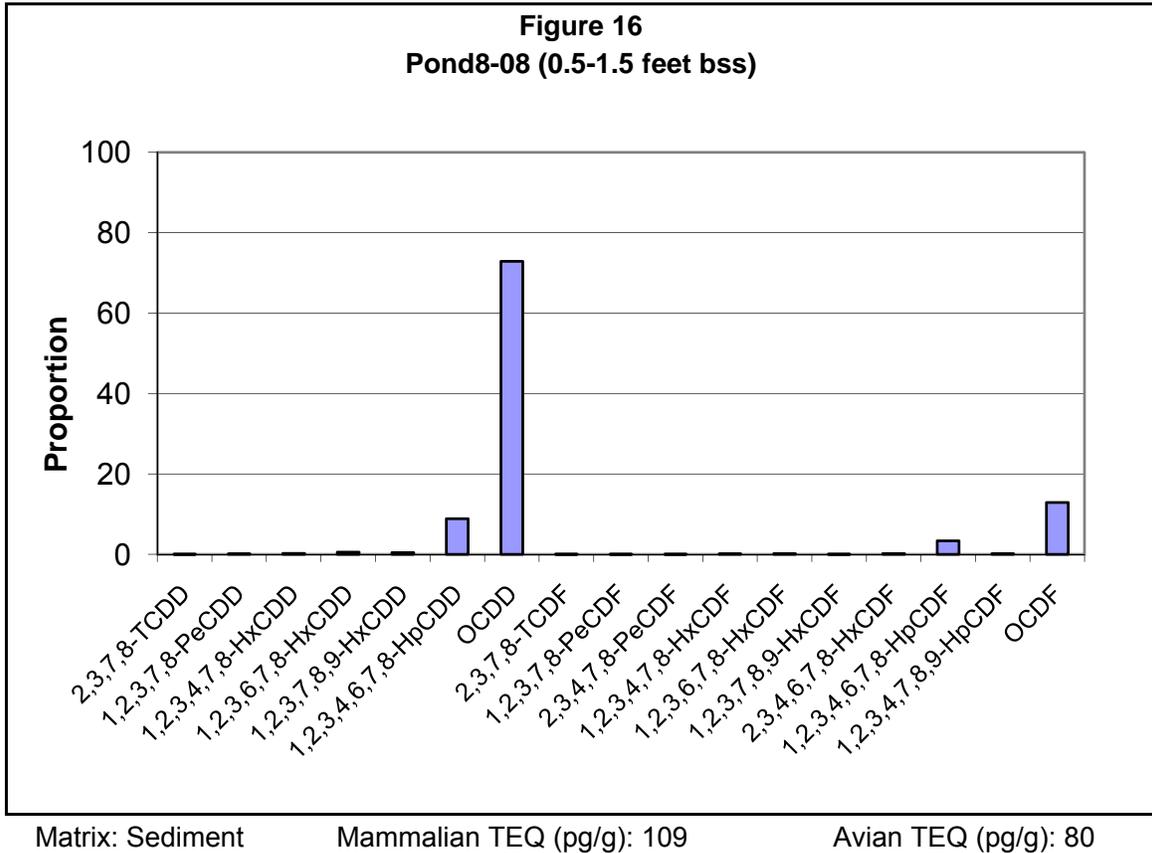


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
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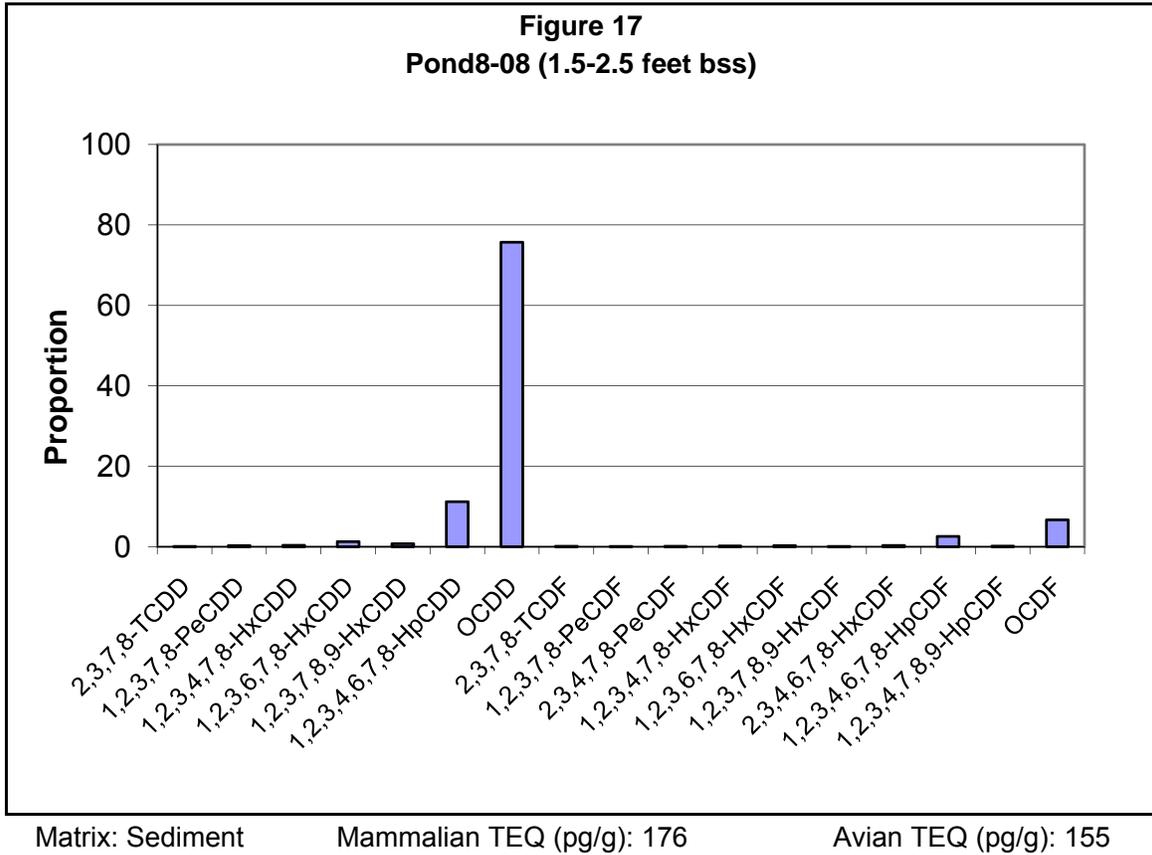


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
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Fort Bragg, California

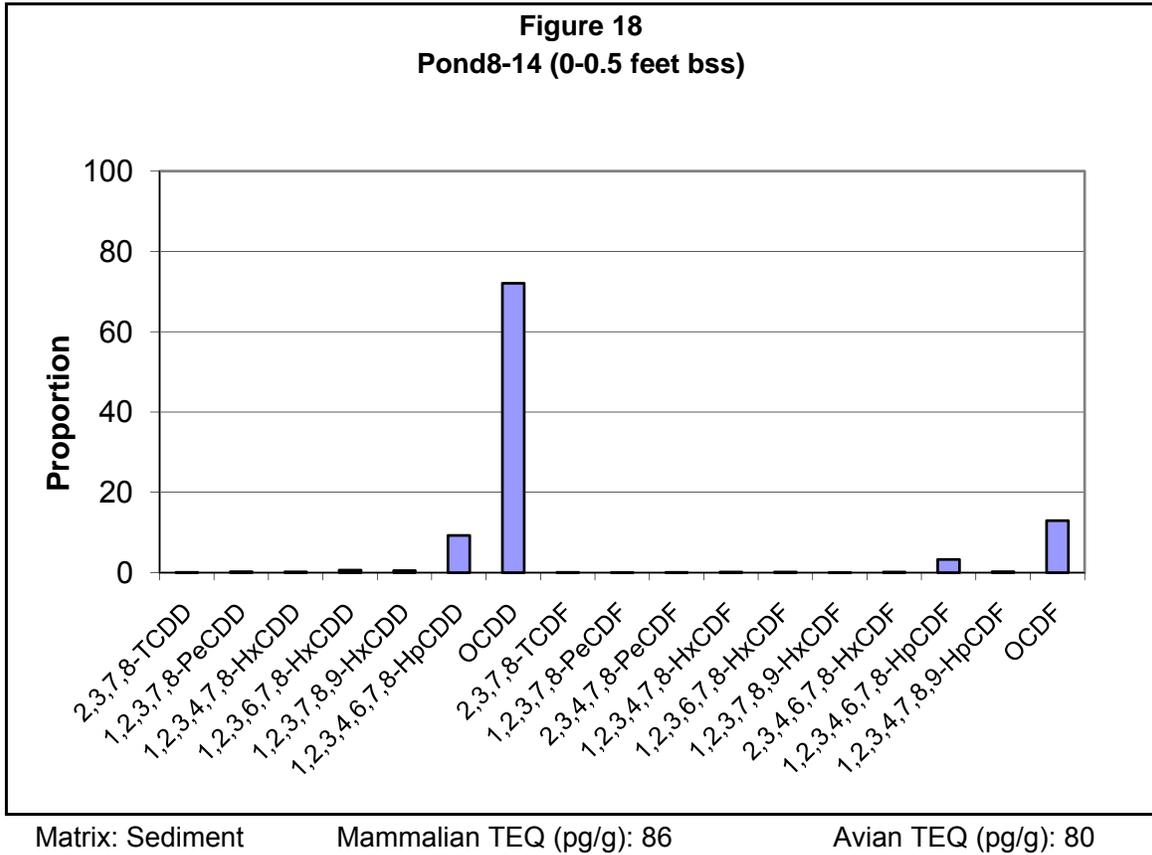


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

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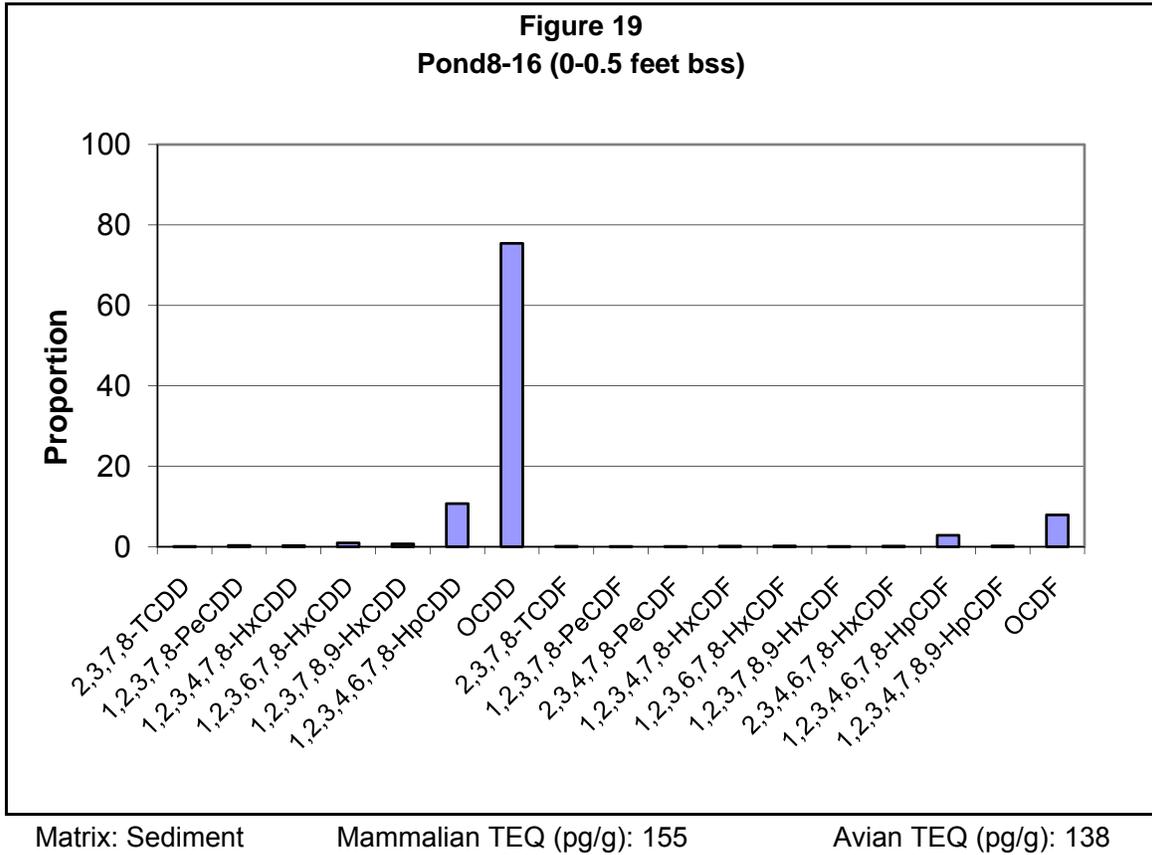


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

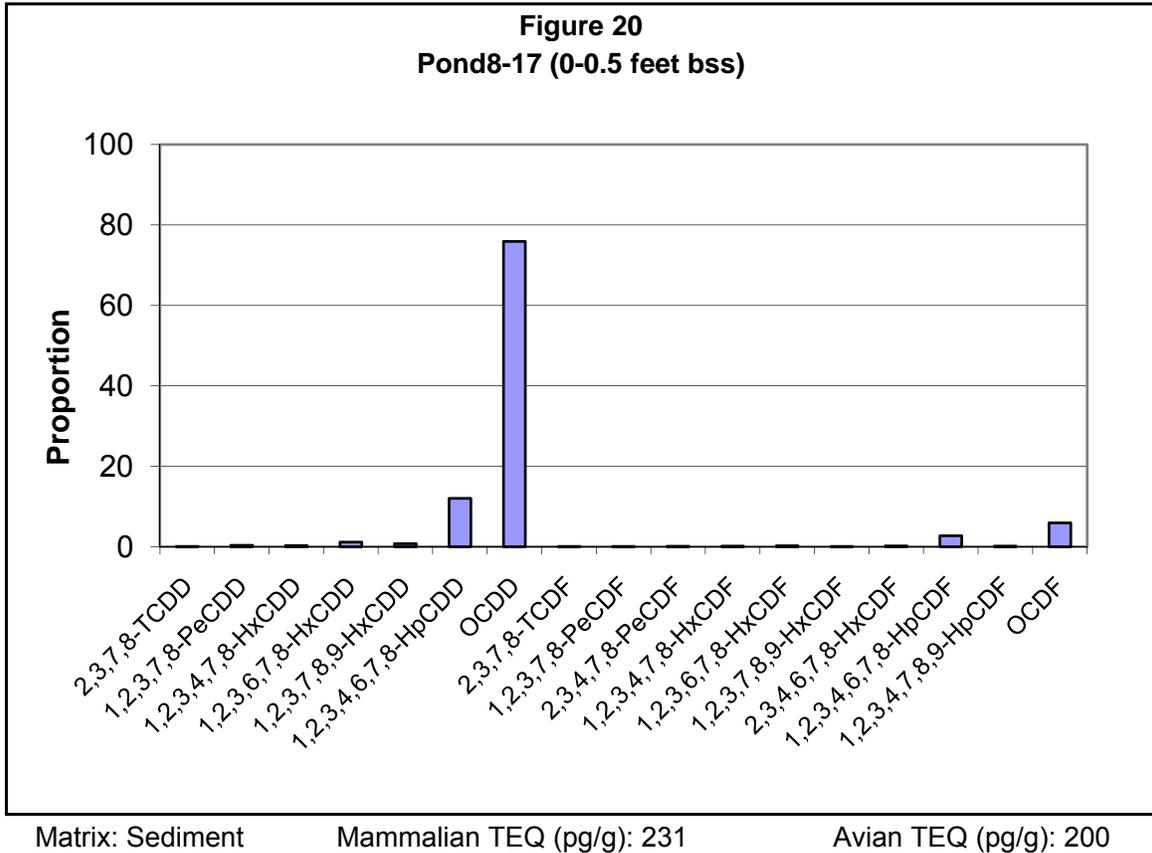


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

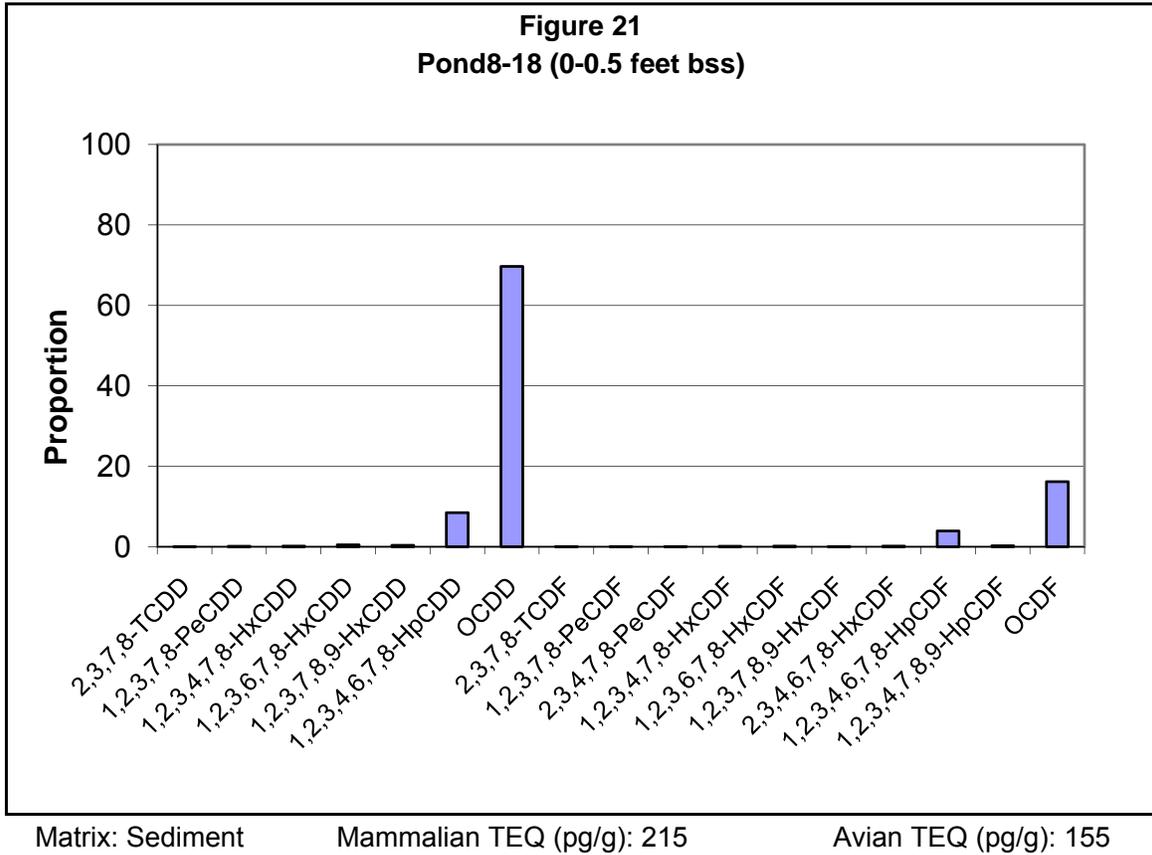


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 East

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
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Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

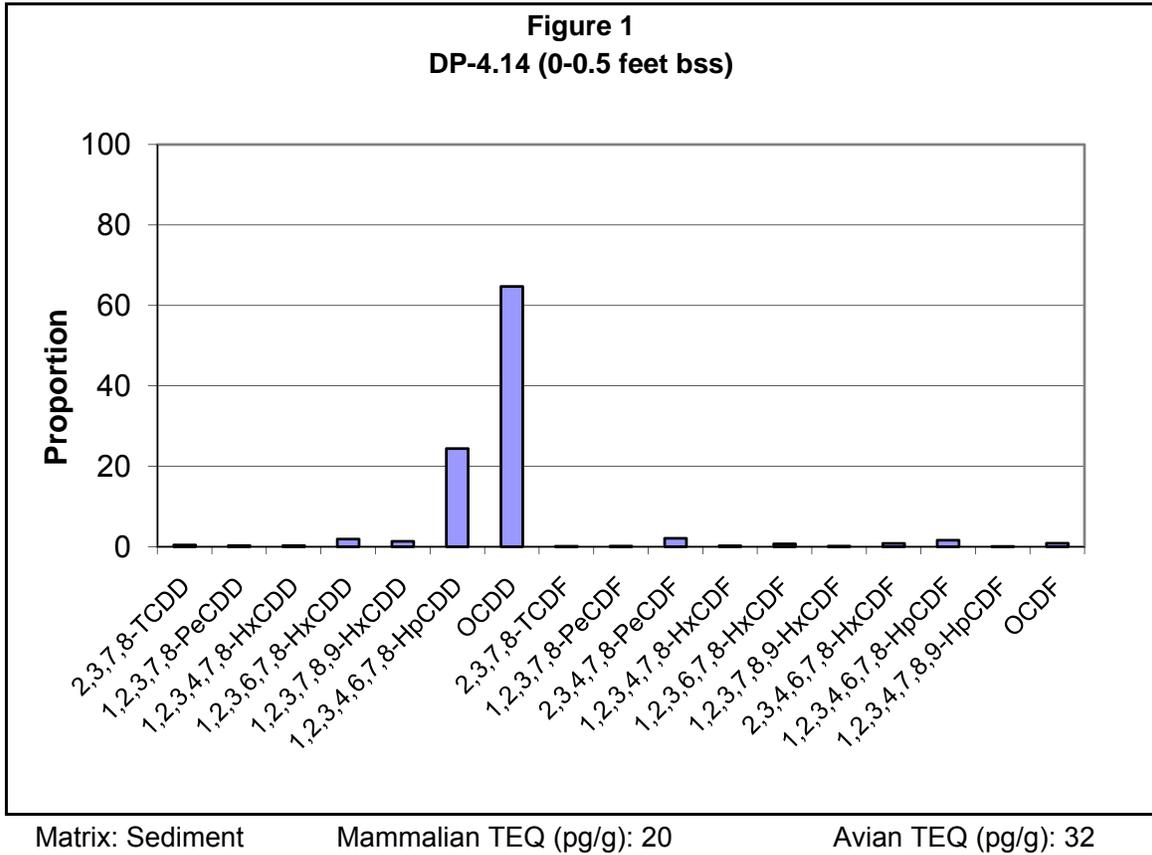
TEQ = toxic equivalent

Figures – West

Dioxin Congener Profiles:
Future Terrestrial Area Sediments
– Pond 8 West

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

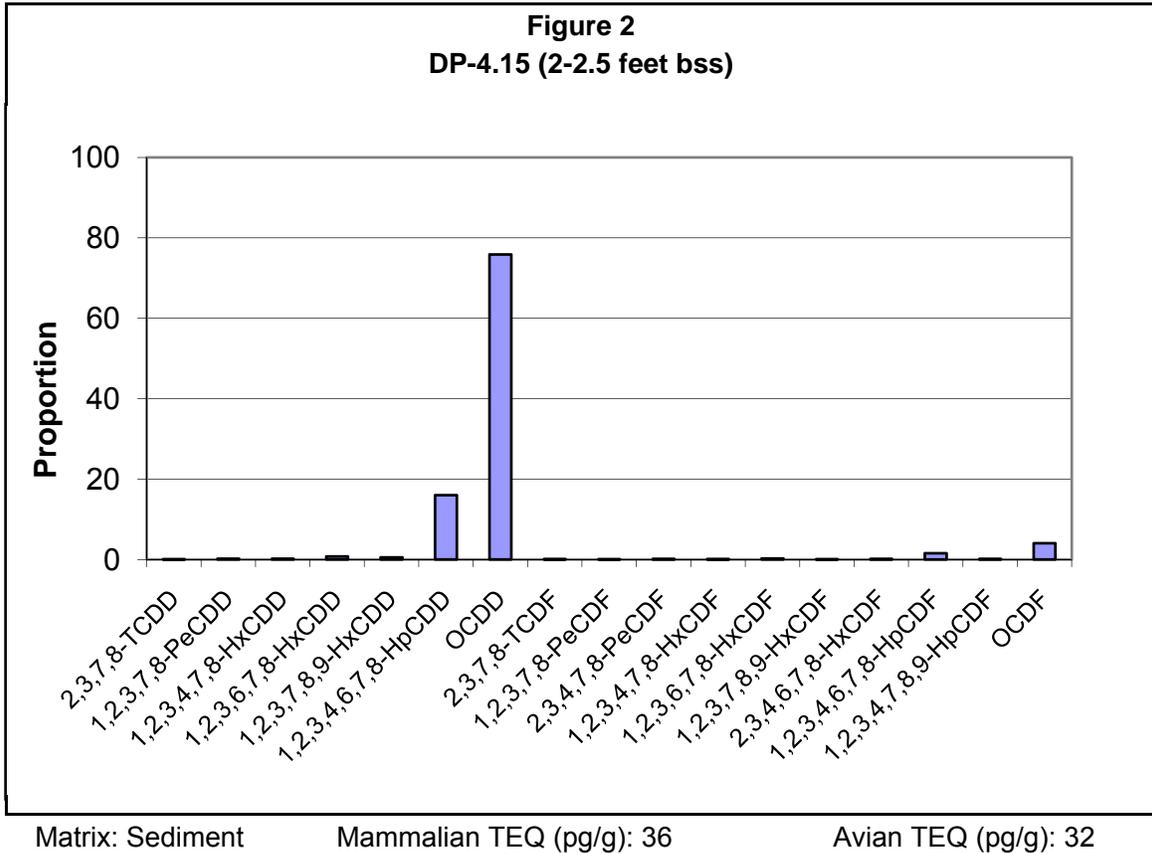


Category based on visual inspection of dioxin profile: bark

Consistent with natural wood ash because: two dominant congeners present (OCDD and 1,2,3,4,6,7,8-HpCDD); presence of OCDD ($\geq 60\%$); presence of some penta-, hexa-, and/or hepta-chlorinated congeners ($\geq 1\%$); general absence of tetra-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
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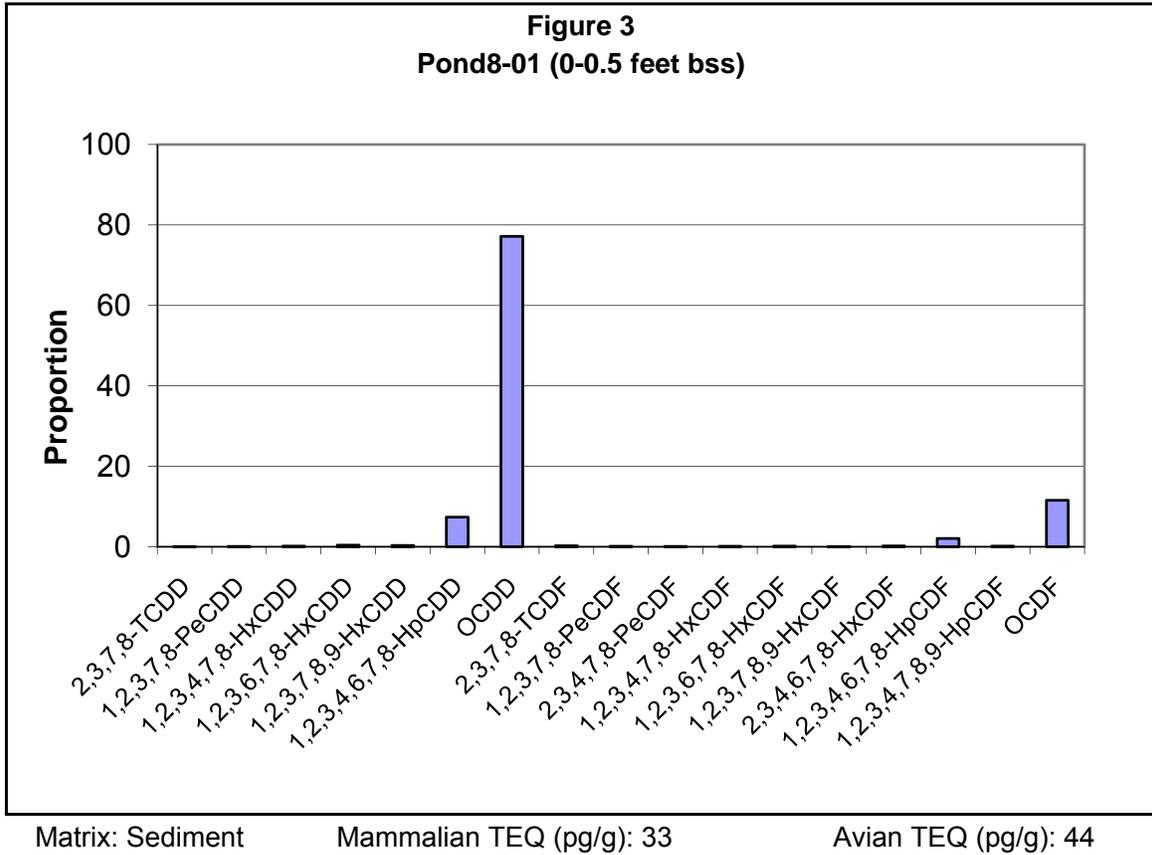


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
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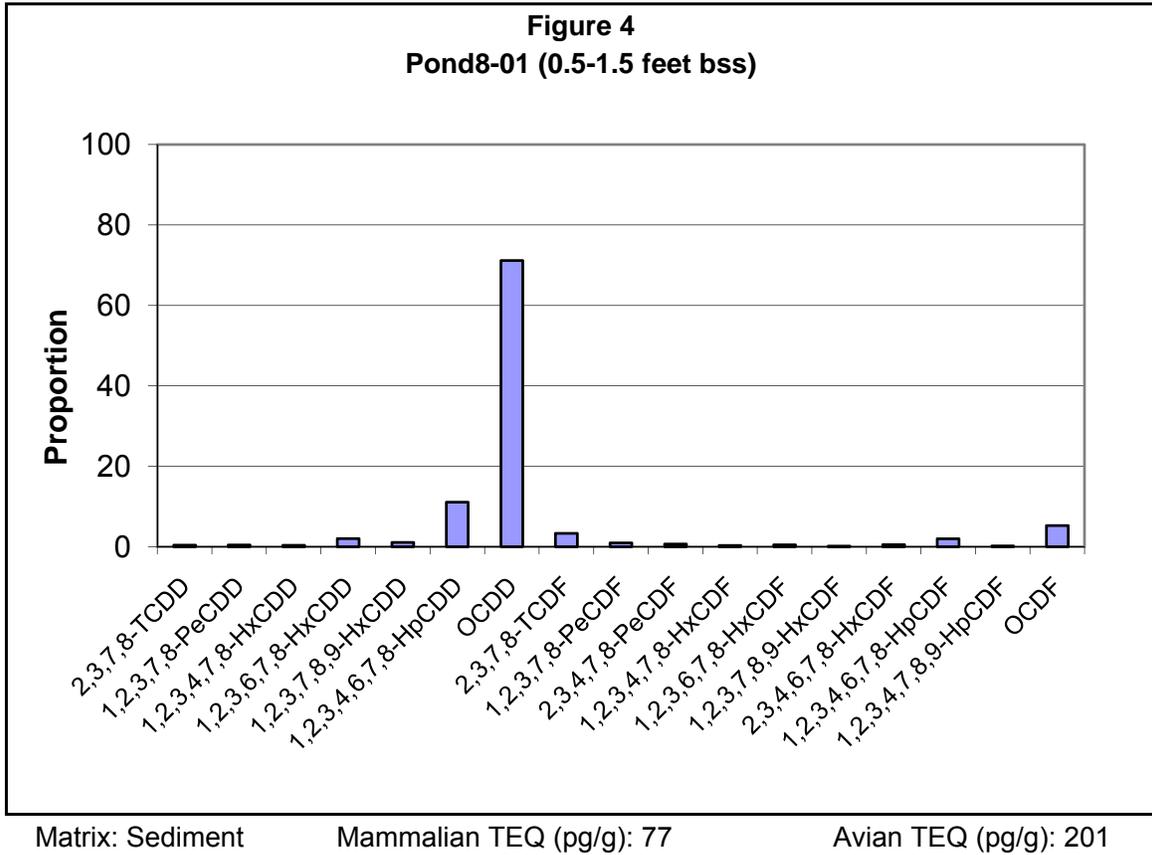


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

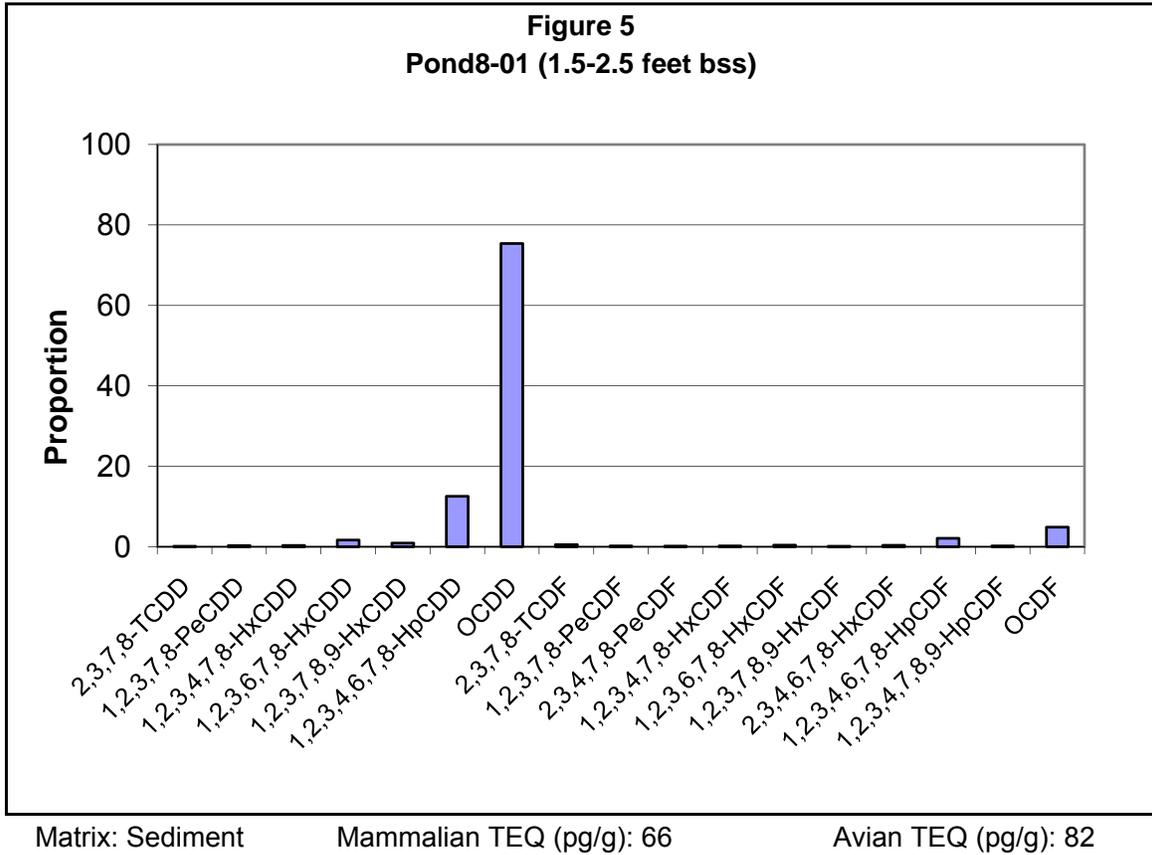


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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Fort Bragg, California

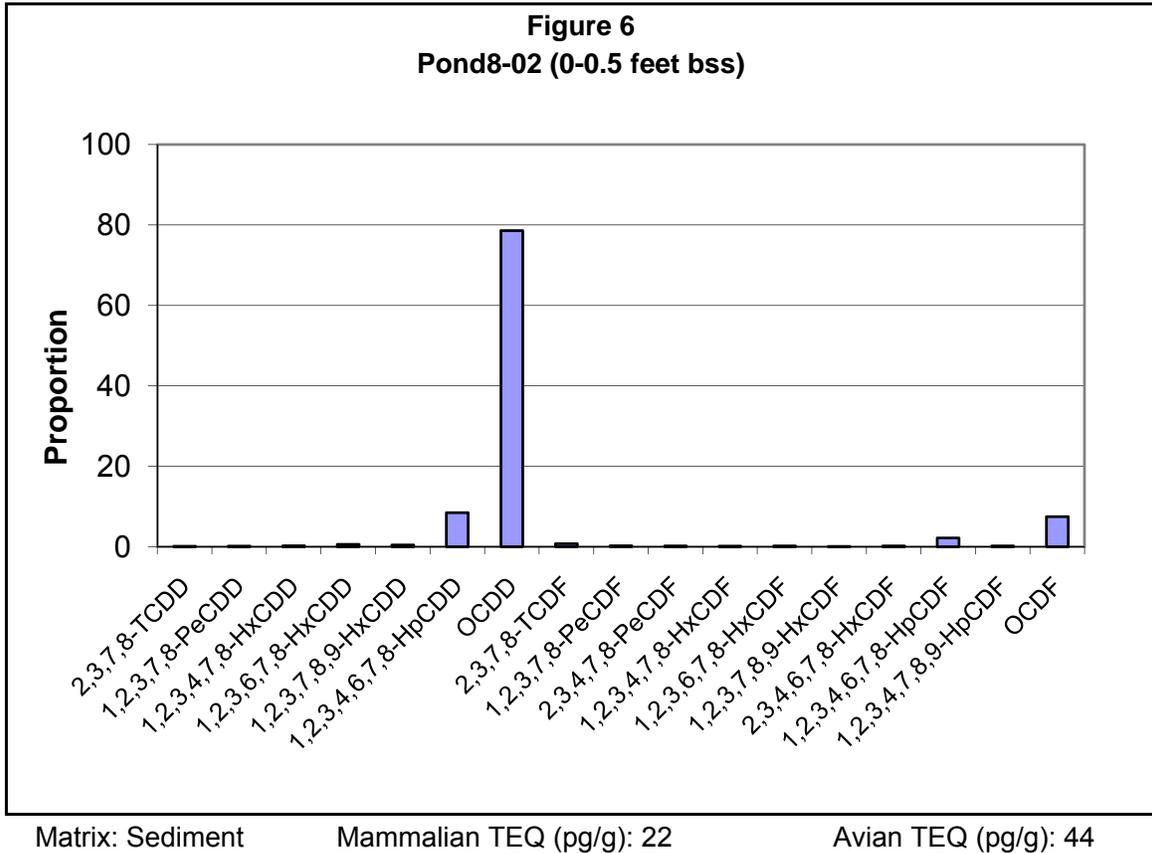


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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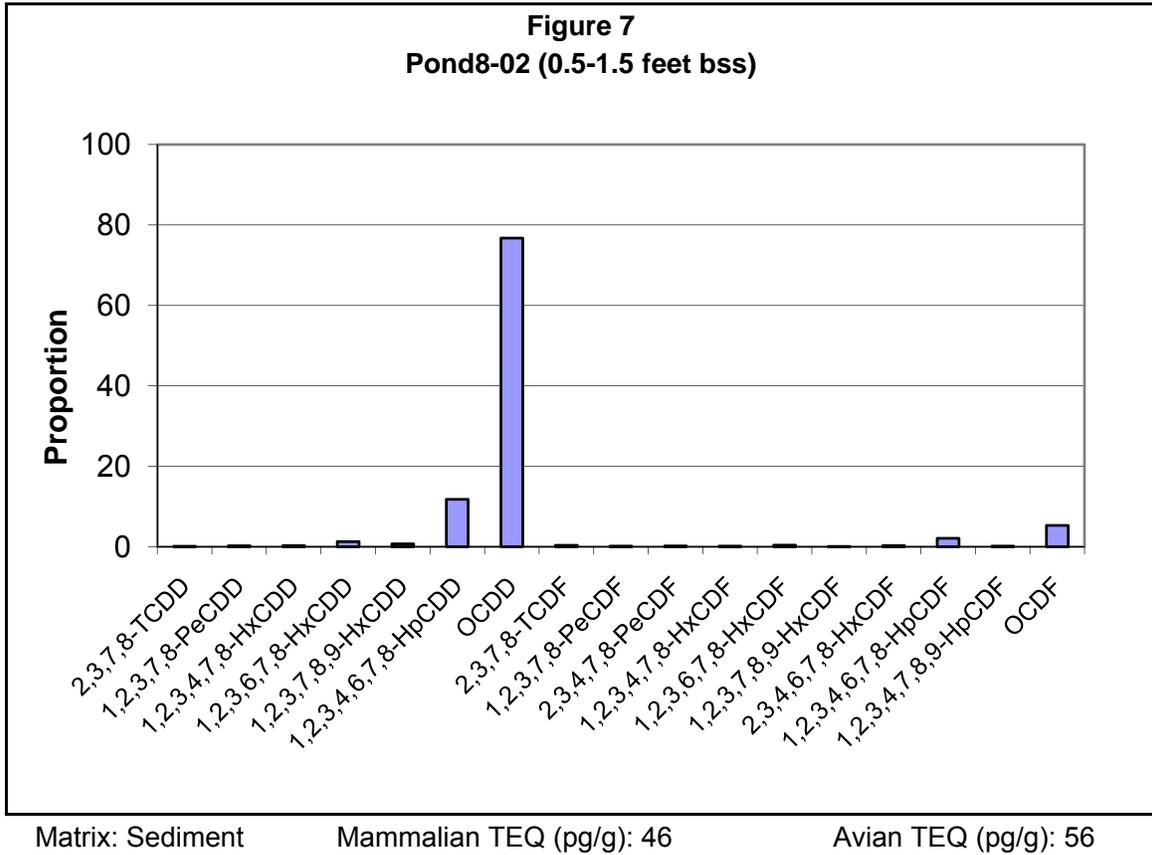


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

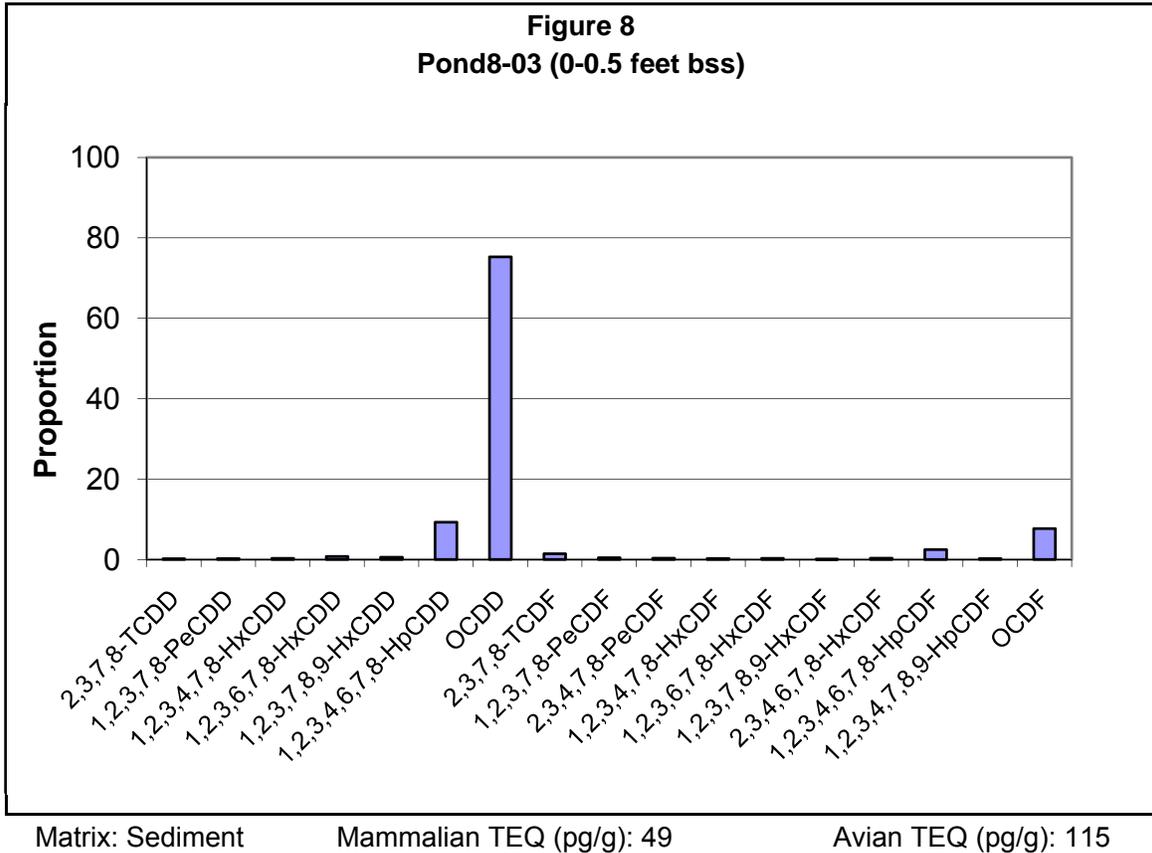


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
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Fort Bragg, California

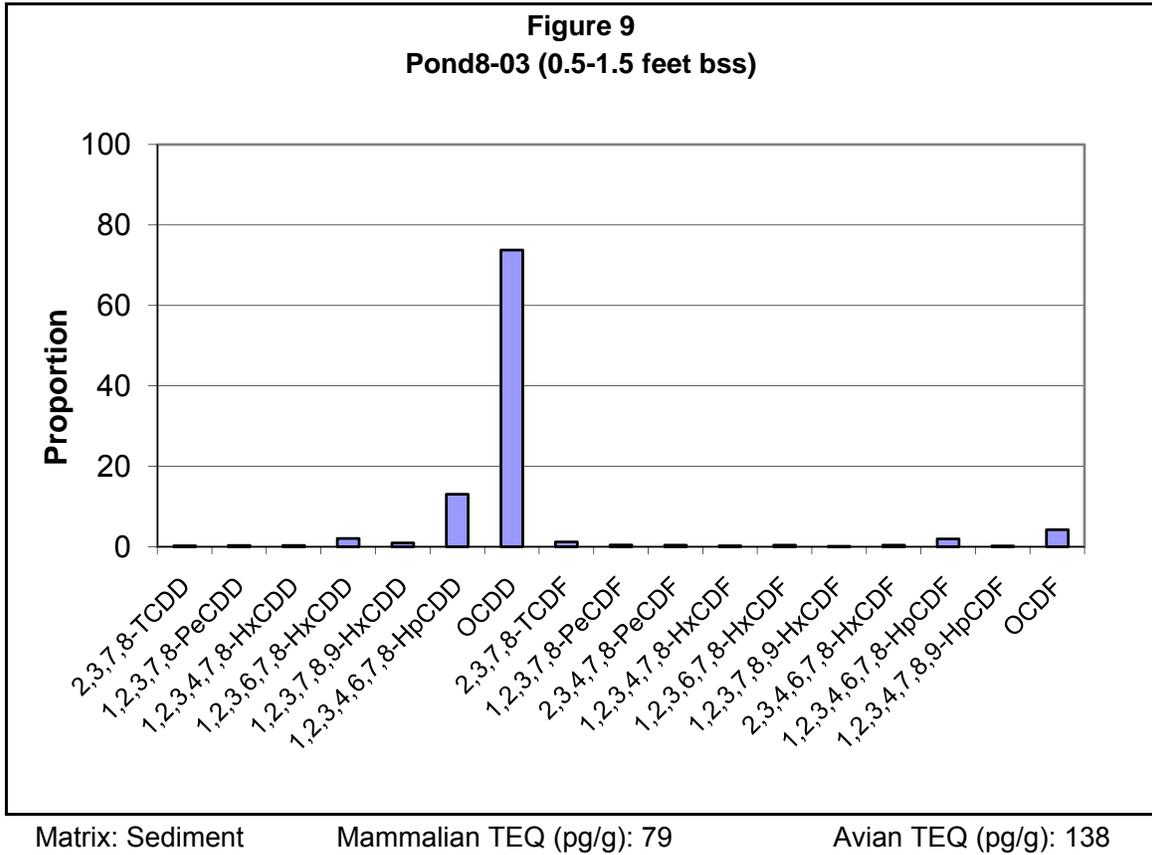


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of 2,3,7,8-TCDF is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

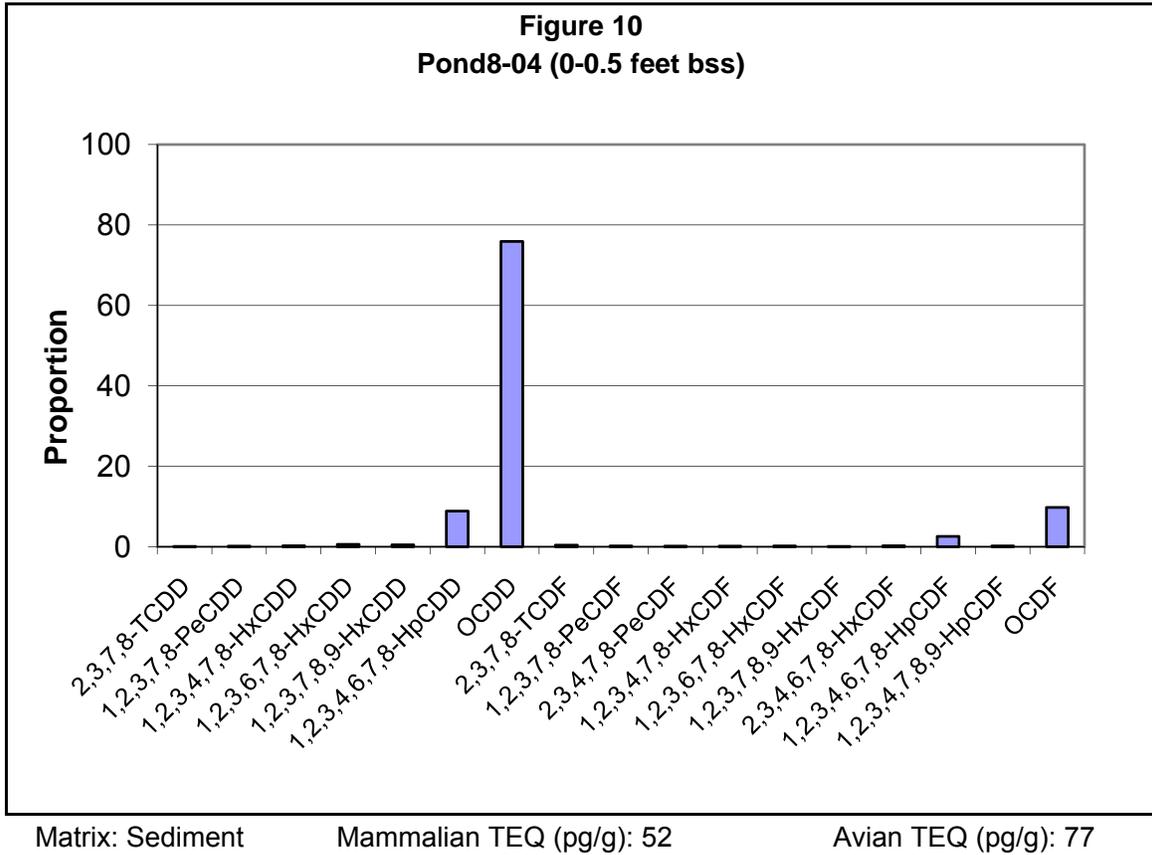


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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Fort Bragg, California

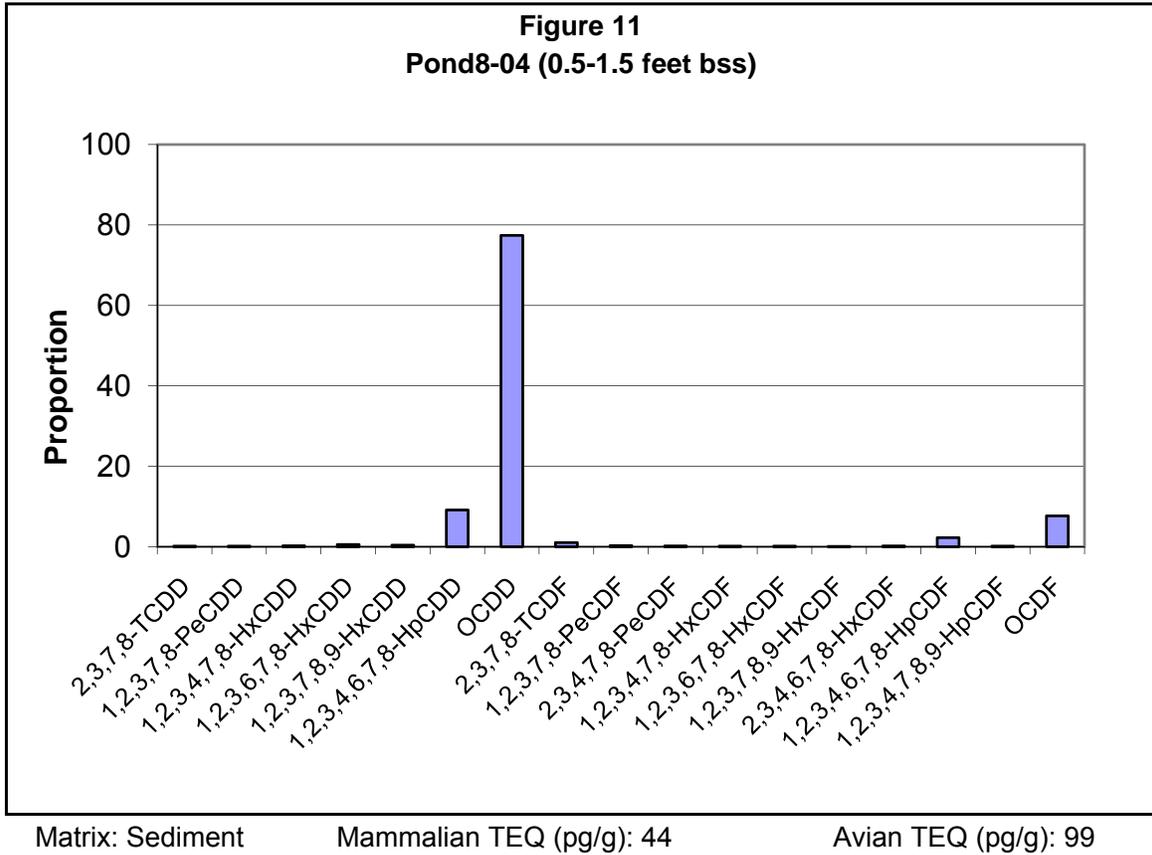


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of 2,3,7,8-TCDF is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

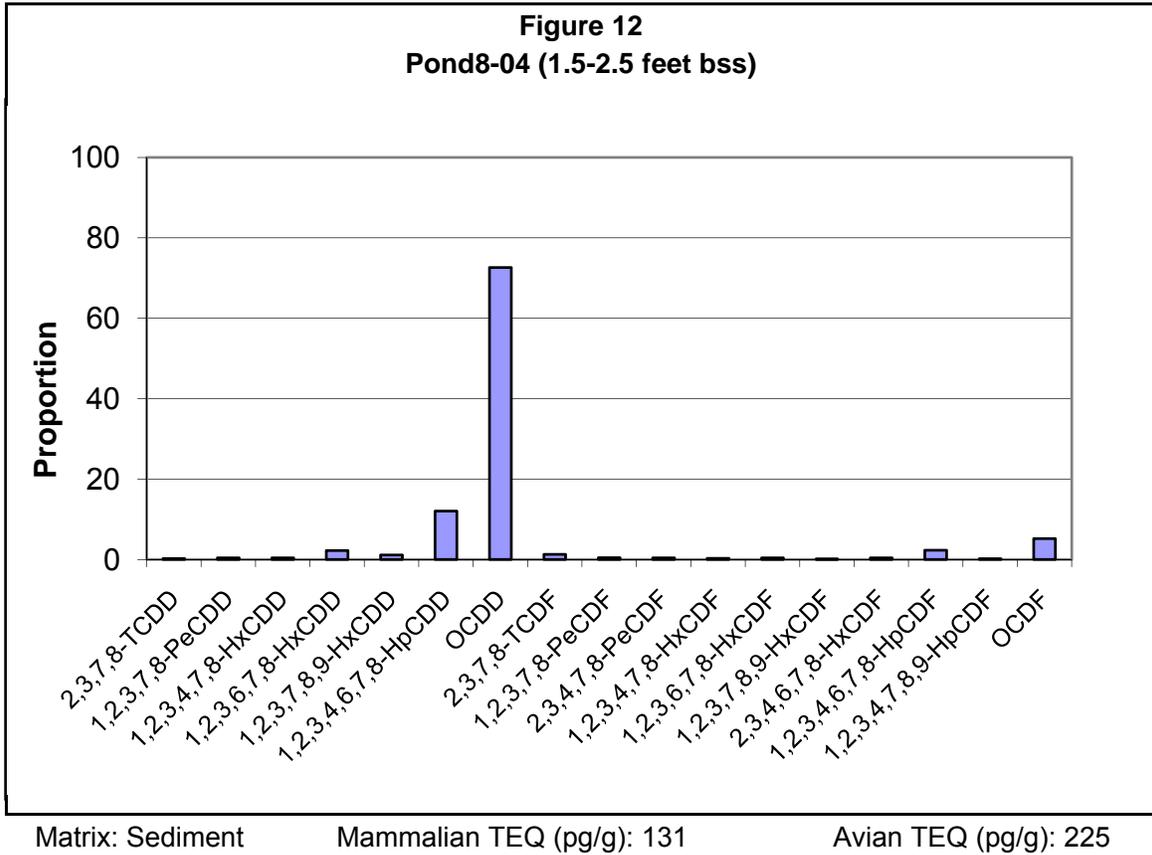


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of 2,3,7,8-TCDF is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

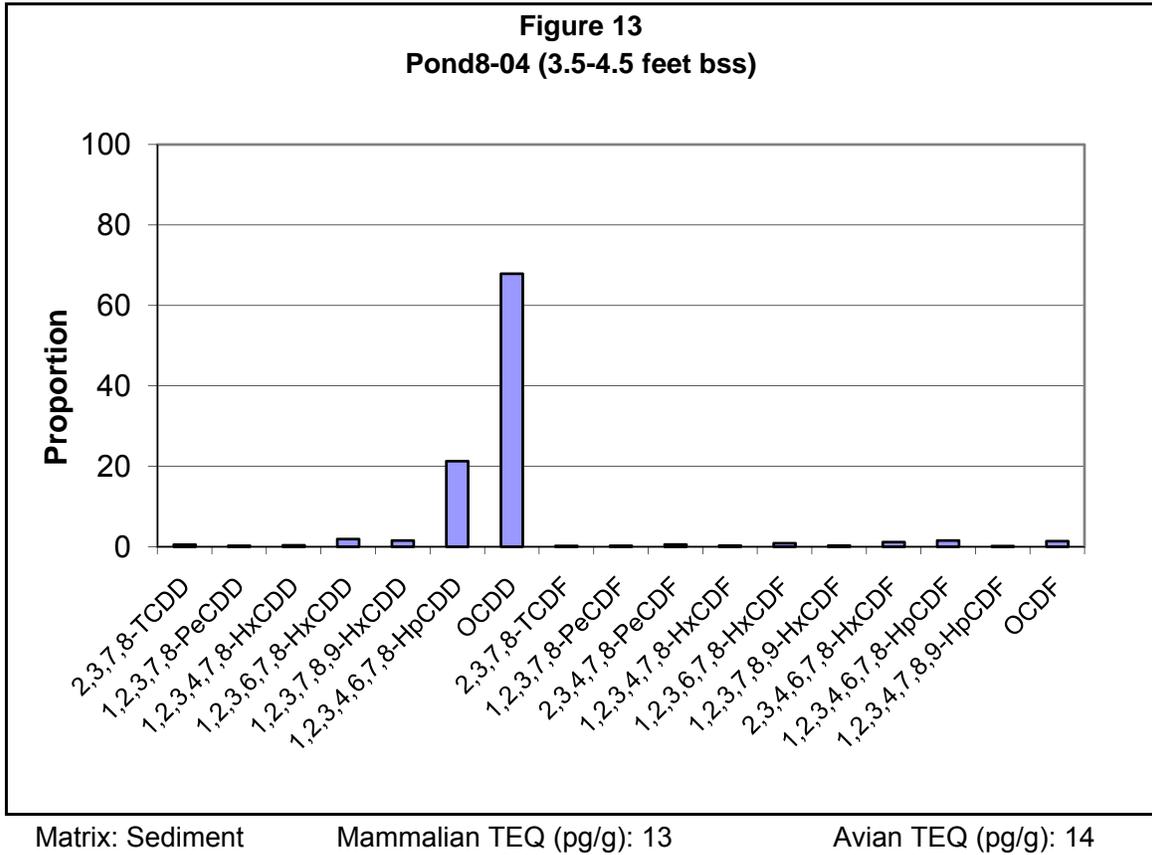


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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Fort Bragg, California

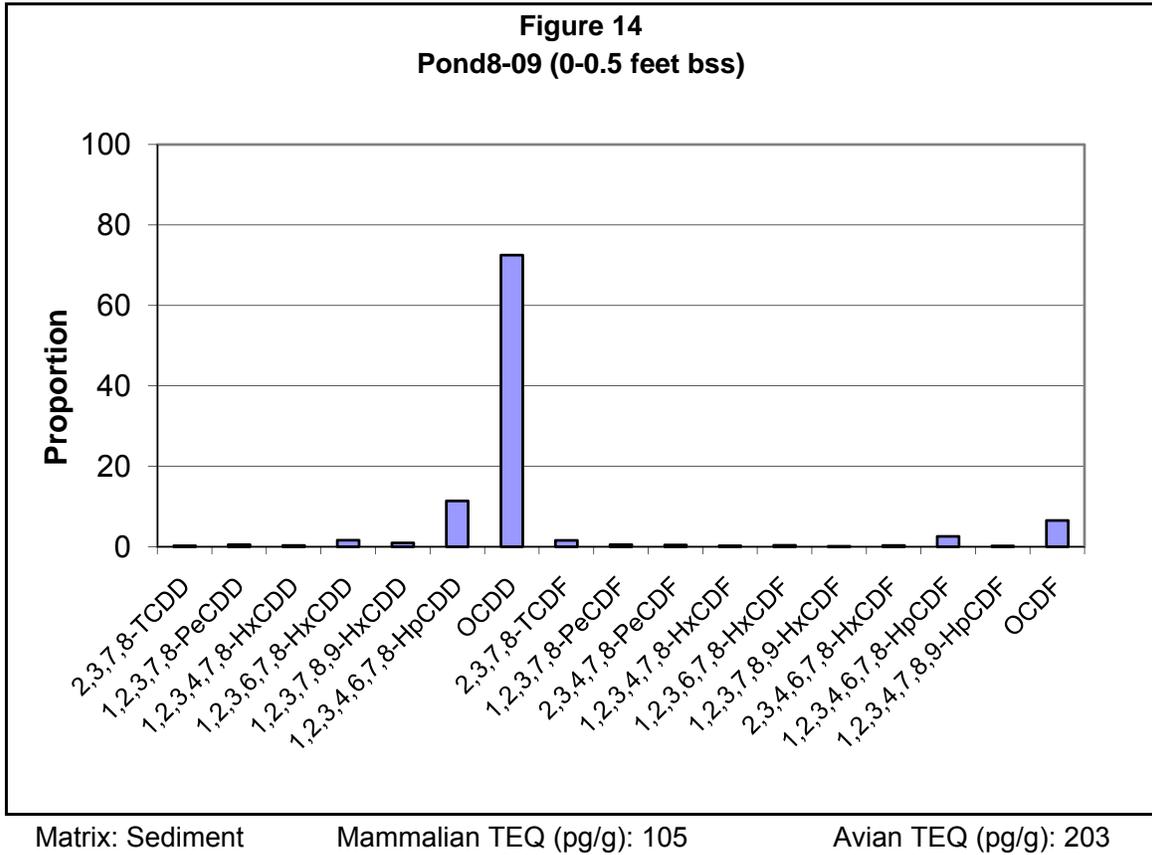


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

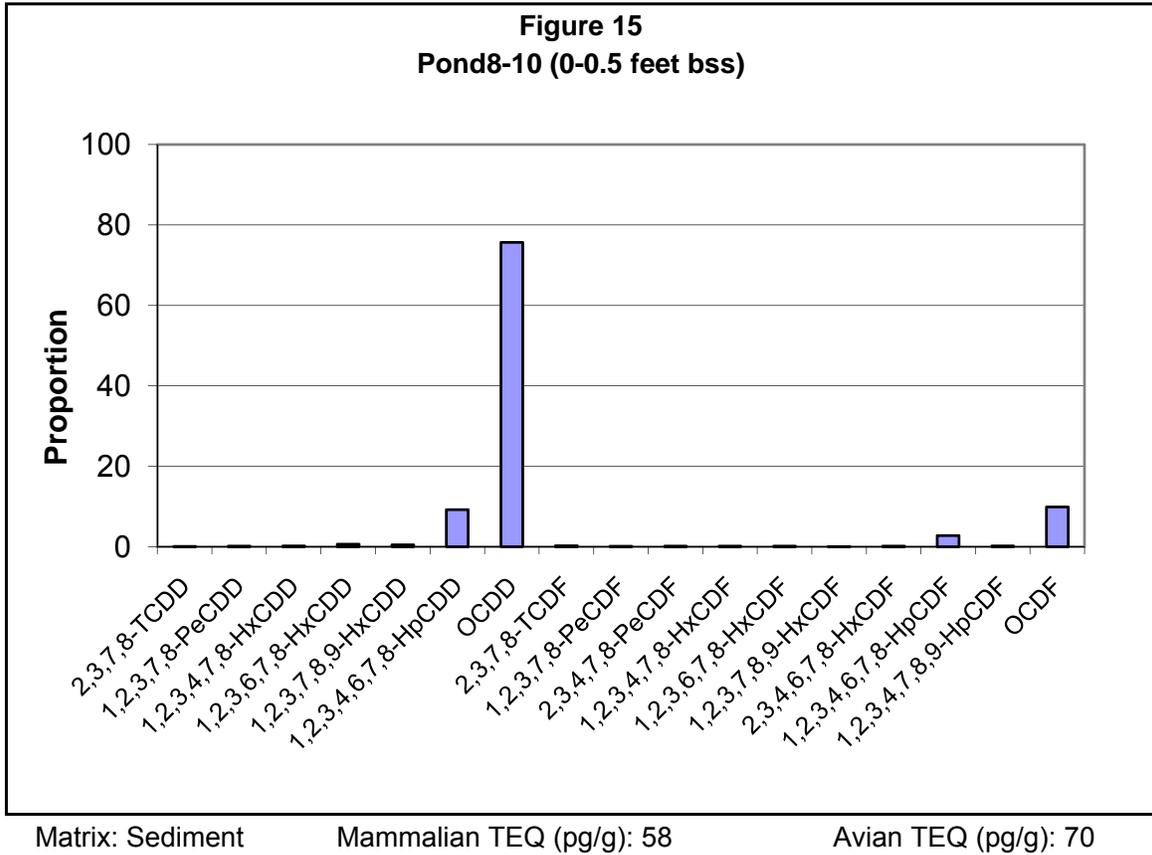


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West**

**Remedial Investigation Report Operable Unit E
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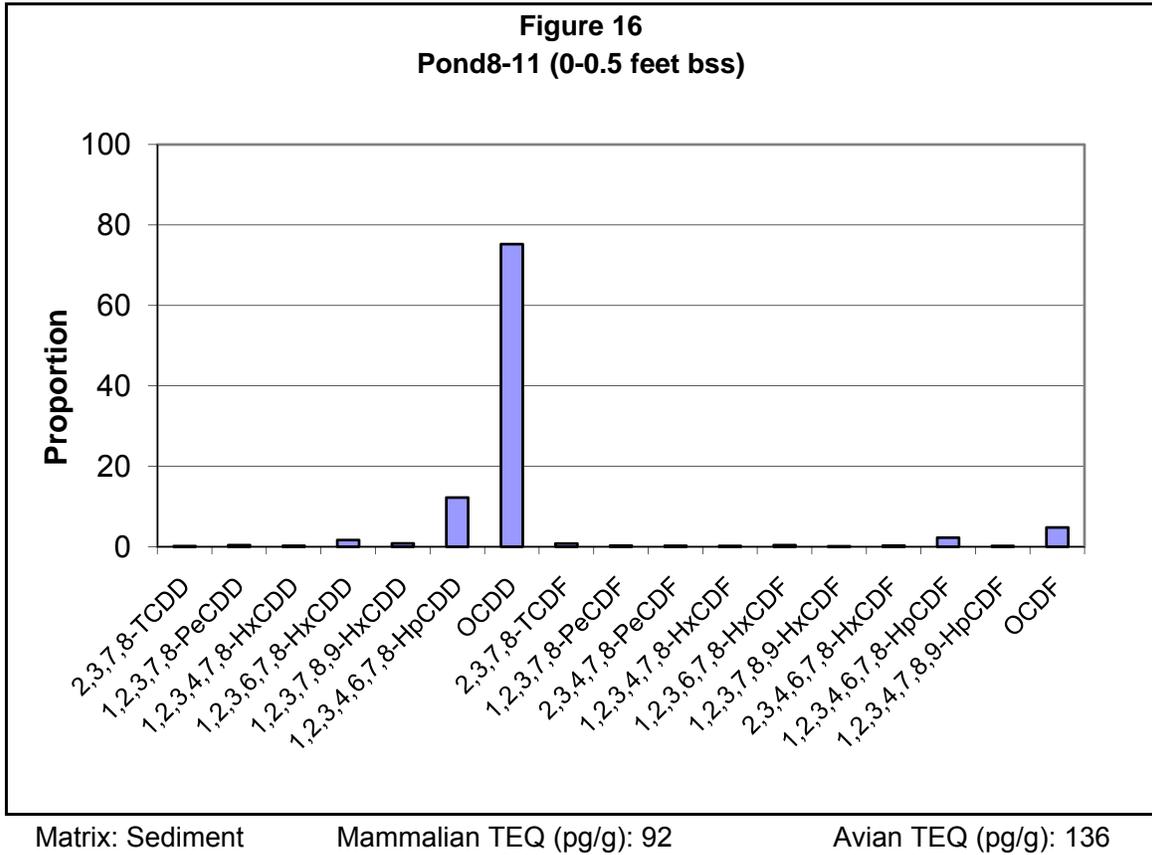


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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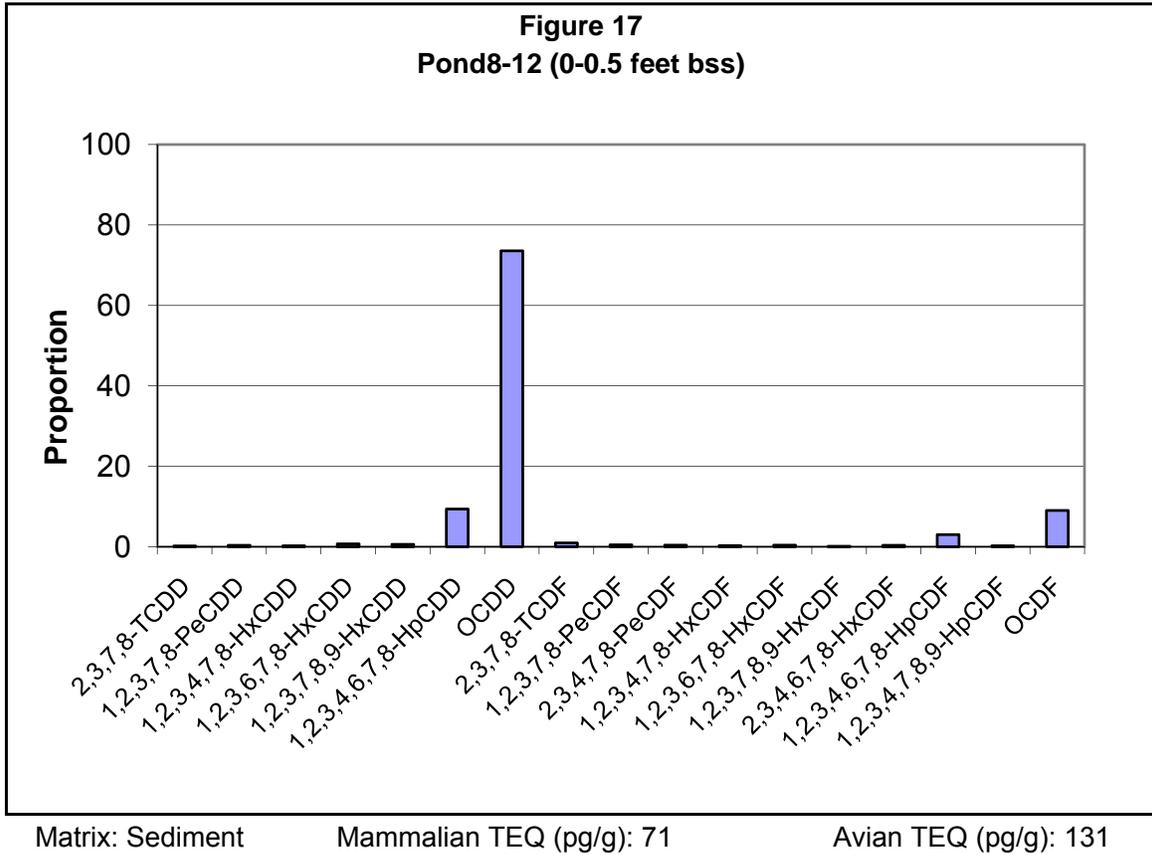


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

Appendix G-2
Dioxin Congener Profiles
Future Terrestrial Area Sediments - Pond 8 West

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Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Appendix G-2
Dioxin Congener Profiles
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Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

TEQ = toxic equivalent



Attachment G-3

Future Wetland Area Soil Dioxin
Congener Profiles

Tables

Dioxin/Furan Source
Classifications

Attachment G-3
Table 1. Dioxin/Furan Source Classifications
Future Wetland Area Soil

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Location ID	Depth (ft bgs)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
HA-4.68	5 to 5.5 ft	8/8/06	HA-4.68-1.0	33	47	ambient
HA-4.90	13.5 to 14 ft	8/8/06	HA-4.90-2.0	504	1318	muni
HA-4.147	1.2 to 1.7 ft	6/27/06	HA-4.147-0.5	3.9	14	muni
MW-4.5	0 to 0.5 ft	9/28/07	MW-4.5-0-0.5	9.1	9.6	ambient
OUE-DP-013	10.5 to 11 ft	6/22/10	OUE-DP-013-5.5-6.5	0.75	6.2	no category
OUE-DP-037	0 to 2.8 ft	6/22/10	OUE-DP-037-0-2.8	4.5	6.2	ambient
OUE-DP-039	2 to 2.7 ft	6/23/10	OUE-DP-039-2-2.7	8.9	3.5	mixture
OUE-DP-039	5 to 5.5 ft	6/23/10	OUE-DP-039-5-5.5	6.9	2.4	mixture
OUE-DP-039	10 to 11.5 ft	6/24/10	OUE-DP-039-10-11.5	13	5.7	mixture
OUE-DP-045	5 to 5.5 ft	6/22/10	OUE-DP-045-0-0.5	6.8	10	ambient
OUE-DP-051	1.5 to 2 ft	6/26/10	OUE-DP-051-1.5-2	11	16	mixture
OUE-DP-052	0 to 0.5 ft	6/26/10	OUE-DP-052-0-0.5	203	330	mixture
OUE-DP-052	0.5 to 1.5 ft	6/26/10	OUE-DP-052-0.5-1.5	2729	8299	muni
OUE-DP-052	3 to 4 ft	6/26/10	OUE-DP-052-3-4	2.2	4.3	mixture
OUE-DP-057	0 to 1 ft	6/24/10	OUE-DP-057-0-1	6.0	6.3	ambient
OUE-DP-076	6 to 7 ft	11/2/10	OUE-DP-076-6-7	2.6	9.1	muni
OUE-DP-079	3.5 to 4 ft	11/5/10	OUE-DP-079-3.5-4	3.3	11	muni
OUE-DP-088	0 to 0.5 ft	11/4/10	OUE-DP-088-0-0.5	9.6	22	mixture
OUE-DP-089	5.9 to 6.8 ft	11/2/10	OUE-DP-089-0.5-1.3	12	18	muni
OUE-DP-089	10 to 10.5 ft	11/2/10	OUE-DP-089-4.5-5	2.6	9.5	muni
OUE-DP-090	1 to 1.5 ft	11/5/10	OUE-DP-090-0-0.5	4.0	8.1	mixture
OUE-DP-090	2 to 2.5 ft	11/5/10	OUE-DP-090-1-1.5	2.9	8.1	mixture
OUE-DP-093	6.8 to 7.3 ft	11/3/10	OUE-DP-093-0-0.5	2.3	4.8	mixture
OUE-HA-023B	5 to 6.5 ft	6/25/10	OUE-HA-023B-0-1.5	11	27	muni
OUE-T2-2a	6 to 6.5 ft	11/3/10	OUE-T2-2-0.5-1	32	33	ambient
OUE-T2-2b	6 to 6.5 ft	12/14/10	T2-2-2-2.5	36	28	ambient

Notes:

ambient = congener profile consistent with ambient dioxin/furans.

mixture = congener profile consistent with multiple sources of dioxin/furans.

muni = congener profile consistent with dioxin/furans from (municipal) waste wood incineration.

no category = profile is ambiguous, sample was not classified.

Acronyms and Abbreviations:

bgs = below ground surface

ft = feet

pg/g = picogram per gram

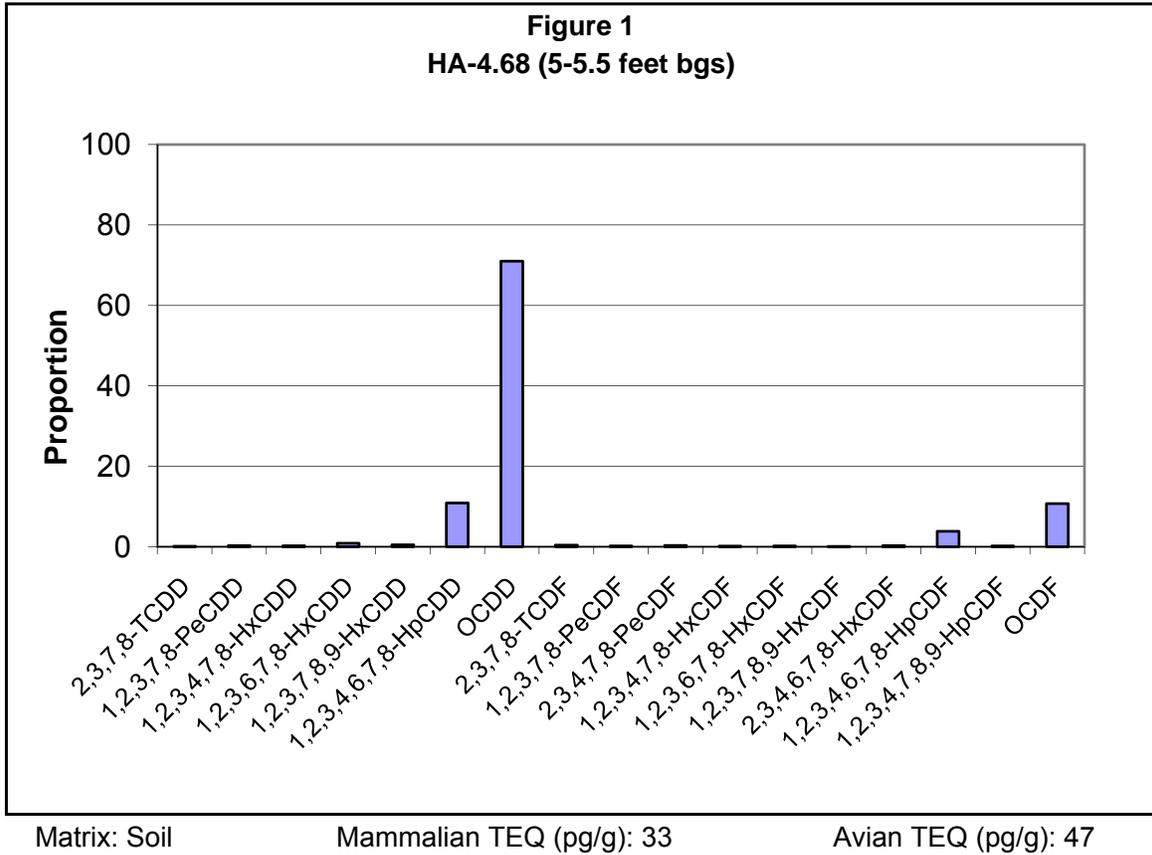
TEQ = toxic equivalent

Figures

Dioxin Congener Profiles

**Attachment G-3
Dioxin Congener Profiles
Future Wetland Area Soil**

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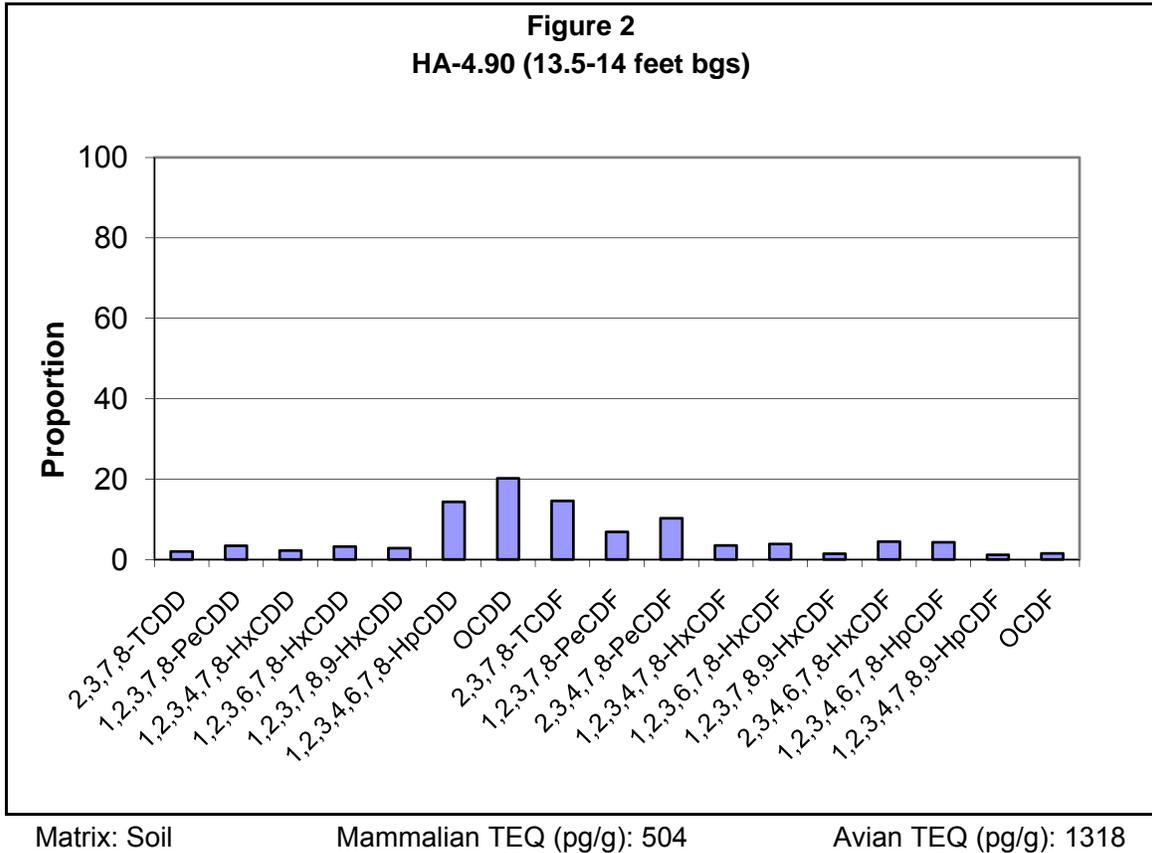


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-3
Dioxin Congener Profiles
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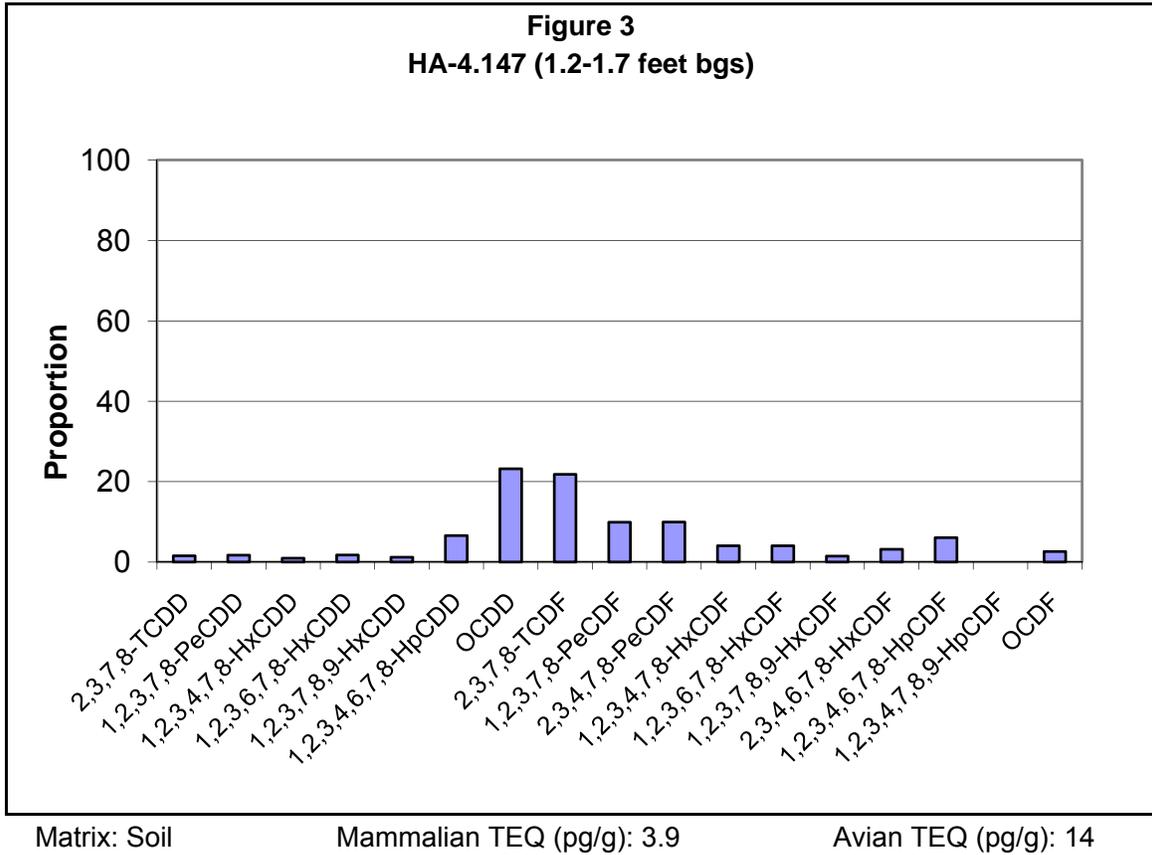


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF (≥5%); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners (≥1.5%).

**Attachment G-3
Dioxin Congener Profiles
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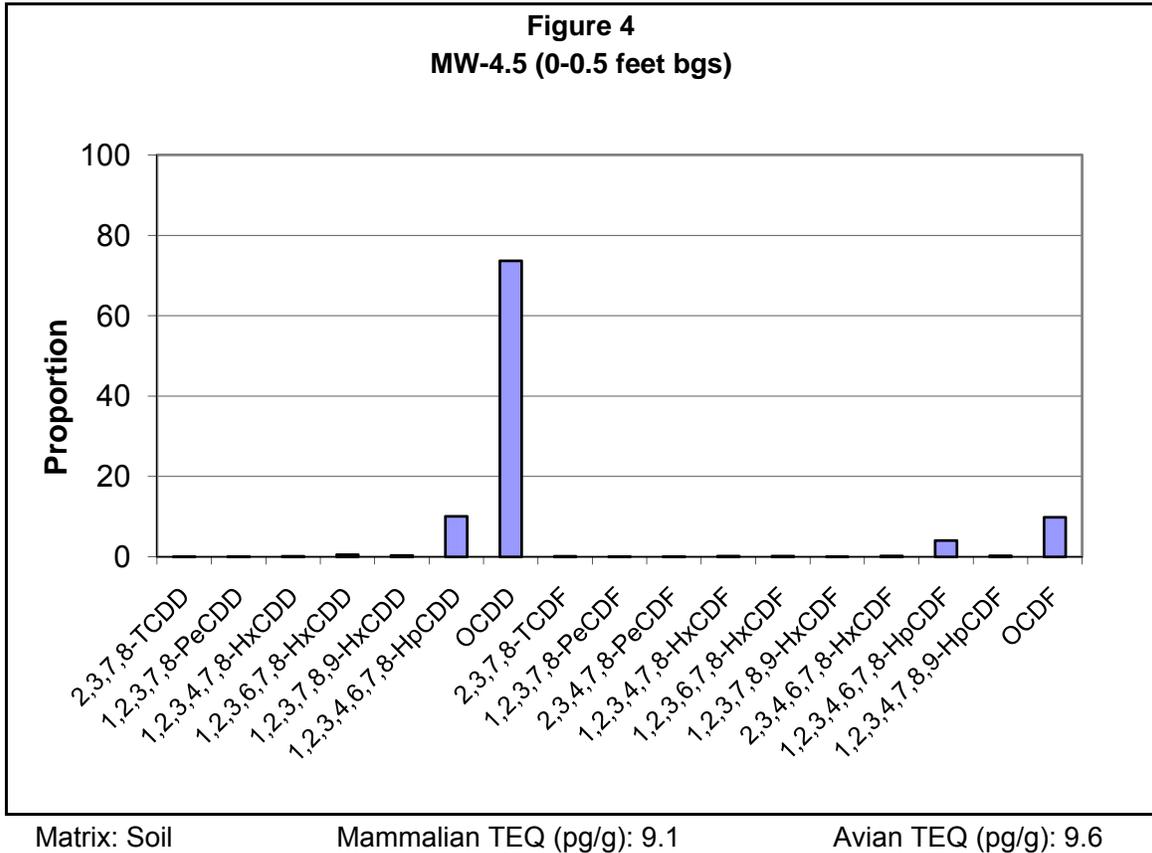


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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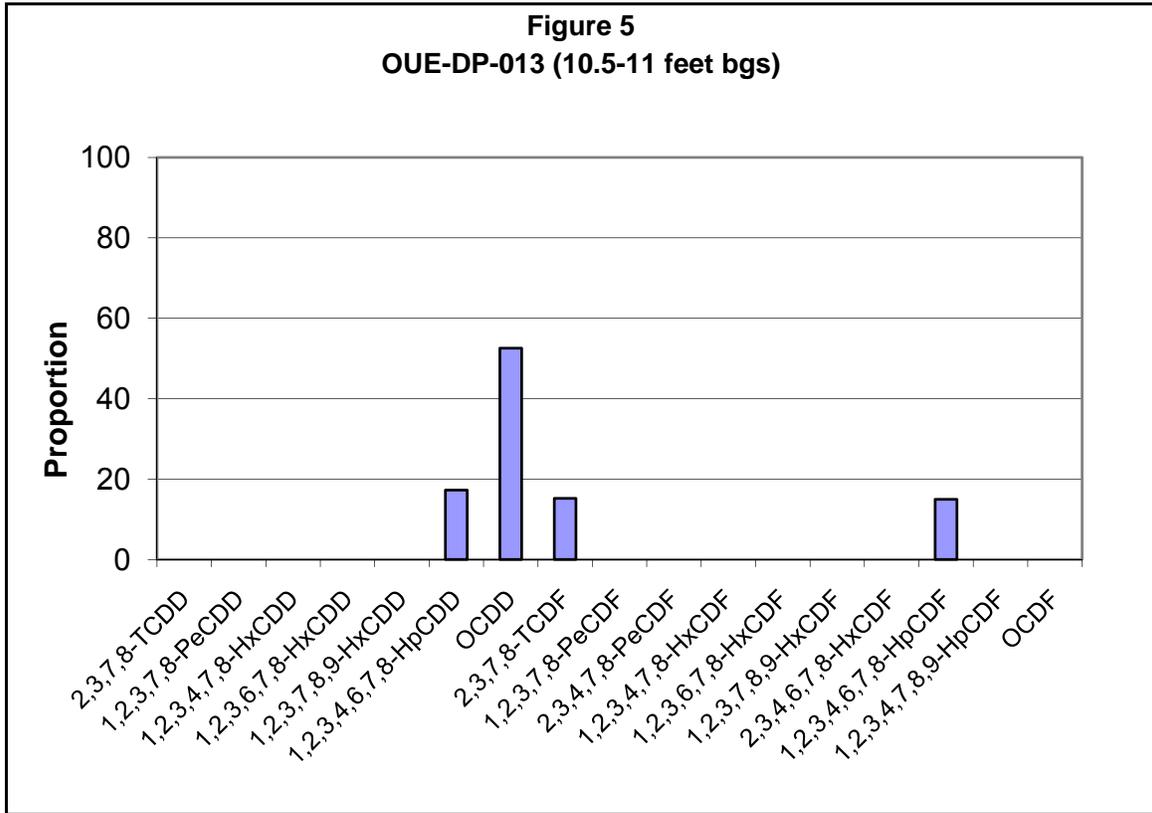


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

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Future Wetland Area Soil**

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Matrix: Soil

Mammalian TEQ (pg/g): 0.75

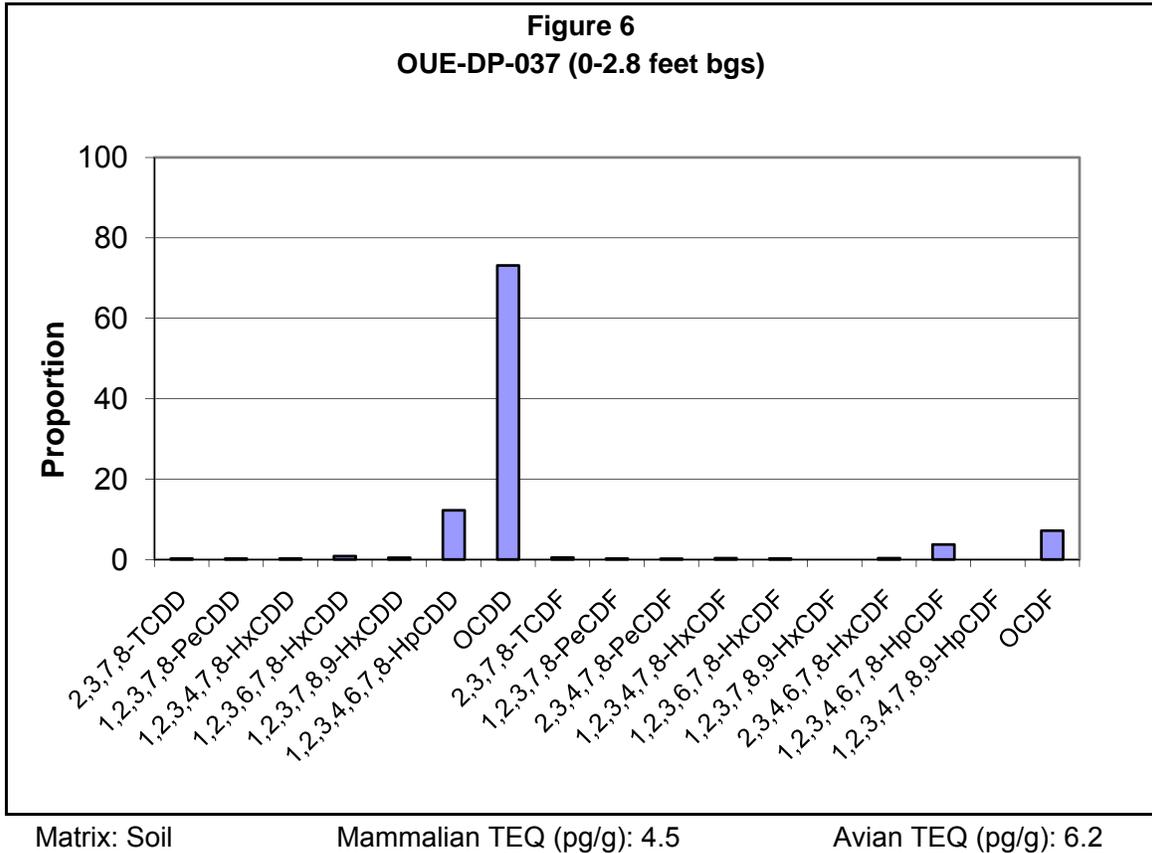
Avian TEQ (pg/g): 6.2

Category based on visual inspection of dioxin profile: no category

Inconsistent with any source profile; dioxin profile obscured by low detection frequency of congeners.

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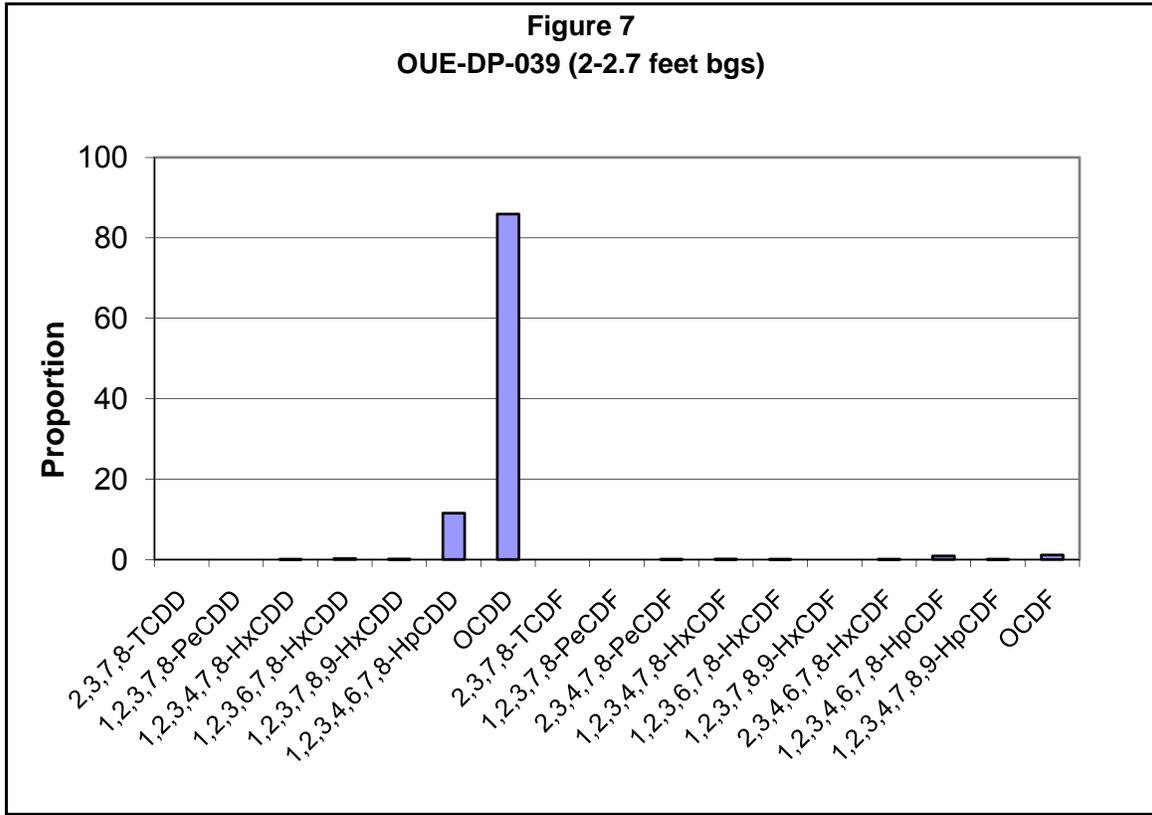


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

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Future Wetland Area Soil**

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Matrix: Soil

Mammalian TEQ (pg/g): 8.9

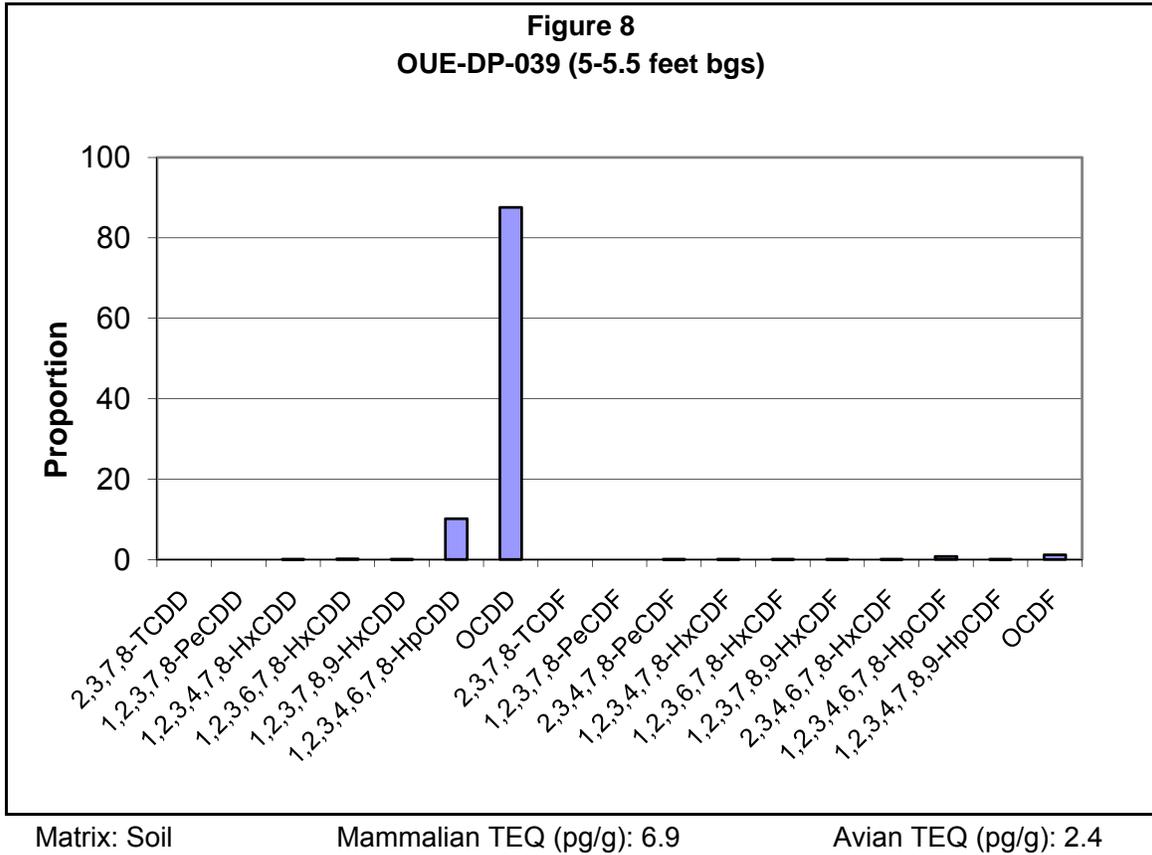
Avian TEQ (pg/g): 3.5

Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-3
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Future Wetland Area Soil**

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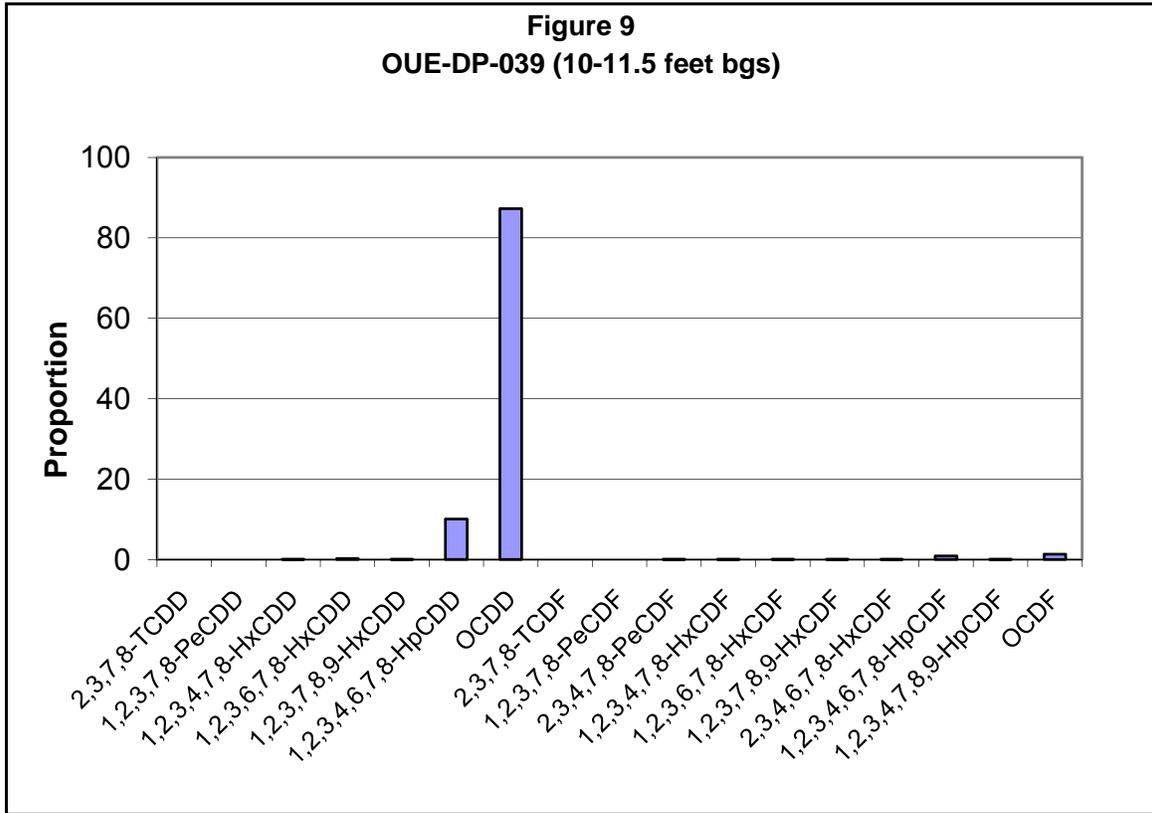


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-3
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Future Wetland Area Soil**

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Matrix: Soil

Mammalian TEQ (pg/g): 13

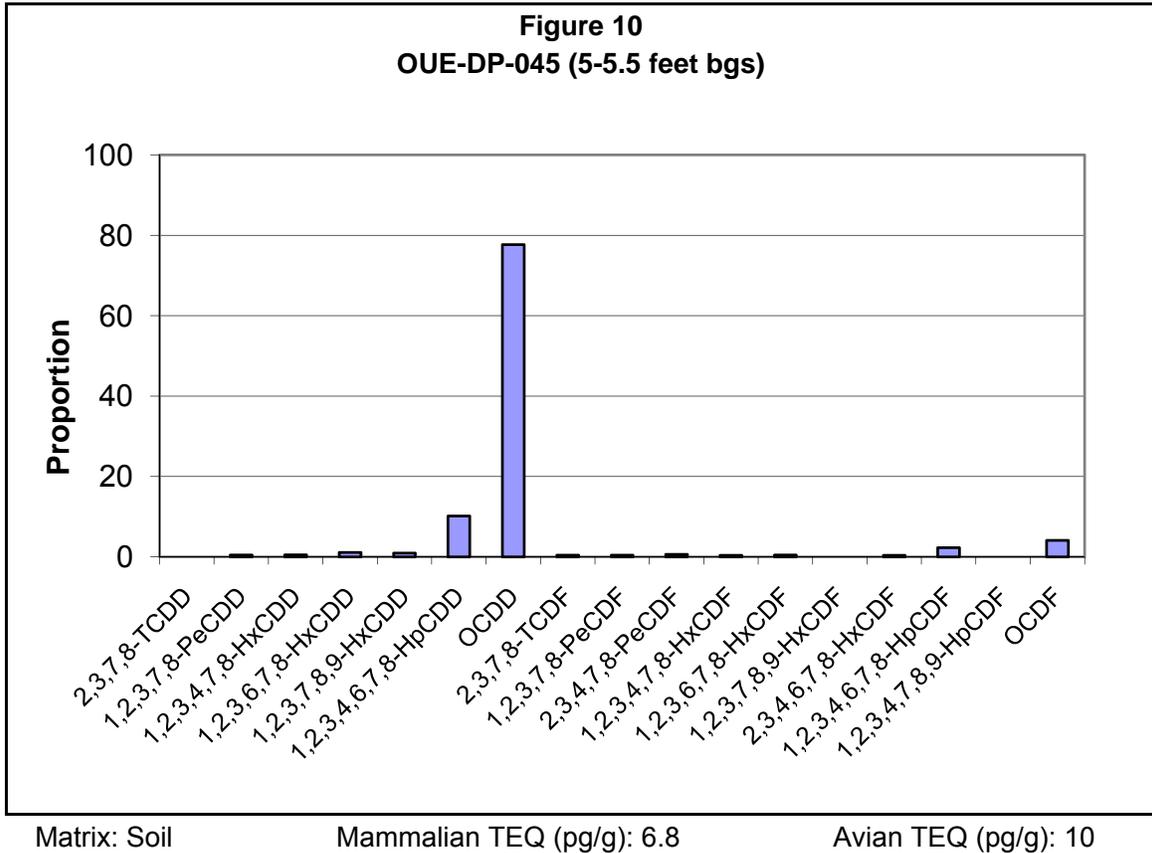
Avian TEQ (pg/g): 5.7

Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-3
Dioxin Congener Profiles
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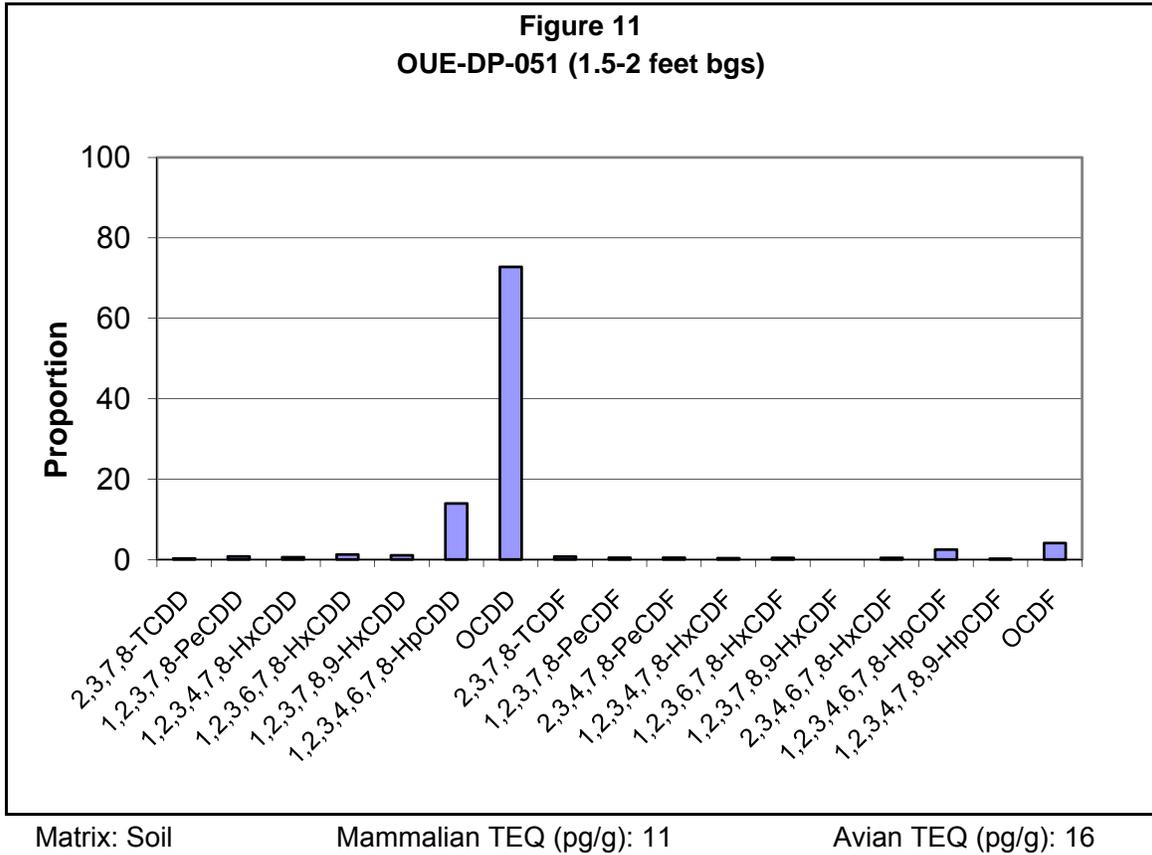


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-3
Dioxin Congener Profiles
Future Wetland Area Soil**

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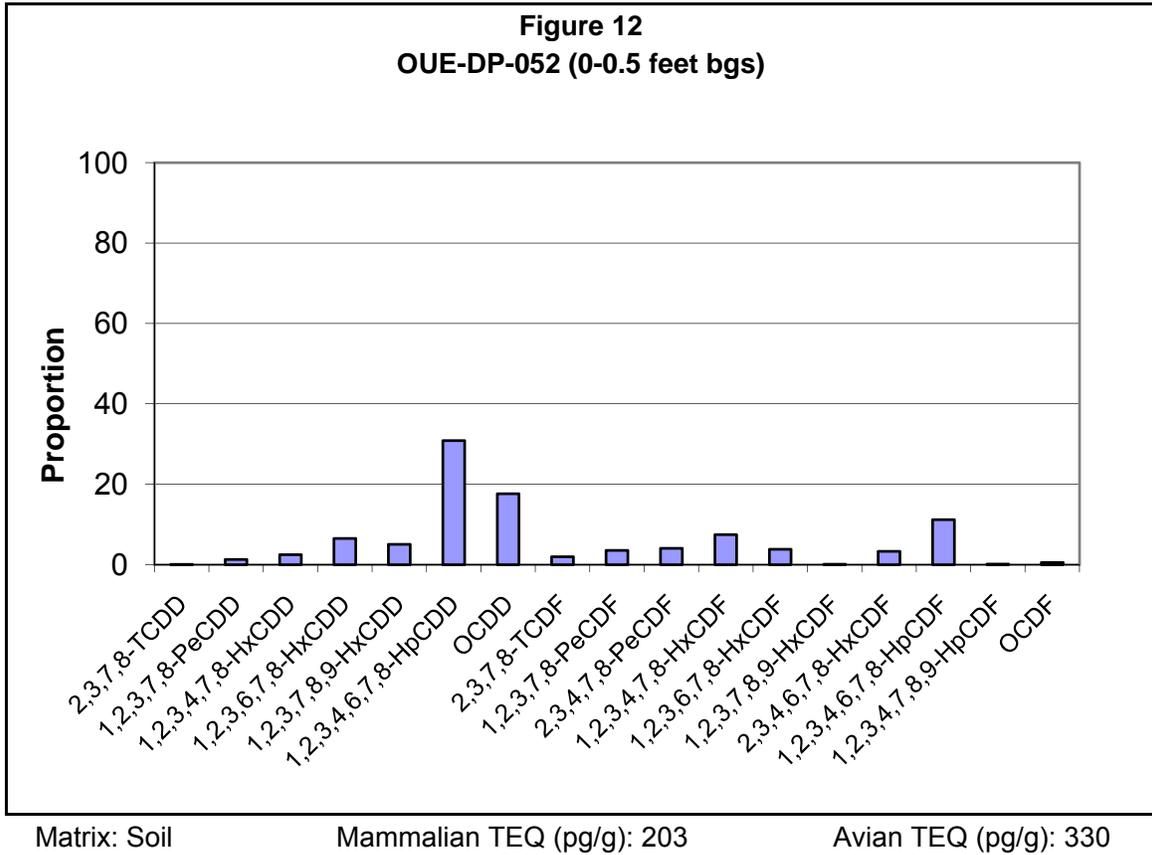


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, and/or waste wood ash.

**Attachment G-3
Dioxin Congener Profiles
Future Wetland Area Soil**

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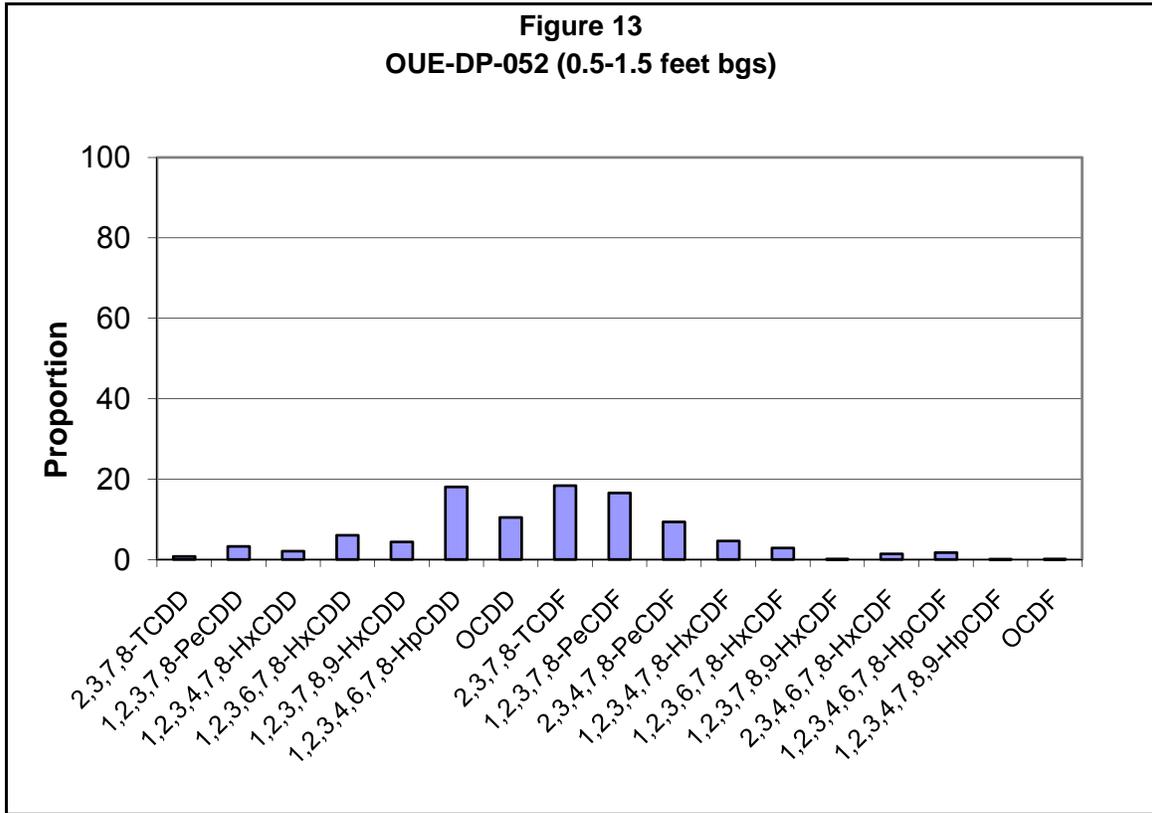


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

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Future Wetland Area Soil**

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Matrix: Soil

Mammalian TEQ (pg/g): 2729

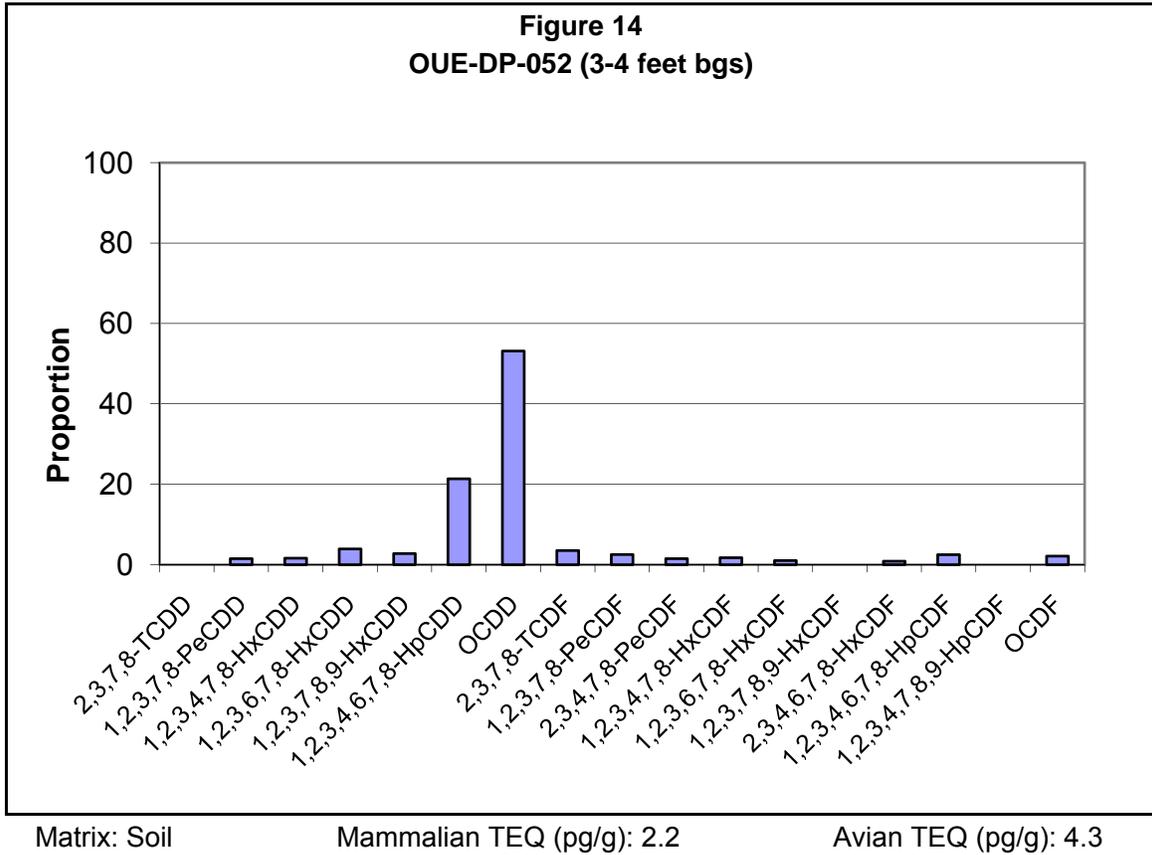
Avian TEQ (pg/g): 8299

Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-3
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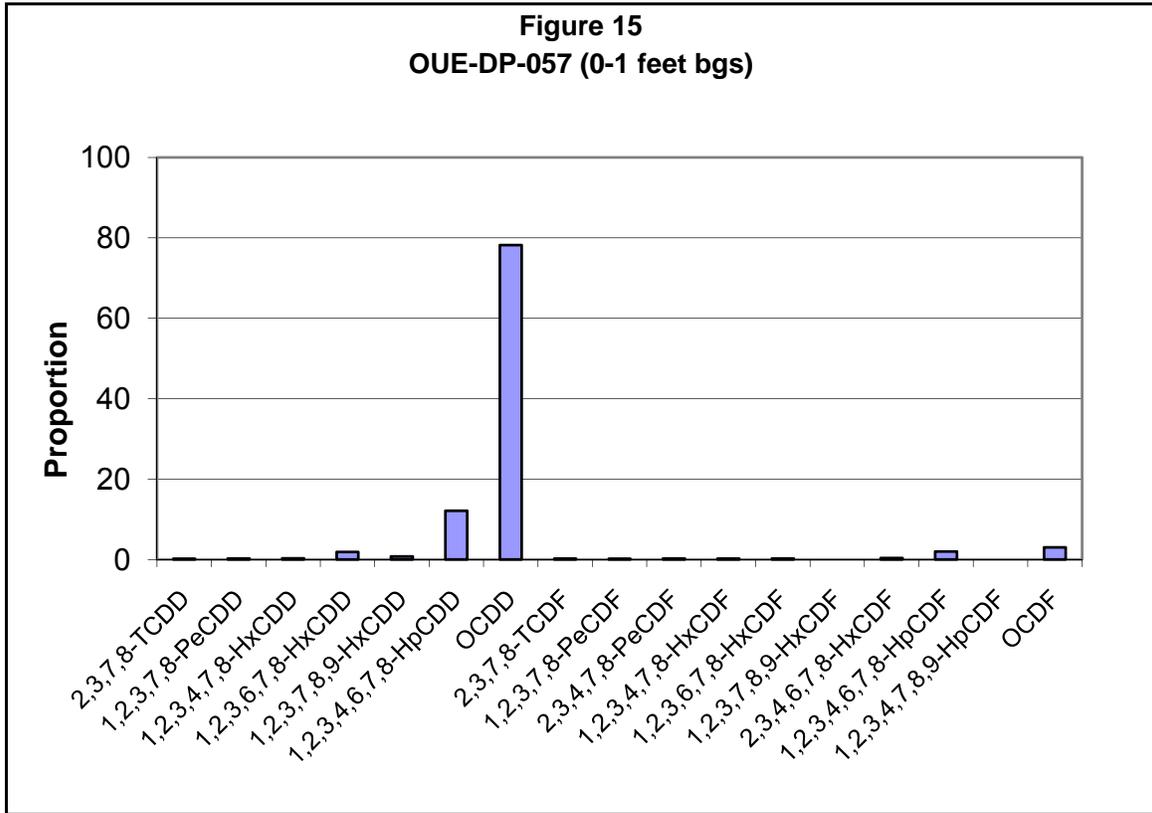


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

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Future Wetland Area Soil**

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Matrix: Soil

Mammalian TEQ (pg/g): 6.0

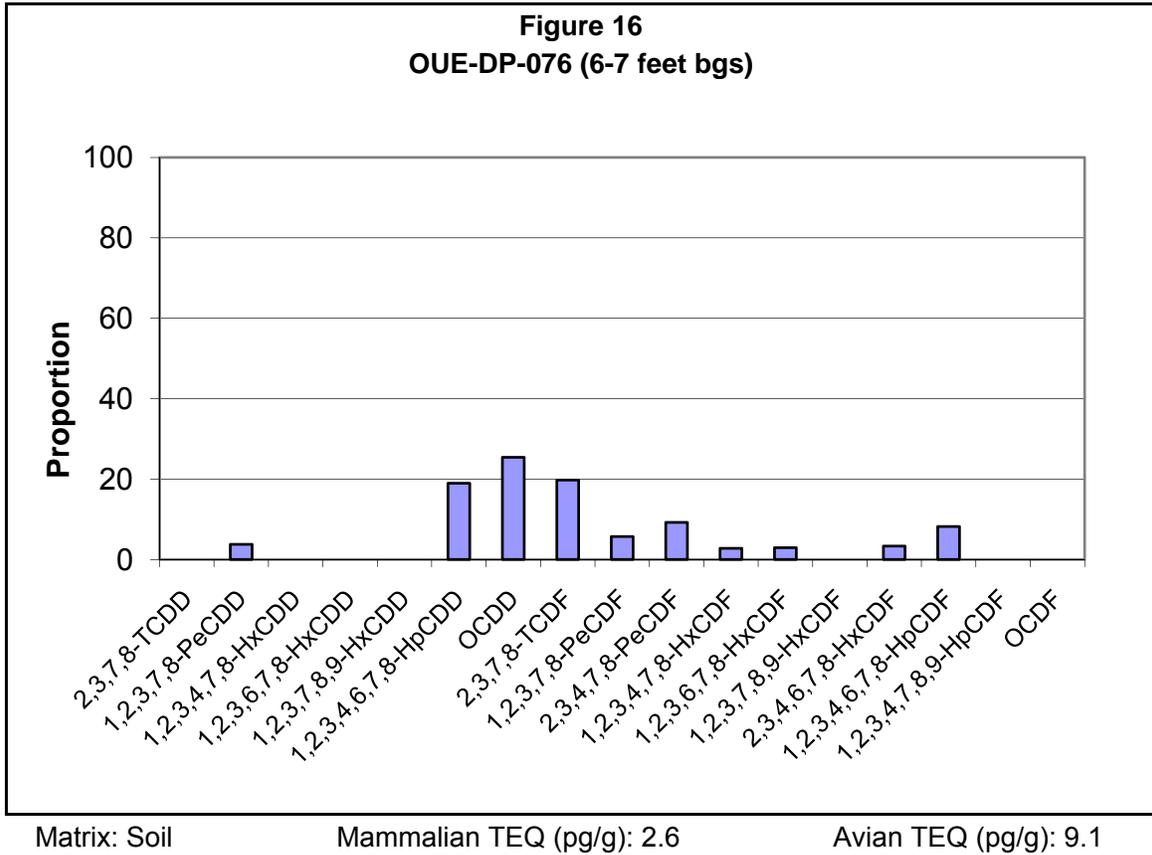
Avian TEQ (pg/g): 6.3

Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-3
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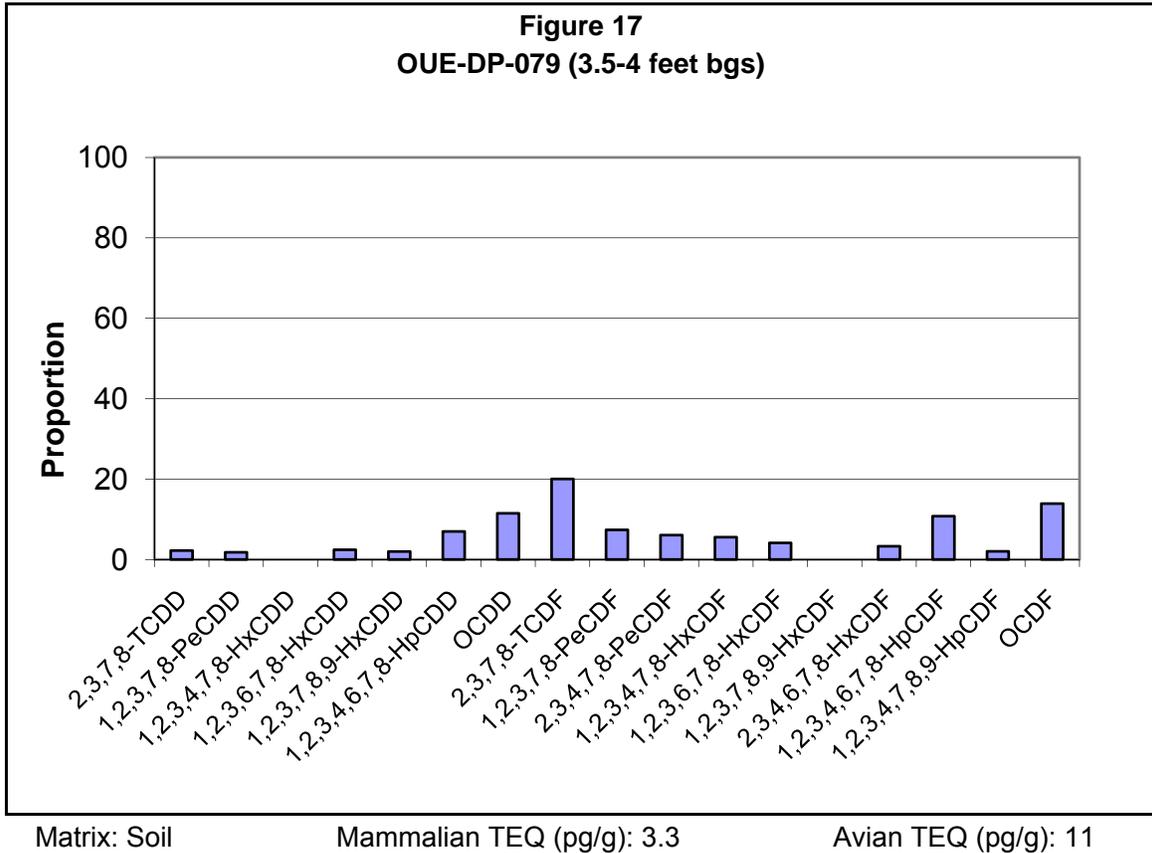


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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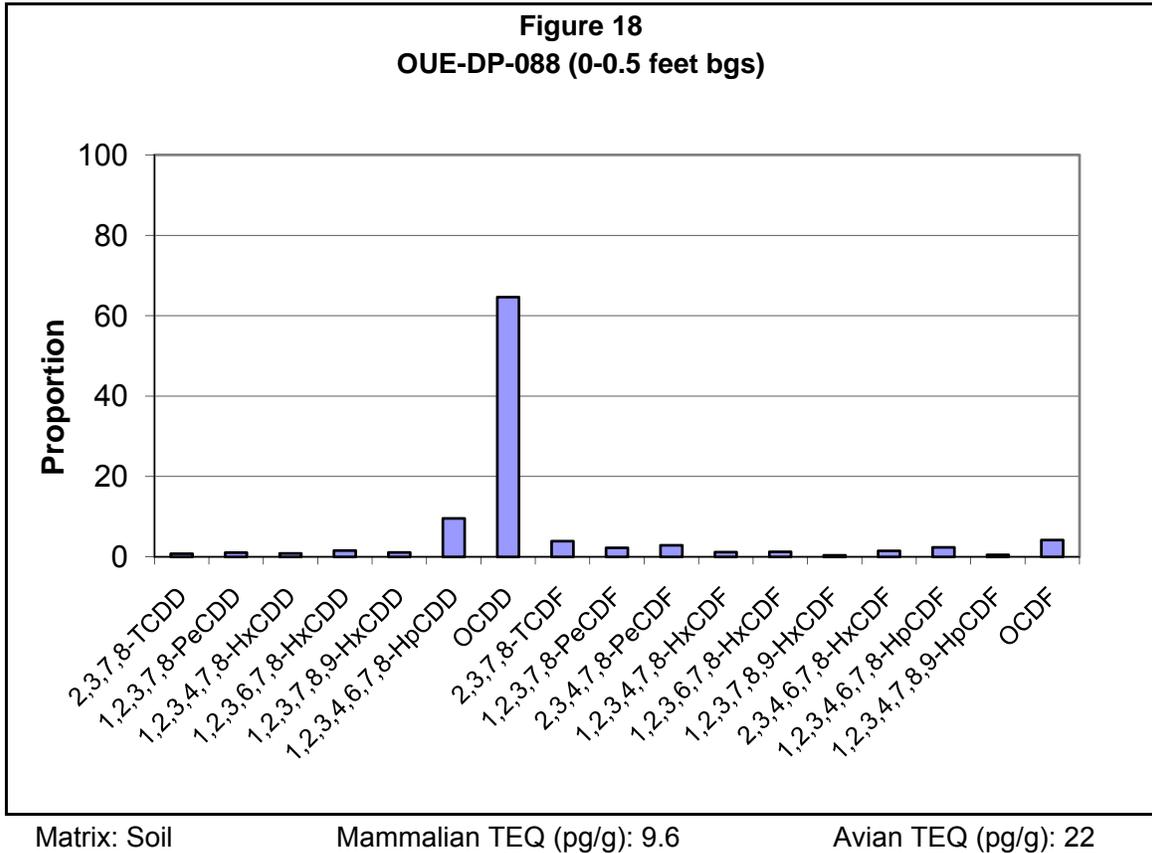


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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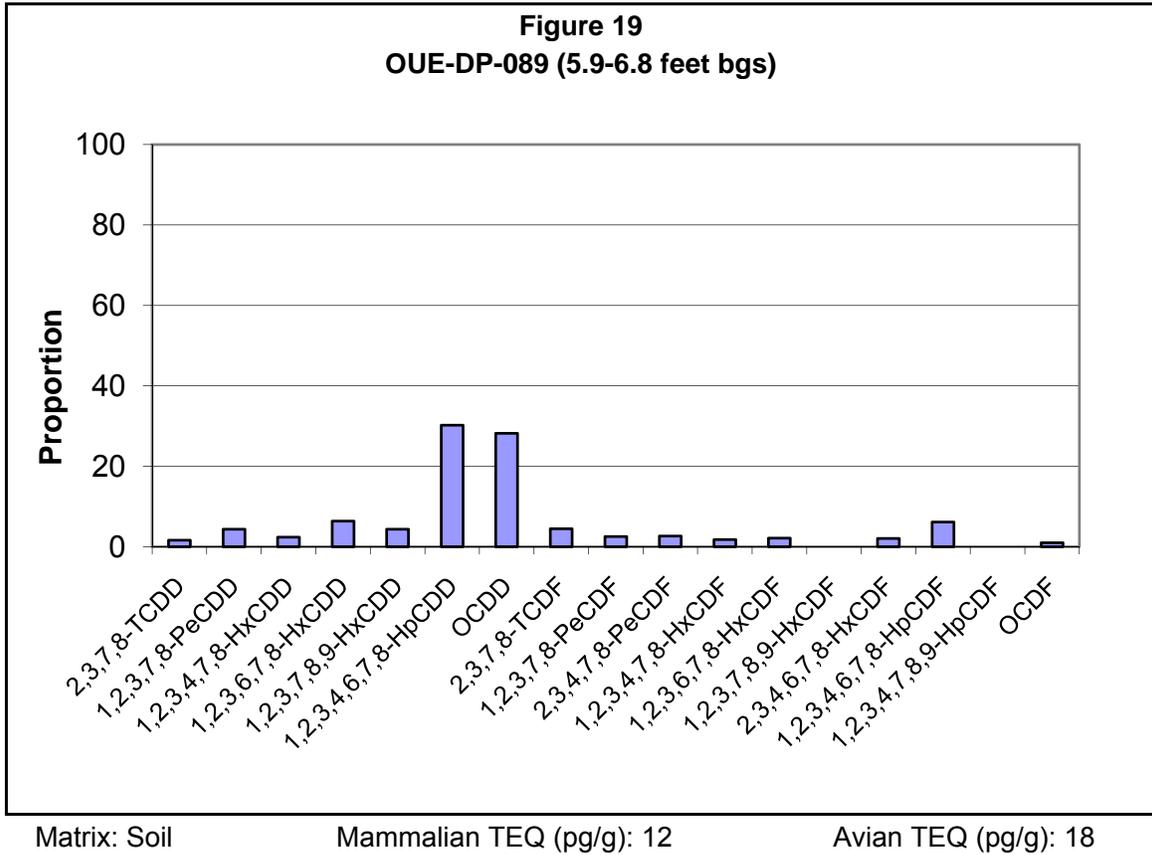


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, and/or waste wood ash.

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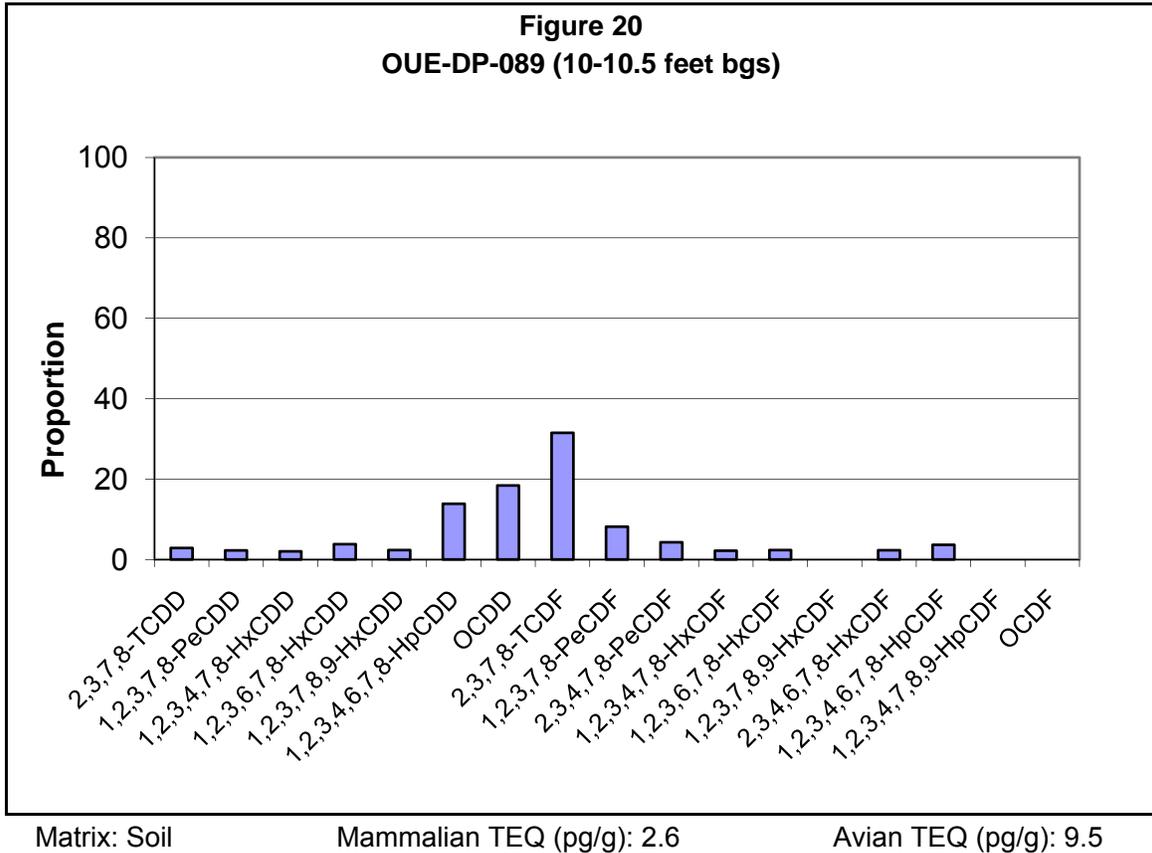


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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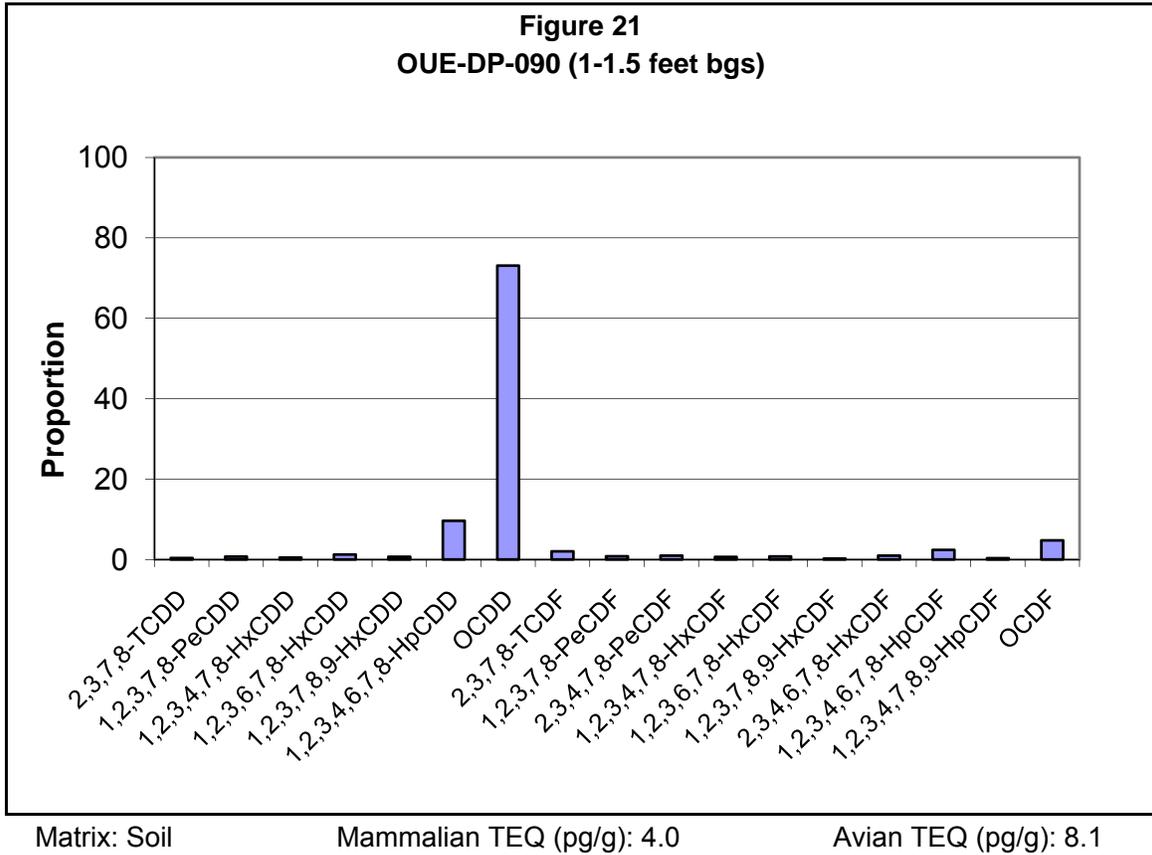


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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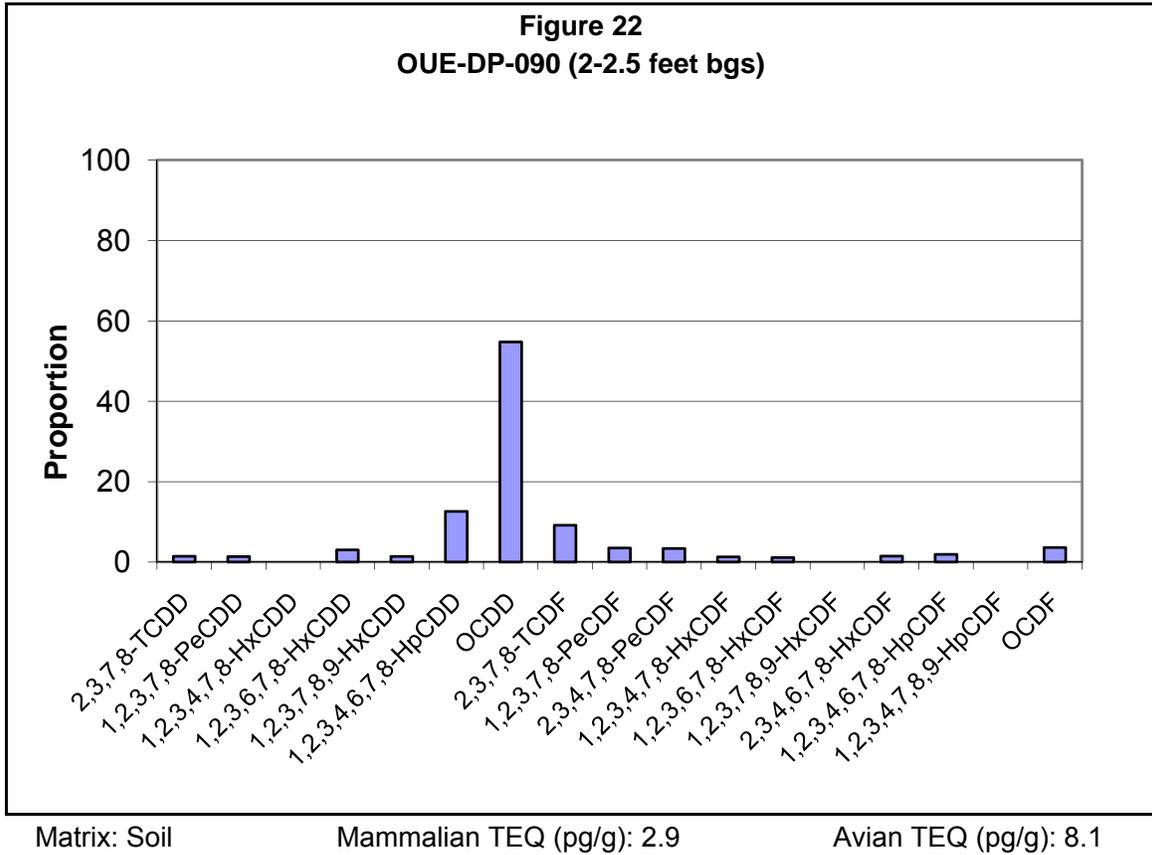


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-3
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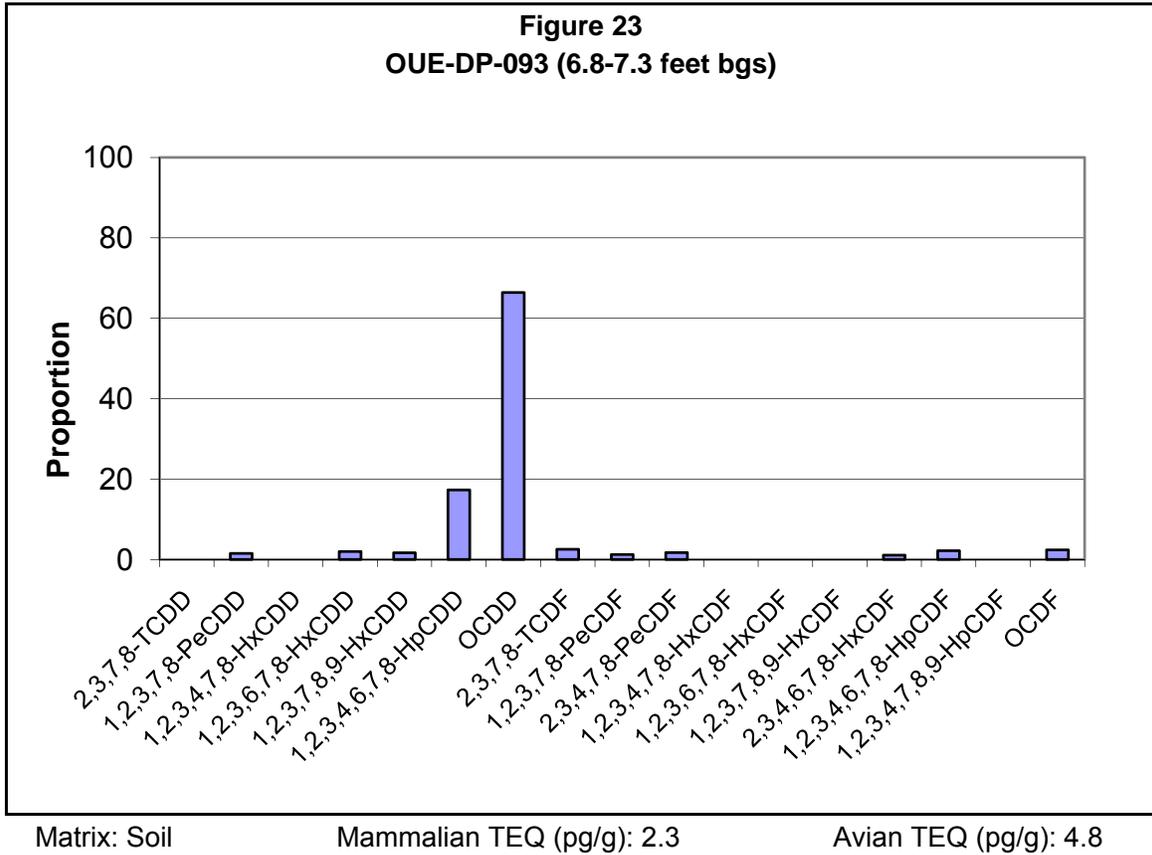


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

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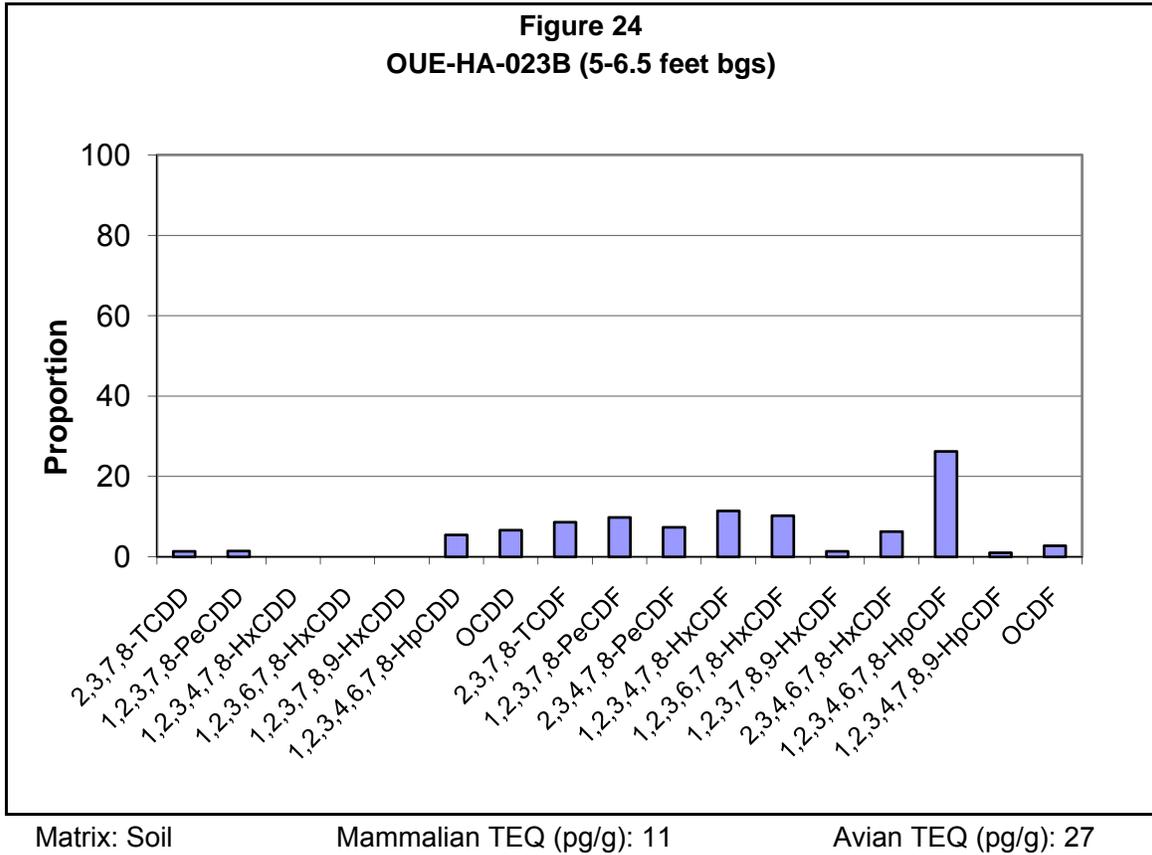


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

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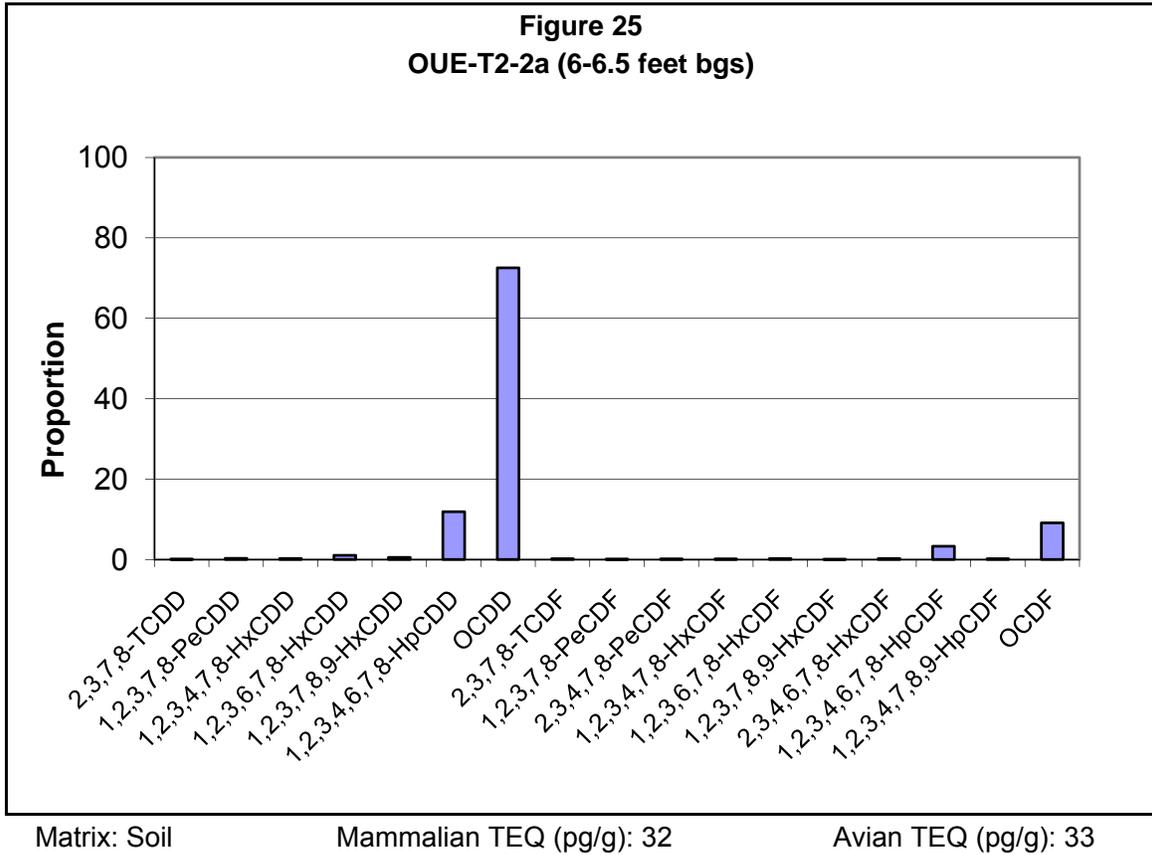


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

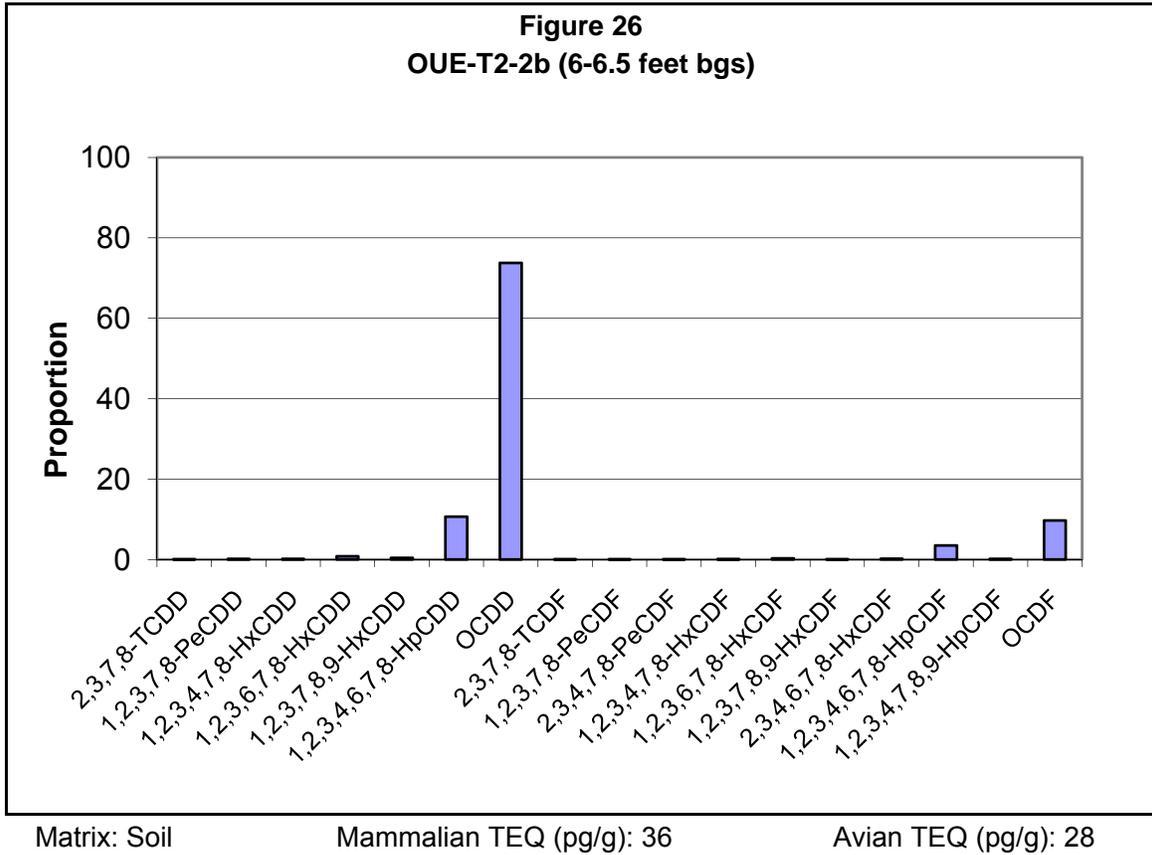


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$). The proportion of one additional congener is just slightly greater than the 1% threshold, but considered similar to ambient given the overall dioxin profile.

**Attachment G-3
Dioxin Congener Profiles
Future Wetland Area Soil**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-3
Dioxin Congener Profiles
Future Wetland Area Soil**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bgs = below ground surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

TEQ = toxic equivalent



Attachment G-4

Future Wetland Area Sediments
Dioxin Congener Profiles

Tables

Dioxin/Furan Source
Classifications

Attachment G-4
Table 1. Dioxin/Furan Source Classifications
Future Wetland Area Sediments

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

Location ID	Depth (ft bss)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
North Pond						
DP-4.7 *	0 to 0.5 ft	4/17/06	DP-4.7-1b	6.3	19	no category
DP-4.7	19 to 19.5 ft	4/17/06	DP-4.7-20b	90	307	muni
North Pond-01	0 to 0.5 ft	3/19/08	NP-01SED-SH-0-0.5	8.5	9.9	ambient
Pond 6						
DP-4.10	0 to 0.5 ft	4/18/06	DP-4.10-11	175	634	muni
Pond6-01	0.5 to 1.5 ft	3/11/08	PD6-01SED-VC-0.5-1.5	16	30	ambient
Pond6-02	0 to 0.5 ft	3/18/08	PD6-02SED-PD-0-0.5	56	164	mixture
Pond6-02	0.5 to 1.5 ft	3/12/08	PD6-02SED-VC-0.5-1.5	103	344	mixture
Pond6-02	1.5 to 2.5 ft	3/12/08	PD6-02SED-VC-1.5-2.5	141	440	mixture
Pond6-02	2.5 to 3.5 ft	3/12/08	PD6-02SED-VC-2.5-3.5	168	497	mixture
Pond6-02	4.5 to 5.5 ft	3/12/08	PD6-02SED-VC-4.5-5.5	165	561	muni
Pond 7						
DP-4.11	6 to 6.5 ft	4/17/06	DP-4.11-13	1418	3220	muni
DP-4.12	6 to 6.5 ft	4/18/06	DP-4.12-13	1483	3408	muni
DP-4.13	0 to 0.5 ft	4/18/06	DP-4.13-6	753	1734	muni
Pond7-01	0 to 0.5 ft	3/18/08	PD7-01SED-PD-0-0.5	1184	2731	muni
Pond7-01	0.5 to 1.5 ft	3/12/08	PD7-01SED-VC-0.5-1.5	1349	3065	muni
Pond7-02	0 to 0.5 ft	3/18/08	PD7-02SED-PD-0-0.5	1227	2800	muni
Pond7-02	0.5 to 1.5 ft	3/12/08	PD7-02SED-VC-0.5-1.5	1688	3668	muni
Pond7-02	1.5 to 2.5 ft	3/12/08	PD7-02SED-VC-1.5-2.5	1626	3537	muni
Pond7-02	2.5 to 3.5 ft	3/12/08	PD7-02SED-VC-2.5-3.5	1518	3425	muni
Pond7-02	4.5 to 5.5 ft	3/12/08	PD7-02SED-VC-4.5-5.5	212	658	mixture
Pond7-02	5.5 to 6.5 ft	3/12/08	PD7-02SED-VC-5.5-6.5	253	635	muni

Notes:

ambient = congener profile consistent with ambient dioxin/furans.

mixture = congener profile consistent with multiple sources of dioxin/furans.

muni = congener profile consistent with dioxin/furans from (municipal) waste wood incineration.

* This sample was not classified due to low frequency of detection of the congeners and somewhat elevated proportion 2,3,7,8-tetrachlorinated dibenzodioxin. This sample was previously classified as ambient in the OU-E Pond Sediment F

Acronyms and Abbreviations:

bss = below sediment surface

ft = feet/foot

pg/g = picograms per gram

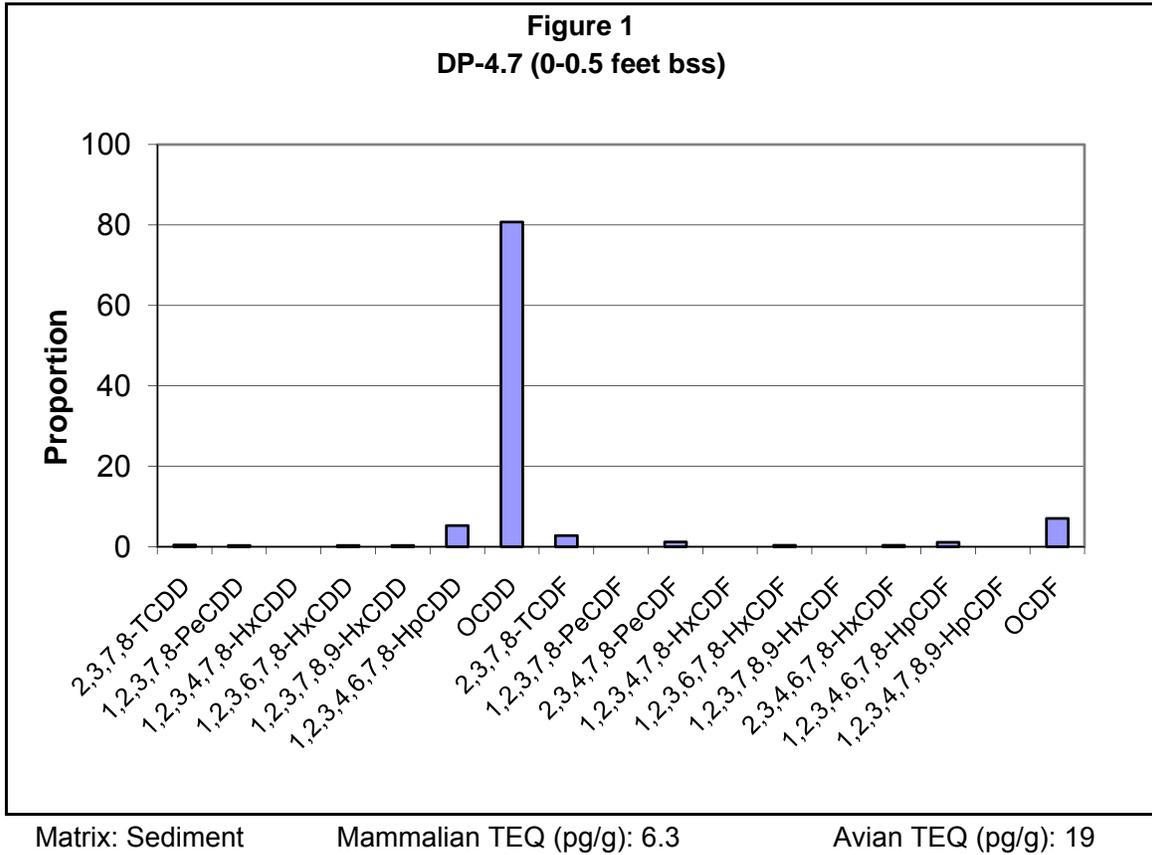
TEQ = toxic equivalent

Figures – North Pond

Dioxin Congener Profiles: Future
Wetland Area Sediments

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - North Pond**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

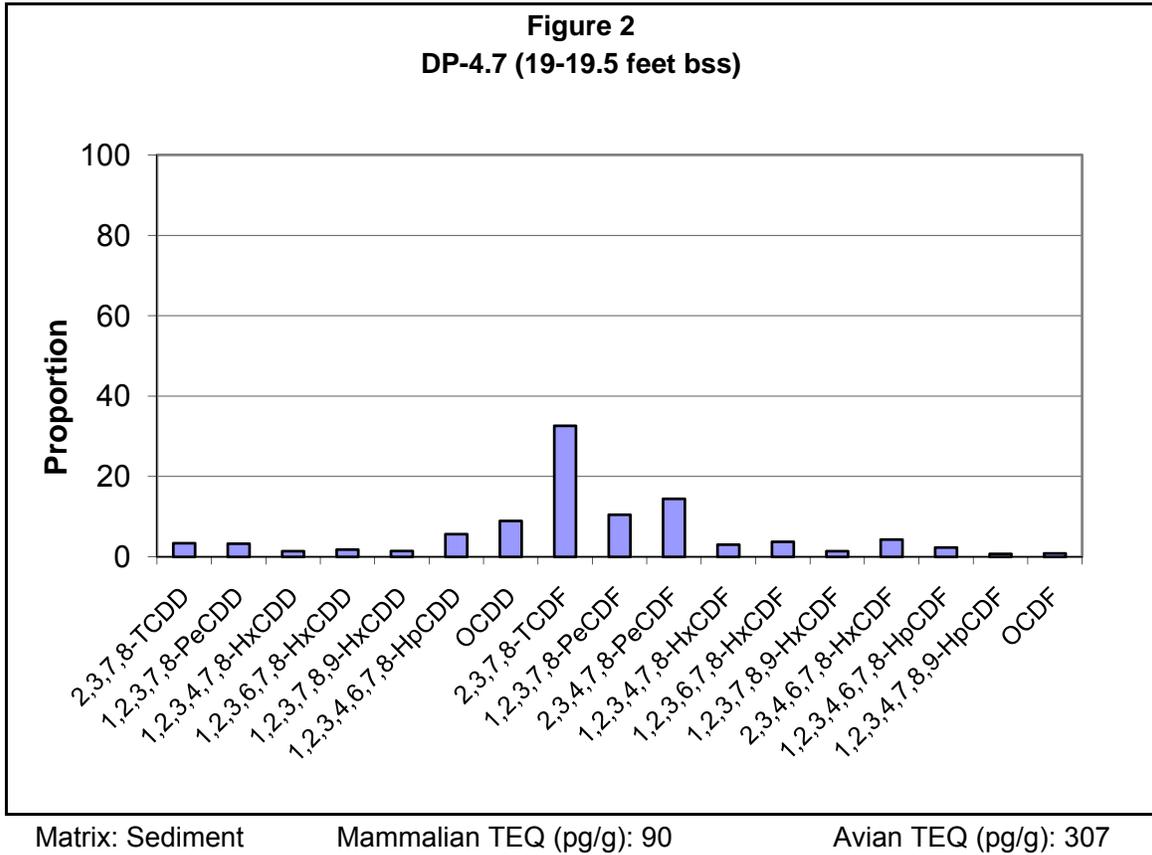


Category based on visual inspection of dioxin profile: no category

Inconsistent with any source profile; dioxin profile obscured by low detection frequency of congeners.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - North Pond**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

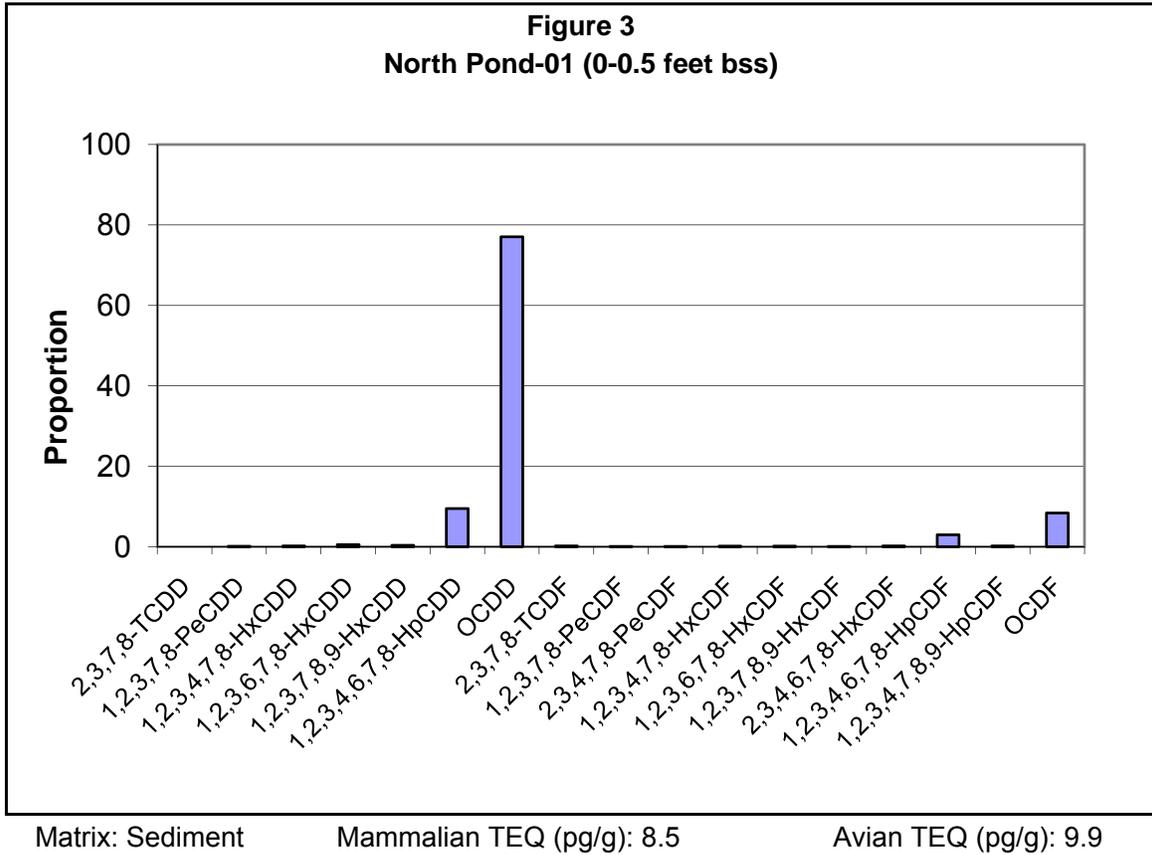


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - North Pond**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - North Pond**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

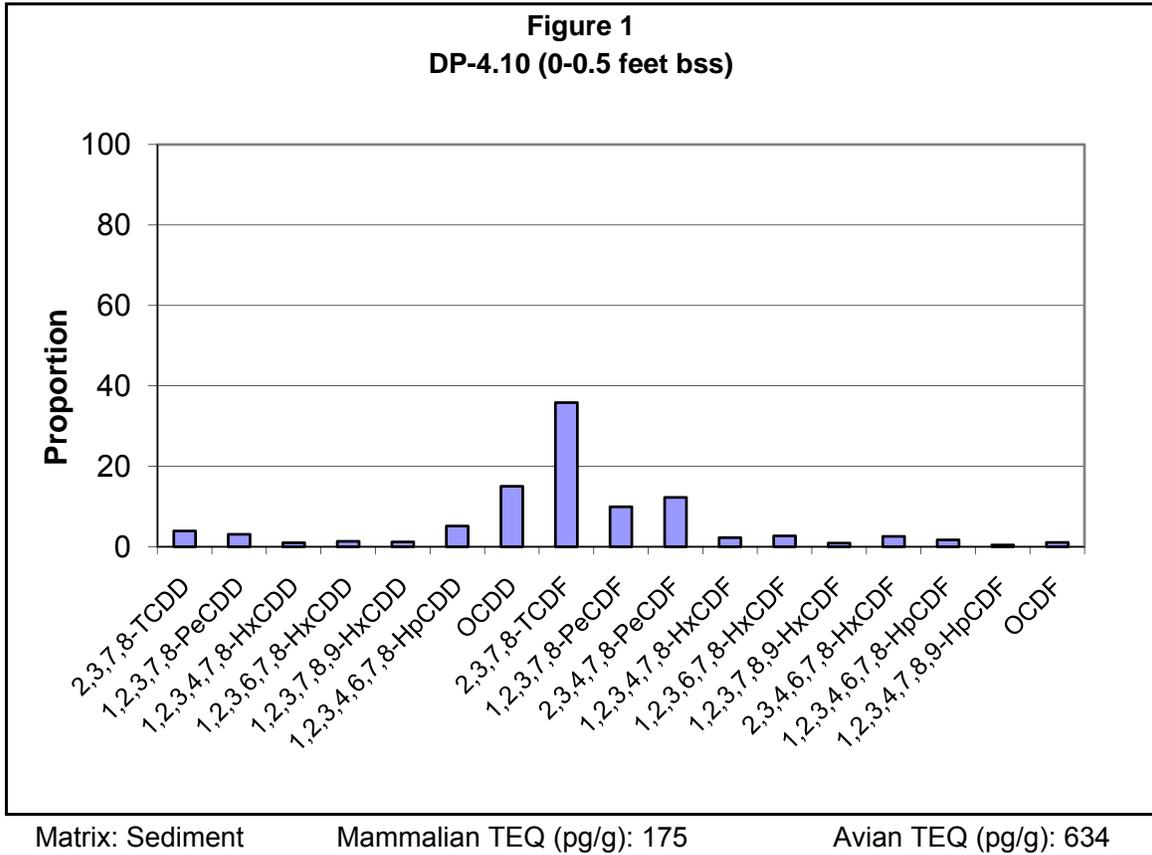
TEQ = toxic equivalent

Figures – Pond 6

Dioxin Congener Profiles: Future
Wetland Area Sediments – Pond 6

Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

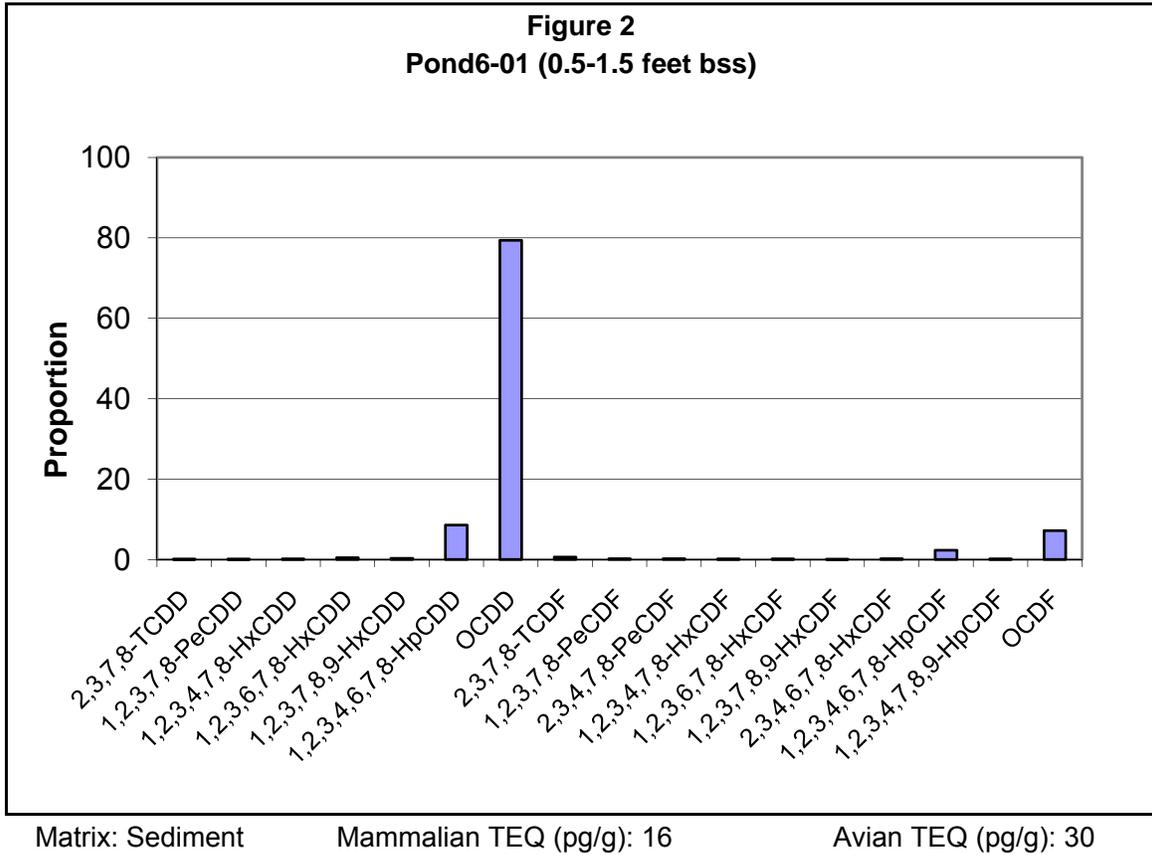


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

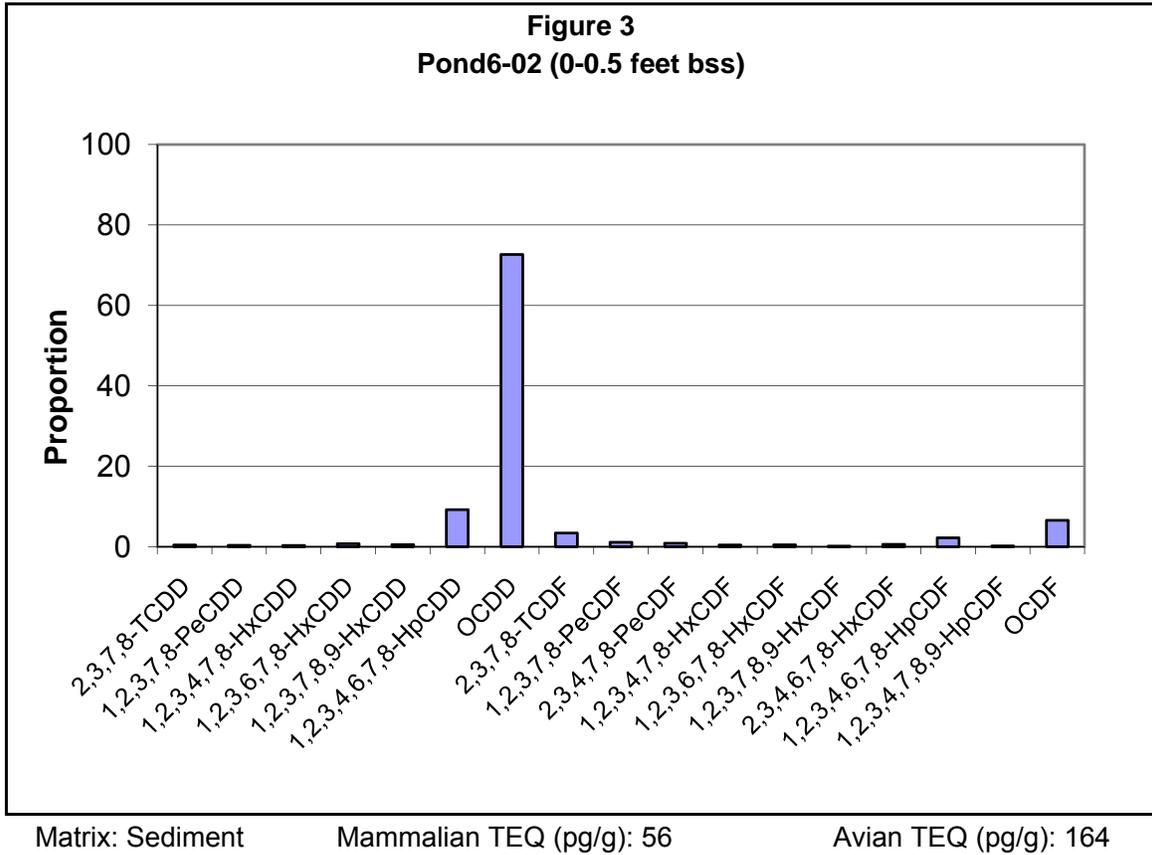


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

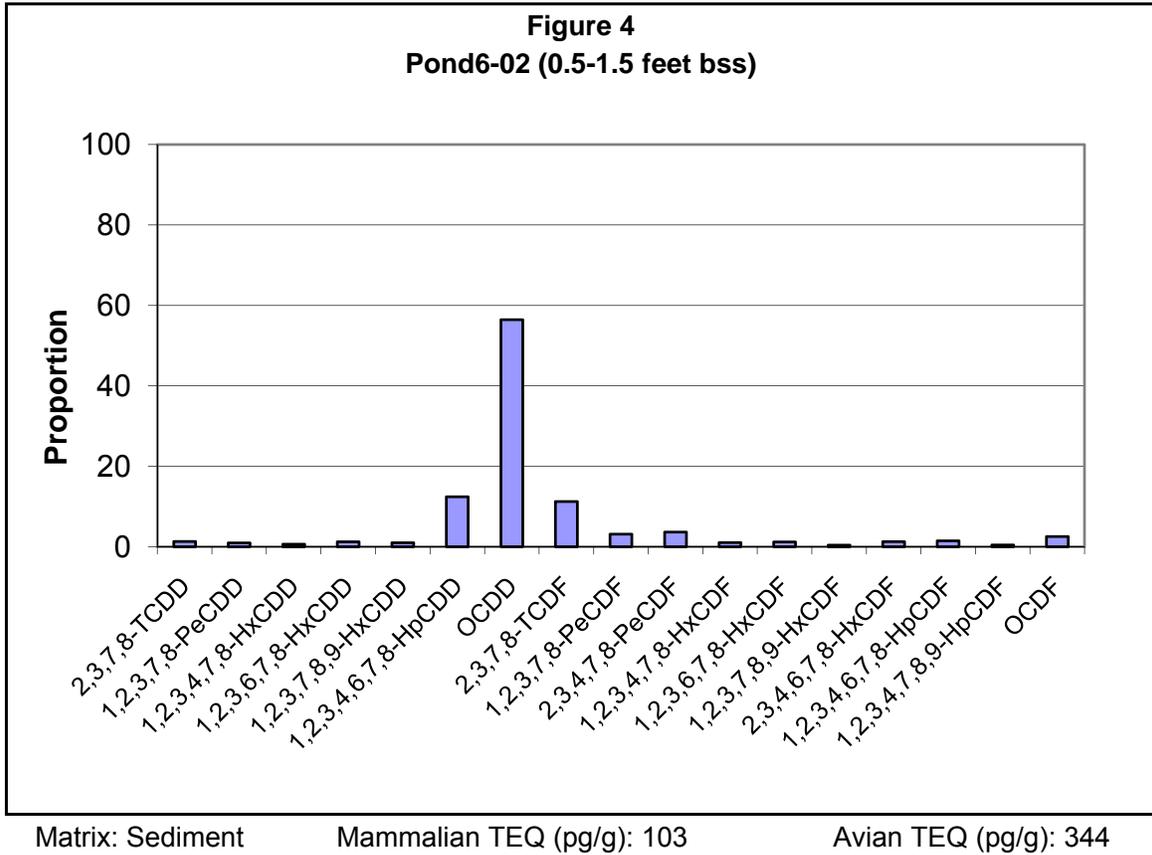


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash, and/or other sources.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

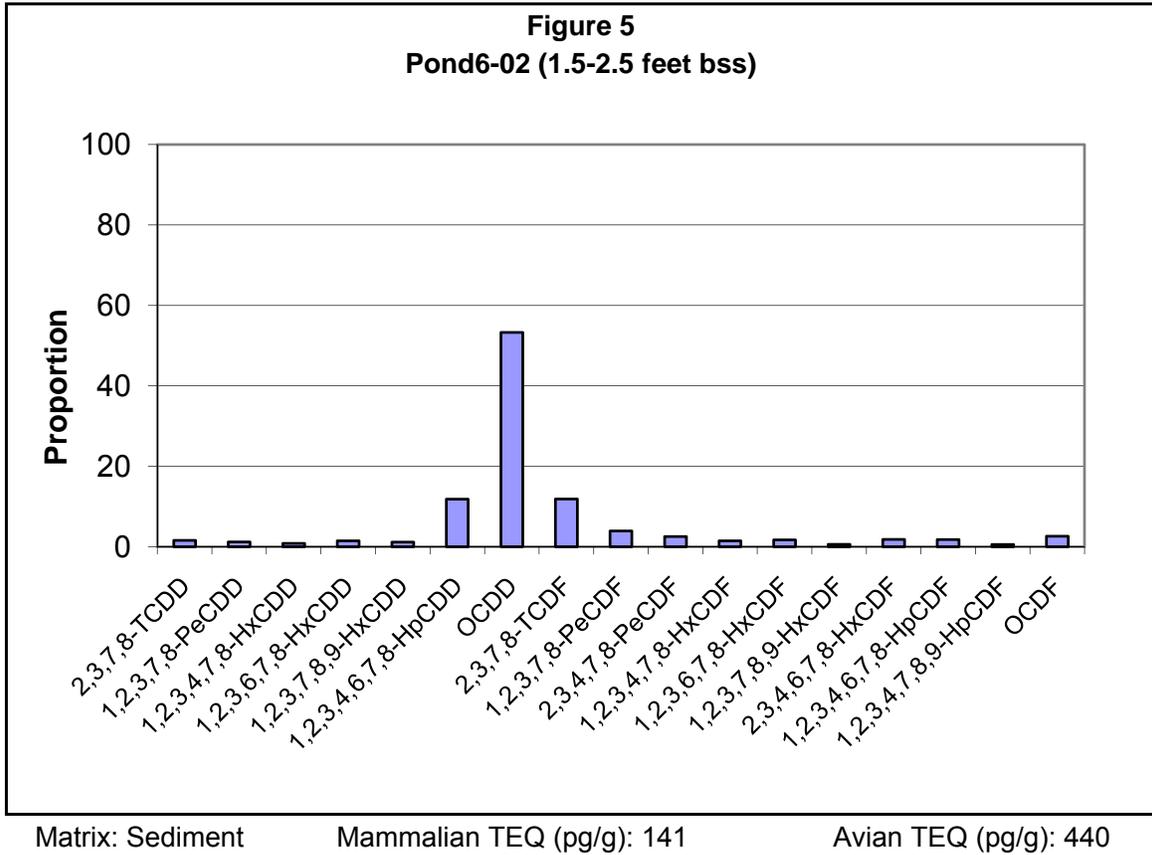


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

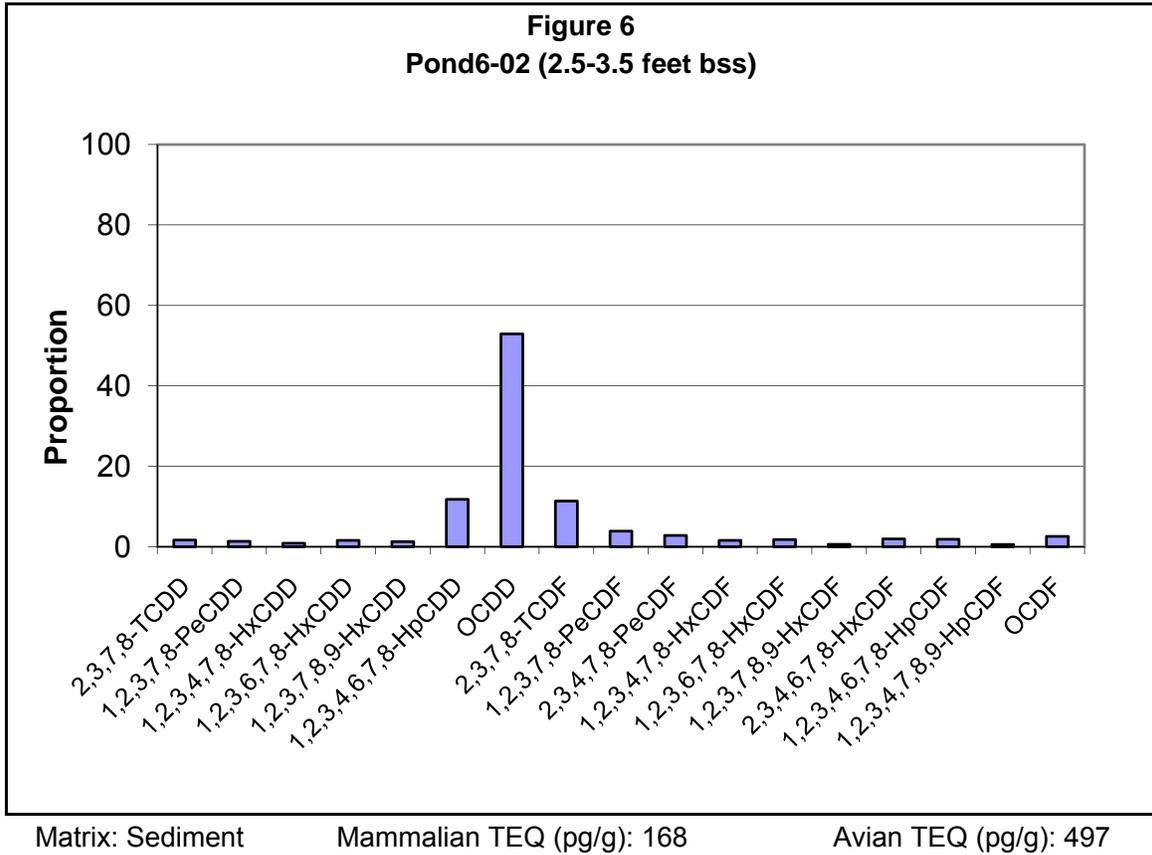


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

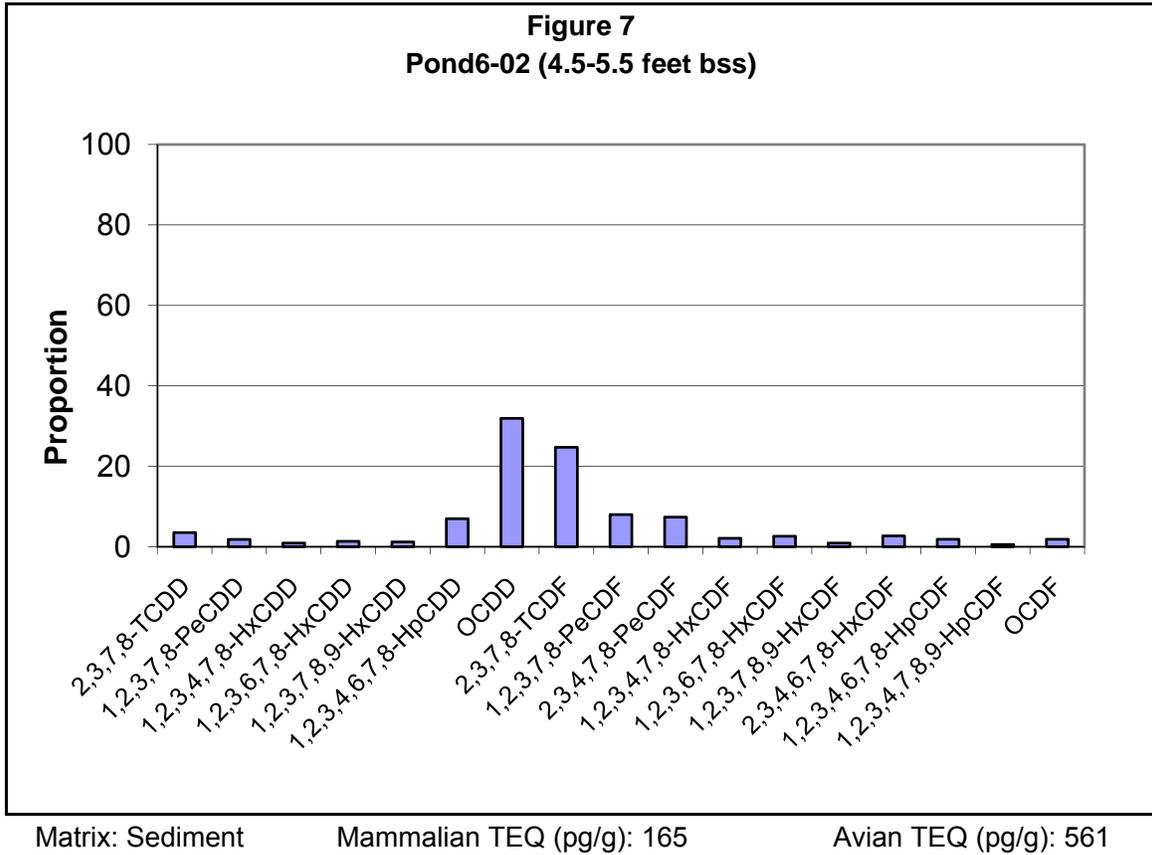


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 6**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

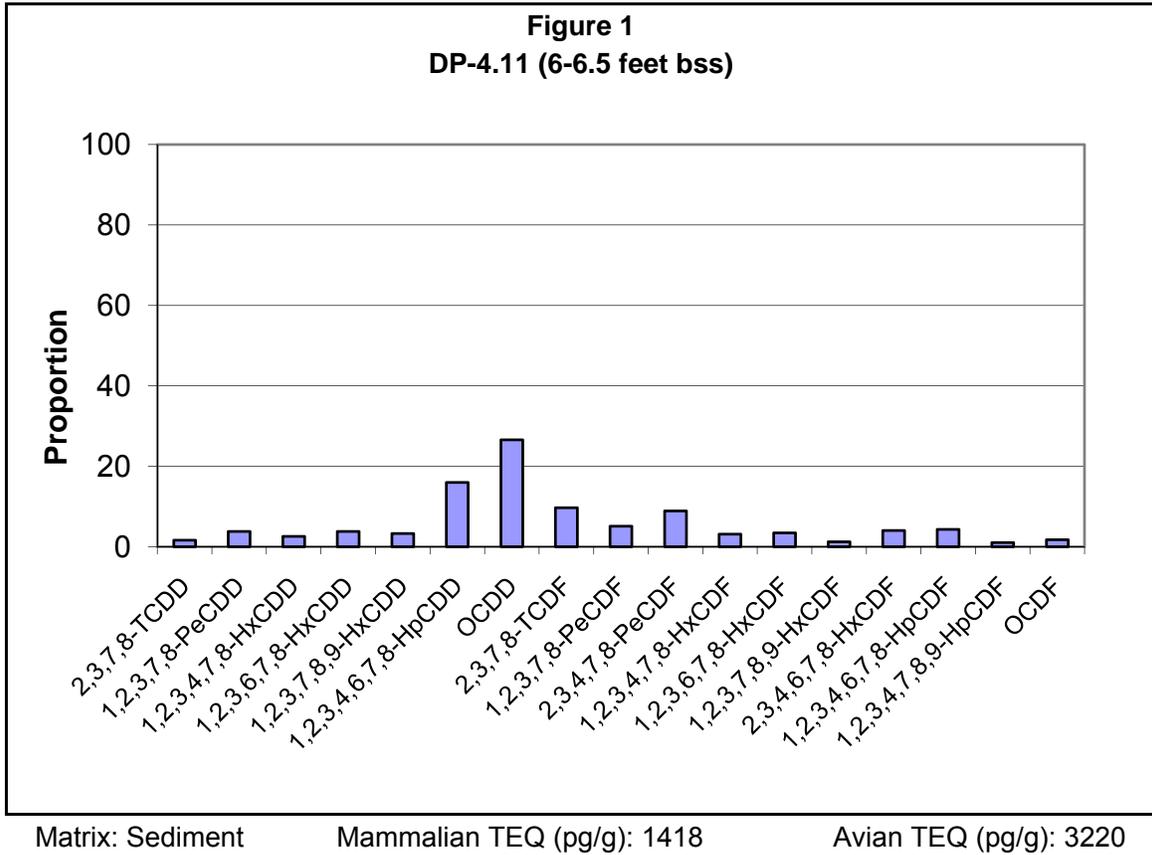
TEQ = toxic equivalent

Figures – Pond 7

Dioxin Congener Profiles: Future
Wetland Area Sediments – Pond 7

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

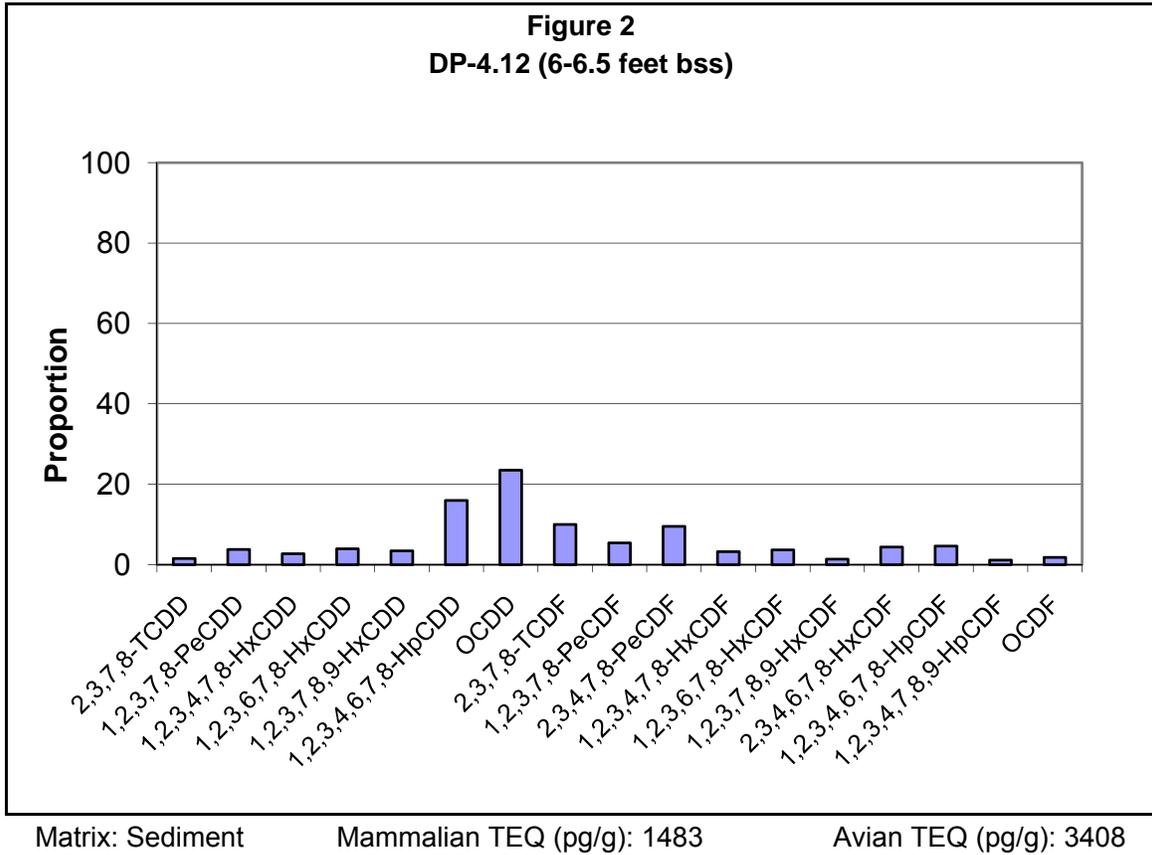


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF (≥5%); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners (≥1.5%).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

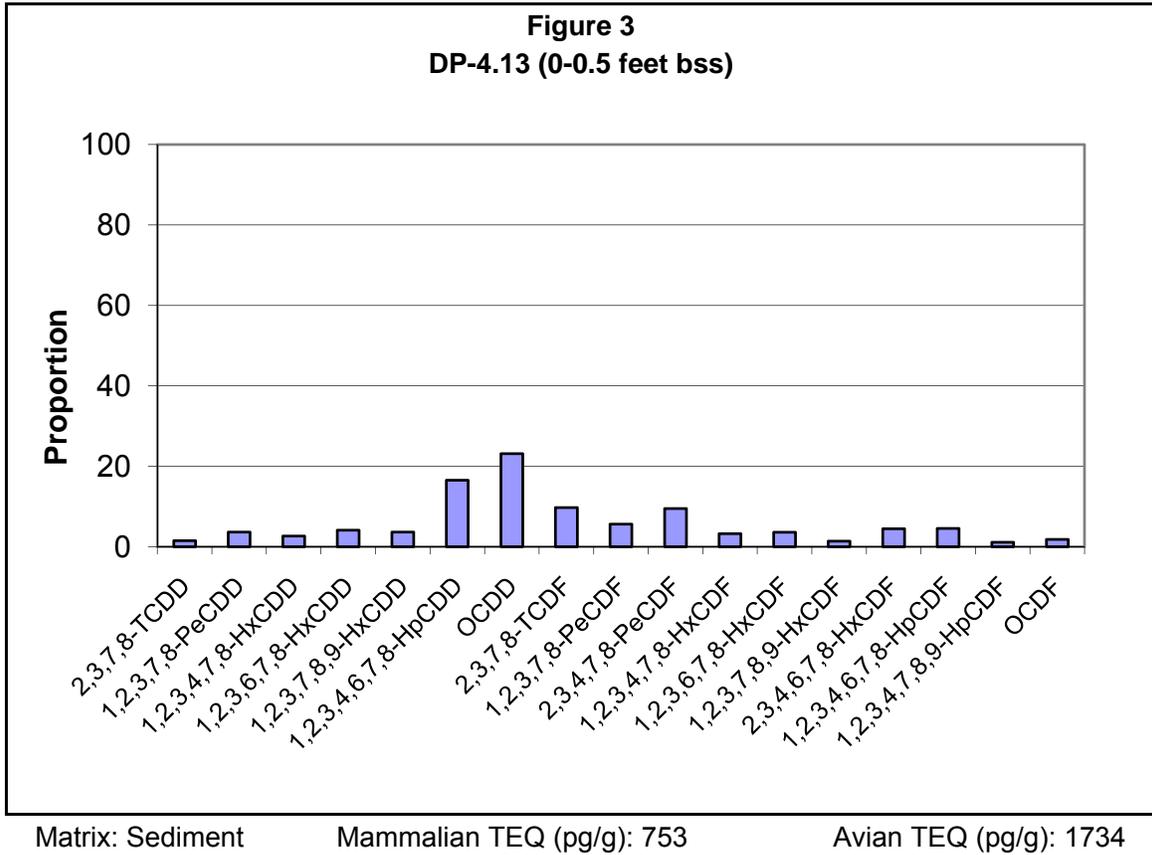


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

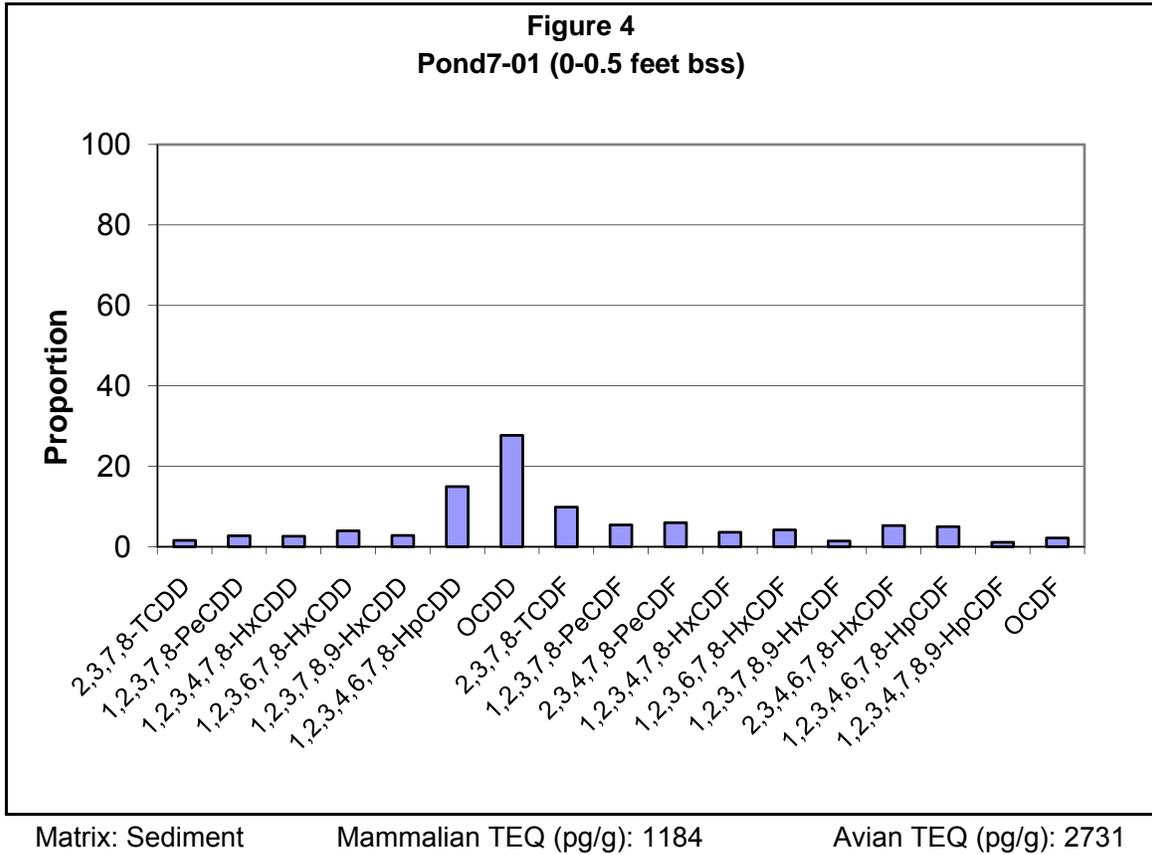


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF (≥5%); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners (≥1.5%).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

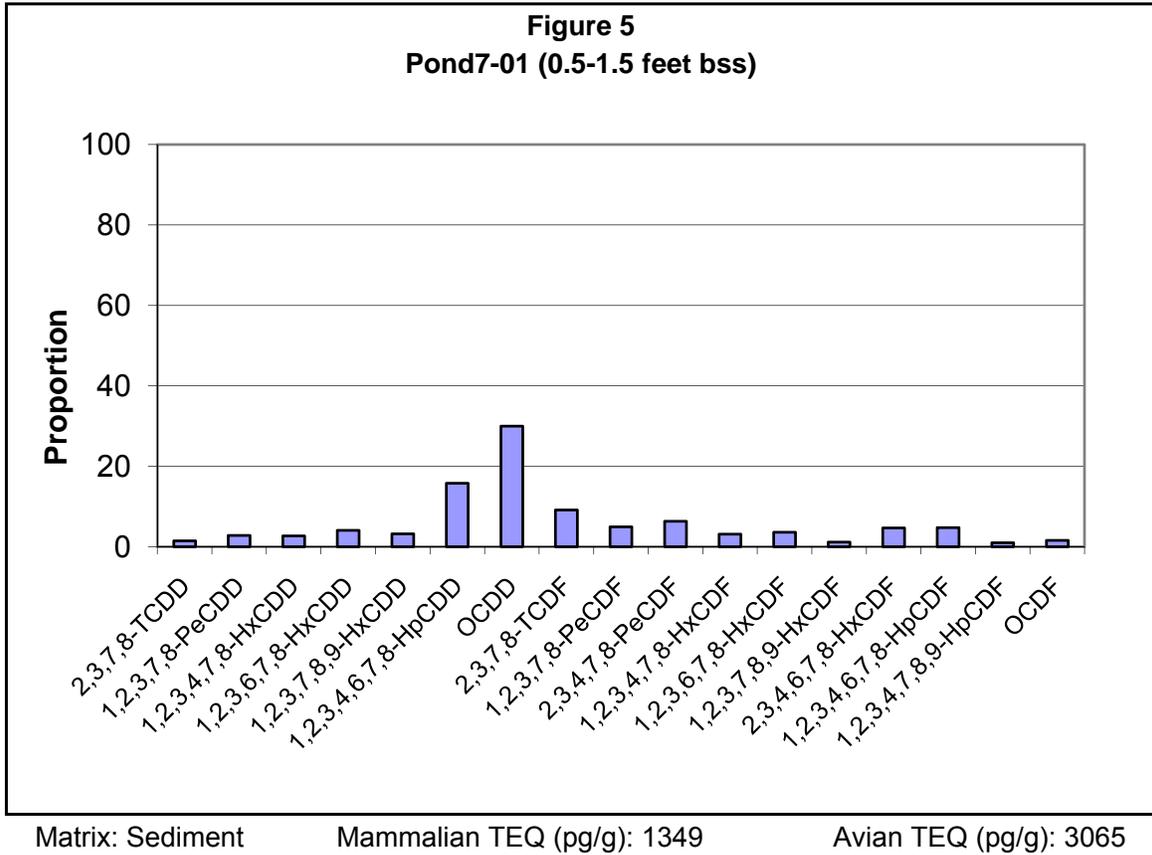


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

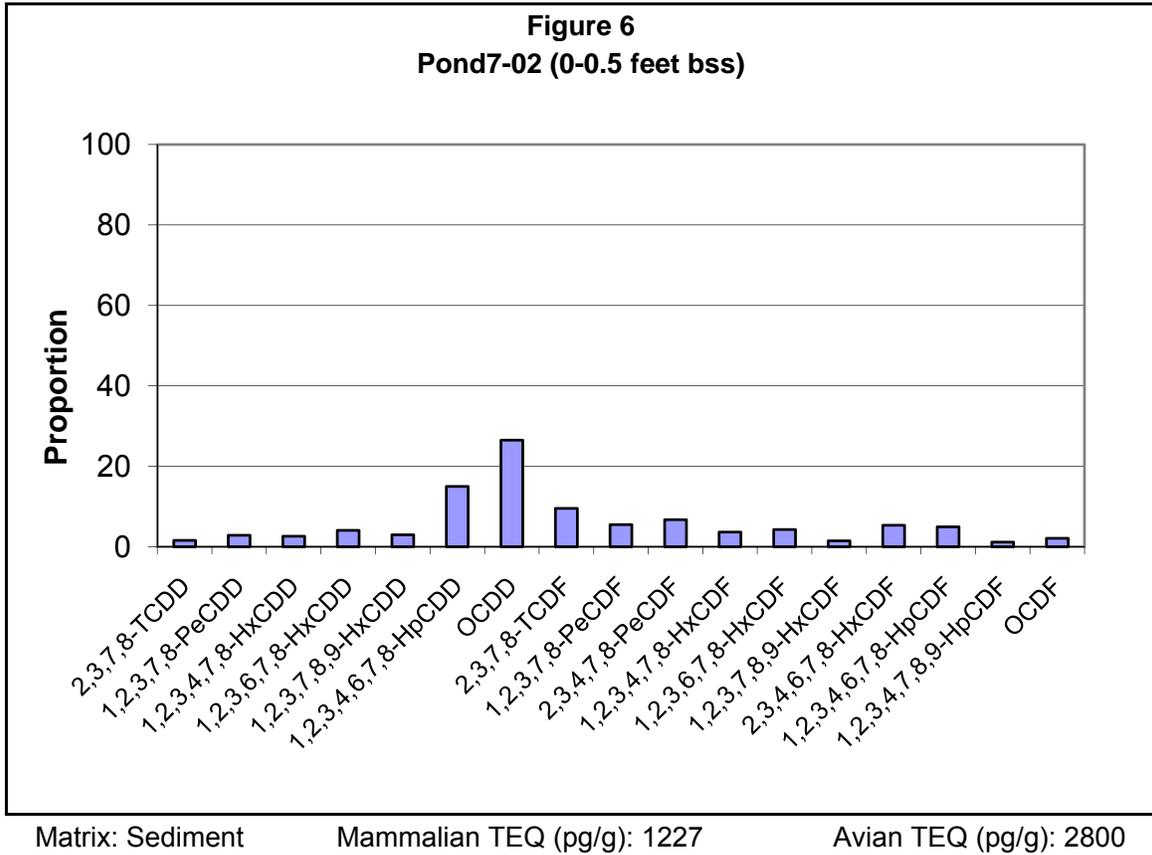


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

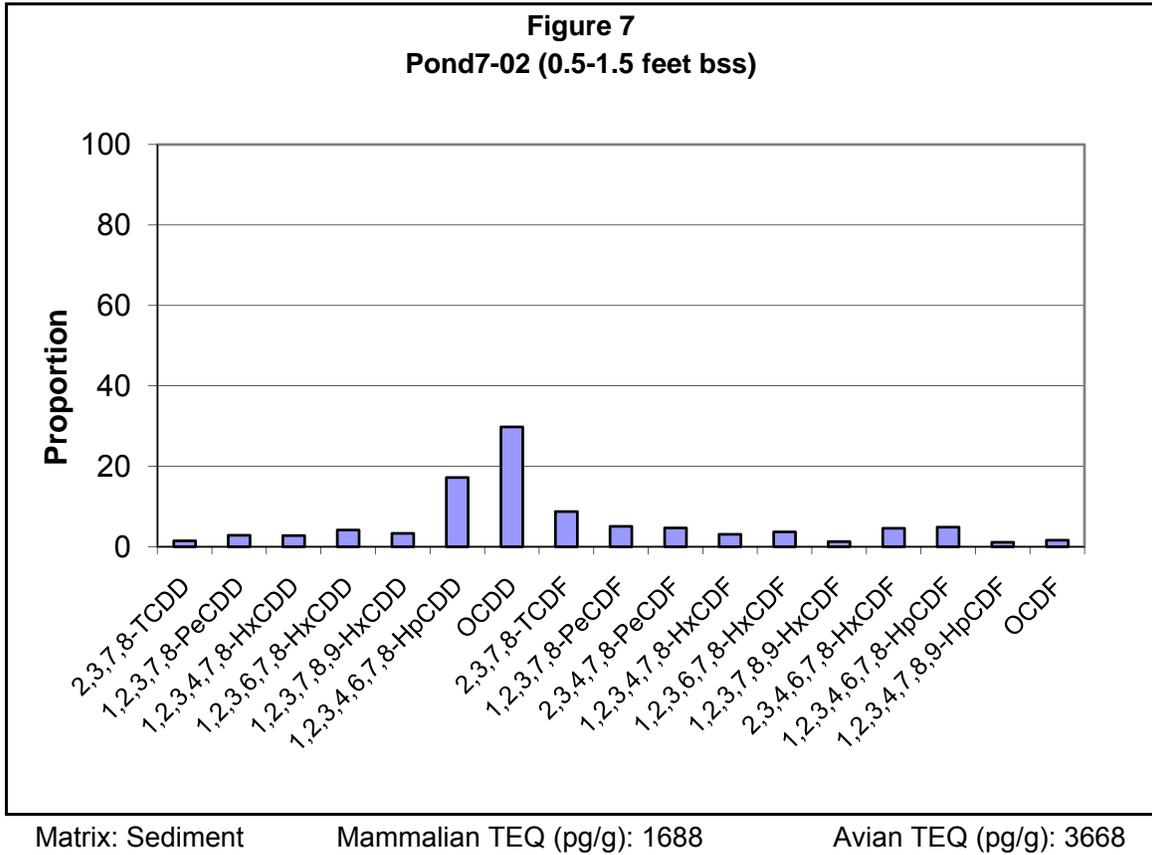


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF (≥5%); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners (≥1.5%).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

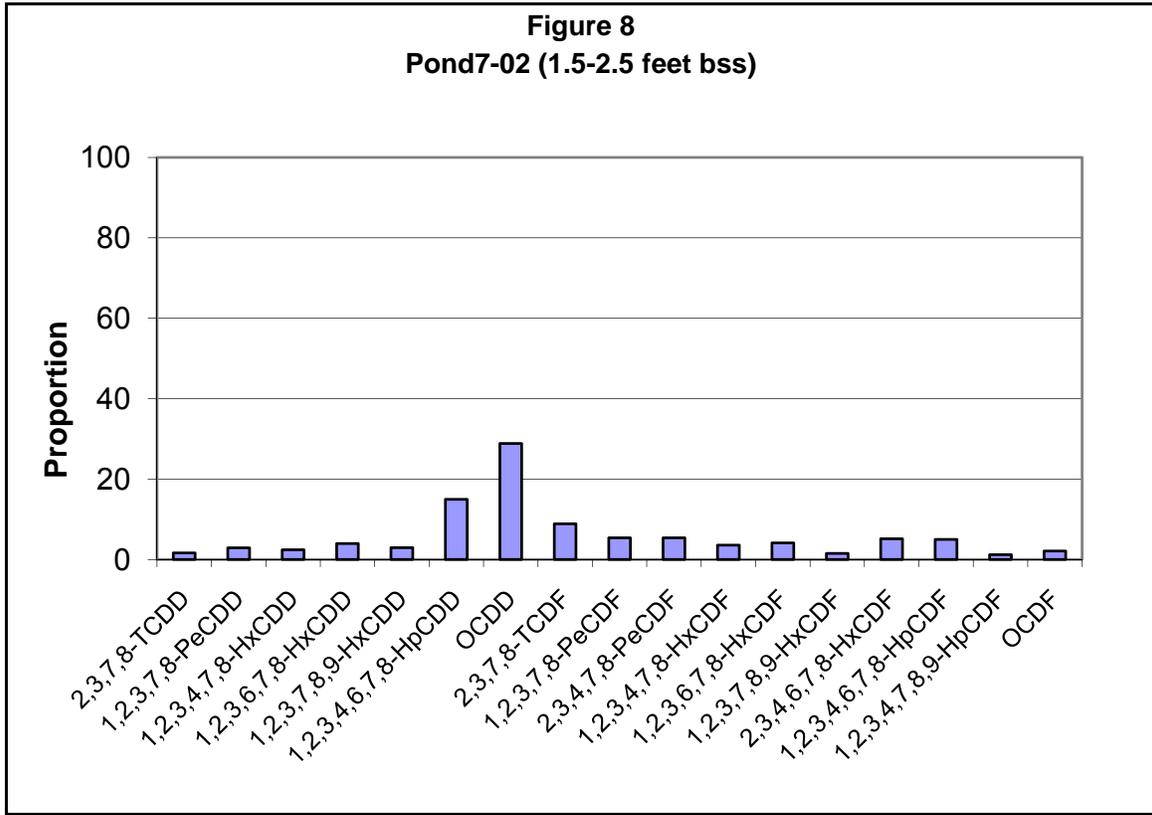


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Matrix: Sediment

Mammalian TEQ (pg/g): 1626

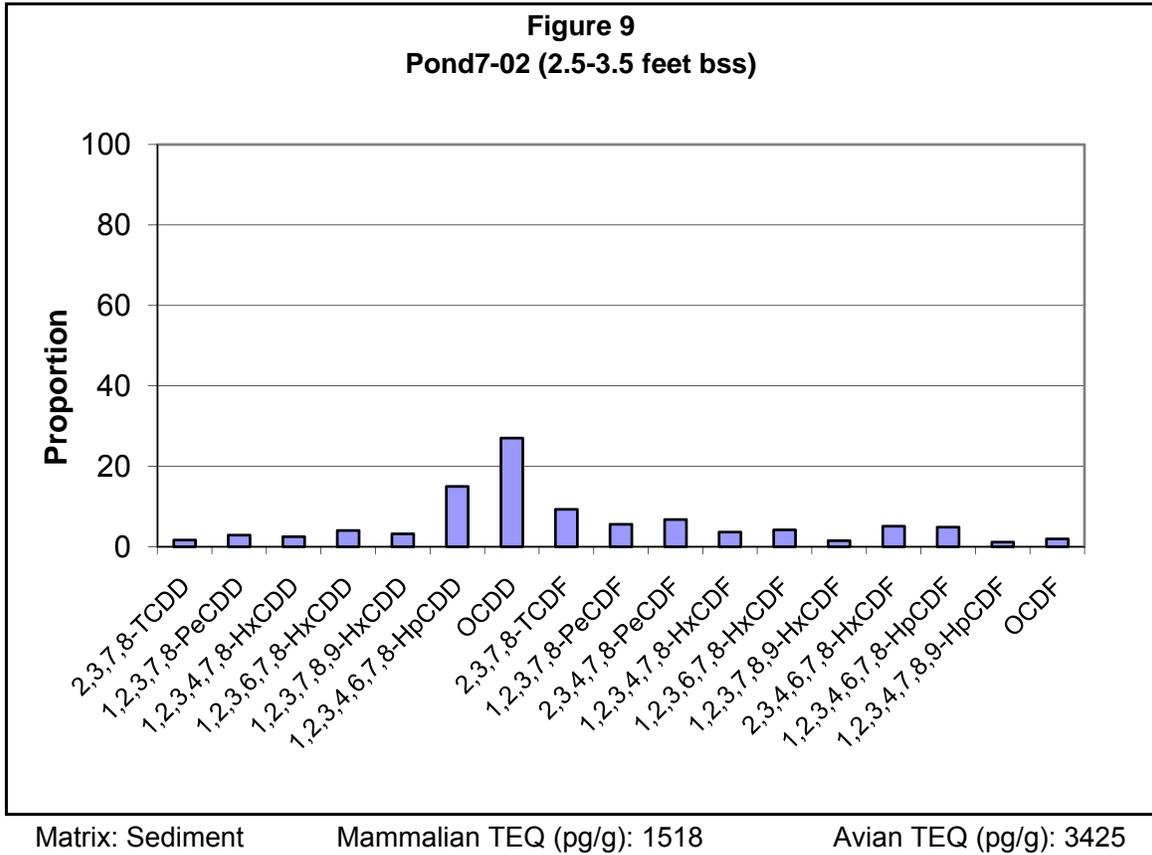
Avian TEQ (pg/g): 3537

Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

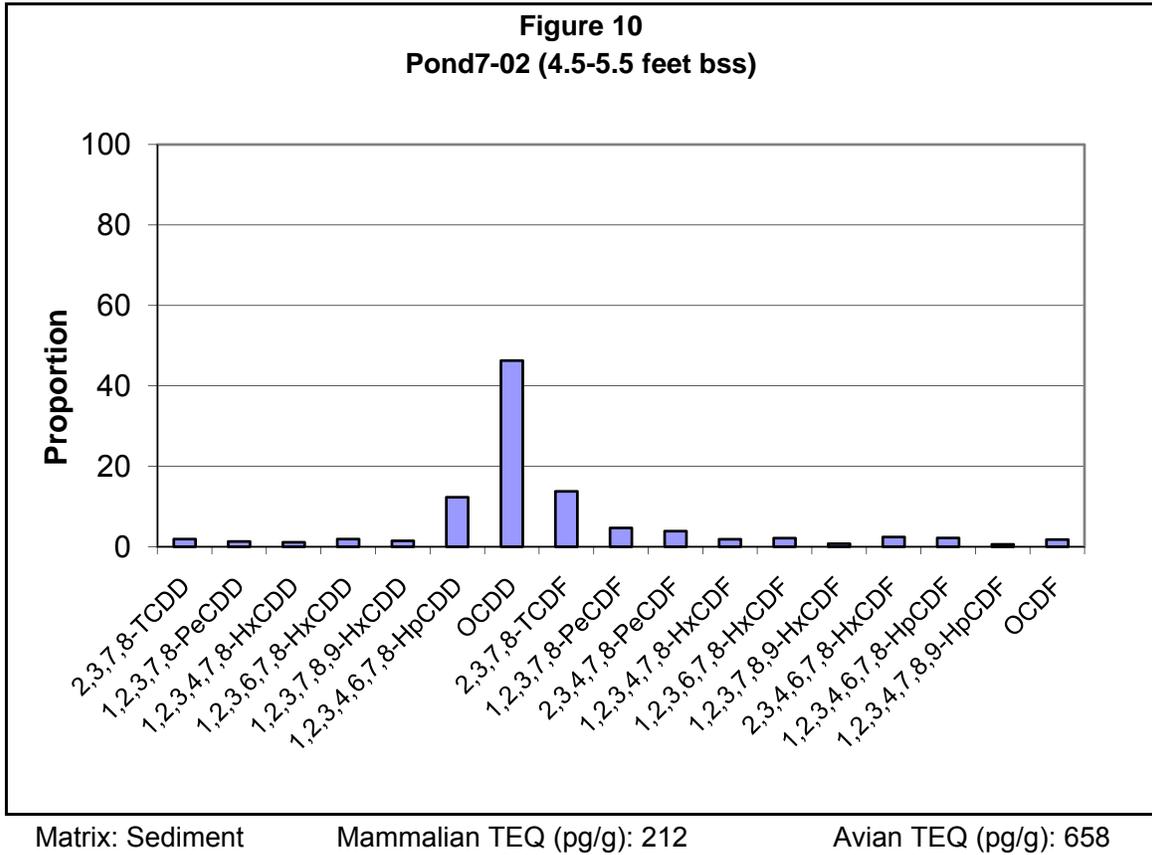


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

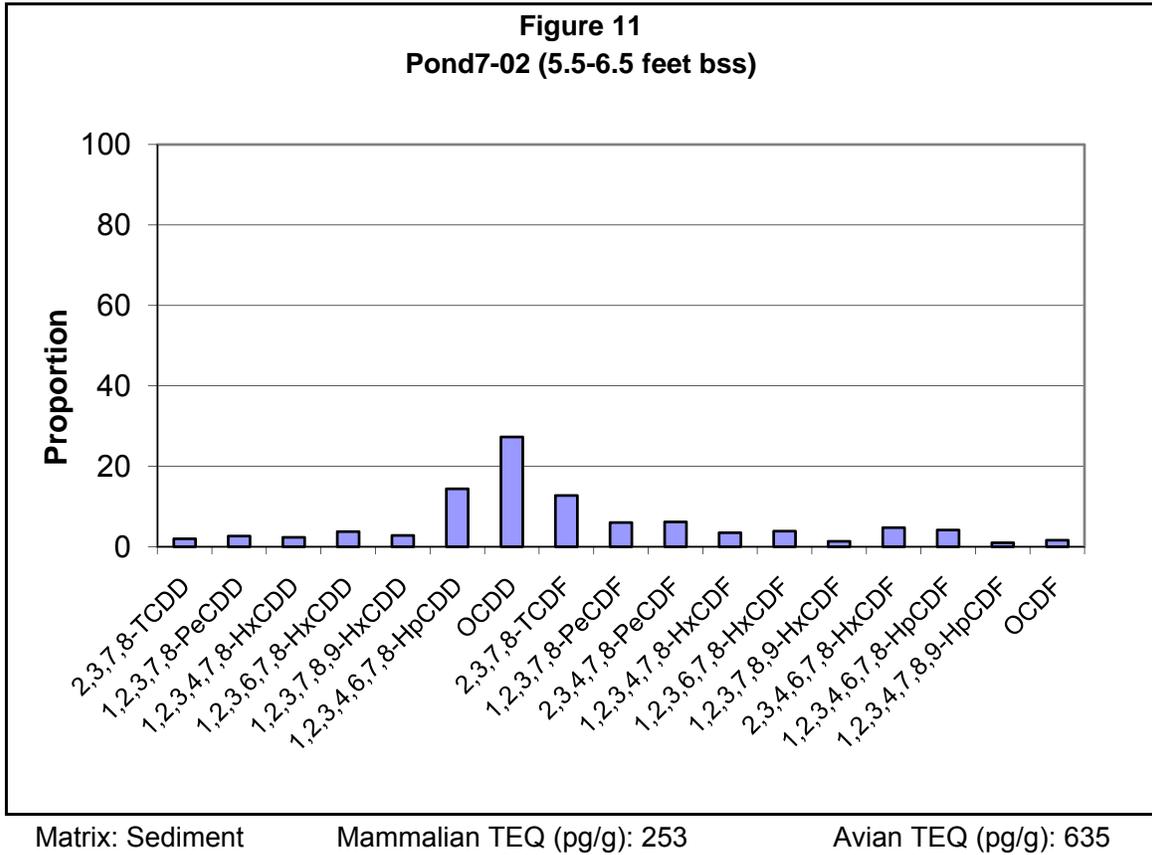


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-4
Dioxin Congener Profiles
Future Wetland Area Sediments - Pond 7**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

TEQ = toxic equivalent



Attachment G-5

Southern Ponds Sediments Dioxin
Congener Profiles

Tables

Dioxin/Furan Source
Classifications: Southern Ponds
Sediments

Attachment G-5
Table 1. Dioxin/Furan Source Classifications
Southern Ponds Sediments

Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California

Location ID	Depth (ft bss)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
Pond 1						
DP-7.9	0 to 0.5 ft	3/14/08	DP-7.9-5	#NAME?	28	muni
Pond1-01	0 to 0.5 ft	3/15/08	PD1-01SED-PD-0-0.5	136	410	muni
Pond1-01	0.5 to 1.5 ft	3/16/08	PD1-01SED-VC-0.5-1.5	272	869	muni
Pond1-01	1.5 to 2.5 ft	3/17/08	PD1-01SED-VC-1.5-2.5	85	291	muni
Pond1-02 *	0 to 0.5 ft	3/18/08	PD1-02SED-PD-0-0.5	200	588	mixture
Pond 2						
DP-7.11	2 to 2.5 ft	4/5/06	DP-7.11-10	131	408	mixture
Pond2-01	0 to 0.5 ft	3/19/08	PD2-01SED-PD-0-.5	473	1191	muni
Pond2-01	0.5 to 1.5 ft	3/13/08	PD2-01SED-VC-0.5-1.5	279	873	muni
Pond2-02	0 to 0.5 ft	3/19/08	PD2-02SED-PD-0-0.5	996	2239	muni
Pond2-02	0.5 to 1.5 ft	3/13/08	PD2-02SED-VC-0.5-1.5	287	819	muni
Pond2-02	1.5 to 2.5 ft	3/13/08	PD2-02SED-VC-1.5-2.5	107	366	mixture
Pond2-02	2.5 to 3.5 ft	3/13/08	PD2-02SED-VC-2.5-3.5	103	338	muni
Pond2-02	4.5 to 5.5 ft	3/13/08	PD2-02SED-VC-4.5-5.5	59	208	muni
Pond 3						
DP-7.13	0 to 0.5 ft	4/6/06	DP-7.13-8	205	625	muni
DP-7.14	6 to 6.5 ft	4/6/06	DP-7.14-7	75	209	mixture
DP-7.15	0 to 0.5 ft	4/6/06	DP-7.15-8	145	343	mixture
Pond3-01	0.5 to 1.5 ft	3/13/08	PD3-01SED-VC-0.5-1.5	1285	2793	muni
Pond3-01	1.5 to 2.5 ft	3/13/08	PD3-01SED-VC-1.5-2.5	126	411	muni
Pond3-01	2.5 to 3.5 ft	3/13/08	PD3-01SED-VC-2.5-3.5	69	216	muni
Pond3-01	3.5 to 4.5 ft	3/13/08	PD3-01SED-VC-3.5-4.5	16	35	mixture
Pond3-02	0.5 to 1.5 ft	3/14/08	PD3-02SED-VC-0.5-1.5	149	405	mixture
Pond3-02 *	1.5 to 2.5 ft	3/14/08	PD3-02SED-VC-1.5-2.5	11	21	mixture
Pond3-03	0.5 to 1.5 ft	3/14/08	PD3-03SED-VC-0.5-1.5	98	366	muni
Pond3-04	0 to 0.5 ft	3/19/08	PD3-04SED-SH-0-0.5	451	1137	muni
Pond3-05	0.5 to 1.5 ft	3/14/08	PD3-05SED-VC-0.5-1.5	53	175	mixture
Pond3-05	1.5 to 2.5 ft	3/14/08	PD3-05SED-VC-1.5-2.5	34	86	mixture
Pond3-06	0 to 0.5 ft	3/19/08	PD3-06SED-SH-0-0.5	175	501	mixture
Pond3-07	0 to 0.5 ft	3/19/08	PD3-07SED-SH-0-0.5	99	377	muni
Pond3-08	0 to 0.5 ft	3/19/08	PD3-08SED-SH-0-0.5	191	520	mixture
Pond3-09	0 to 0.5 ft	3/19/08	PD3-09SED-SH-0-0.5	117	177	ambient
Pond 4						
Pond4-01	0 to 0.5 ft	3/18/08	PD4-01SED-PD-0-0.5	50	120	mixture

Notes:

ambient = congener profile consistent with ambient dioxin/furans.

mixture = congener profile consistent with multiple sources of dioxin/furans.

muni = congener profile consistent with dioxin/furans from (municipal) waste wood incineration.

* This sample is not consistent with a single source of dioxins/furans. It was previously classified as ambient (Pond1-02) or waste wood ash (Pond3-02) in the OU-E Pond Sediment Report.

Acronyms and Abbreviations:

bss = below sediment surface

ft = feet

pg/g = picogram per gram

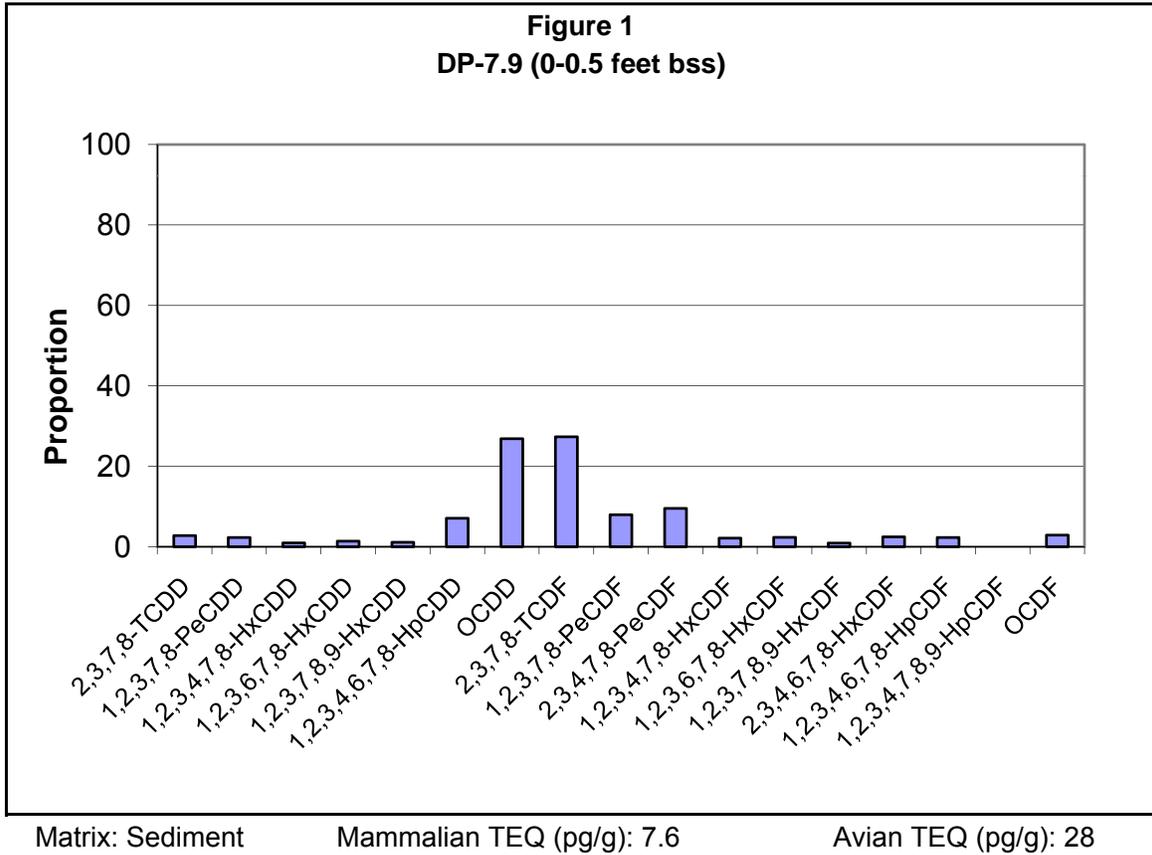
TEQ = toxic equivalent

Figures – Pond 1

Dioxin Congener Profiles:
Southern Ponds Sediments –
Pond 1

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

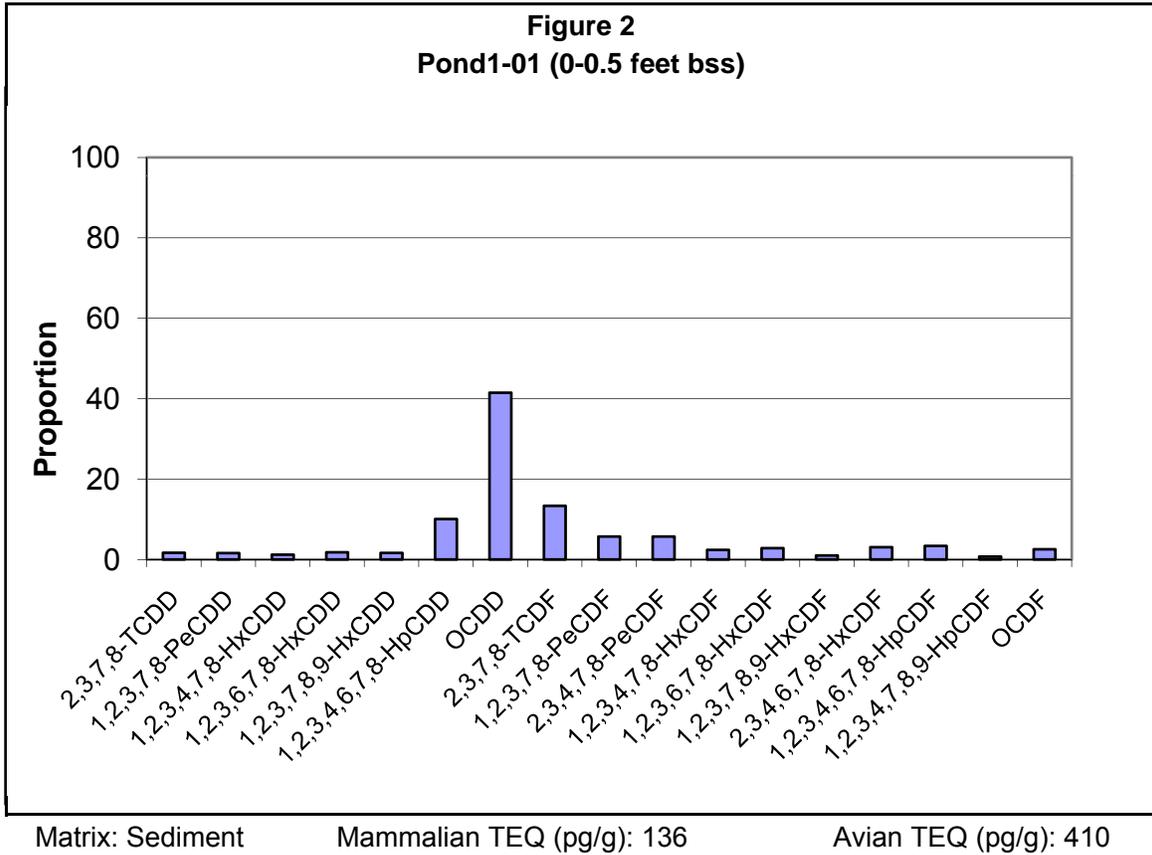


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
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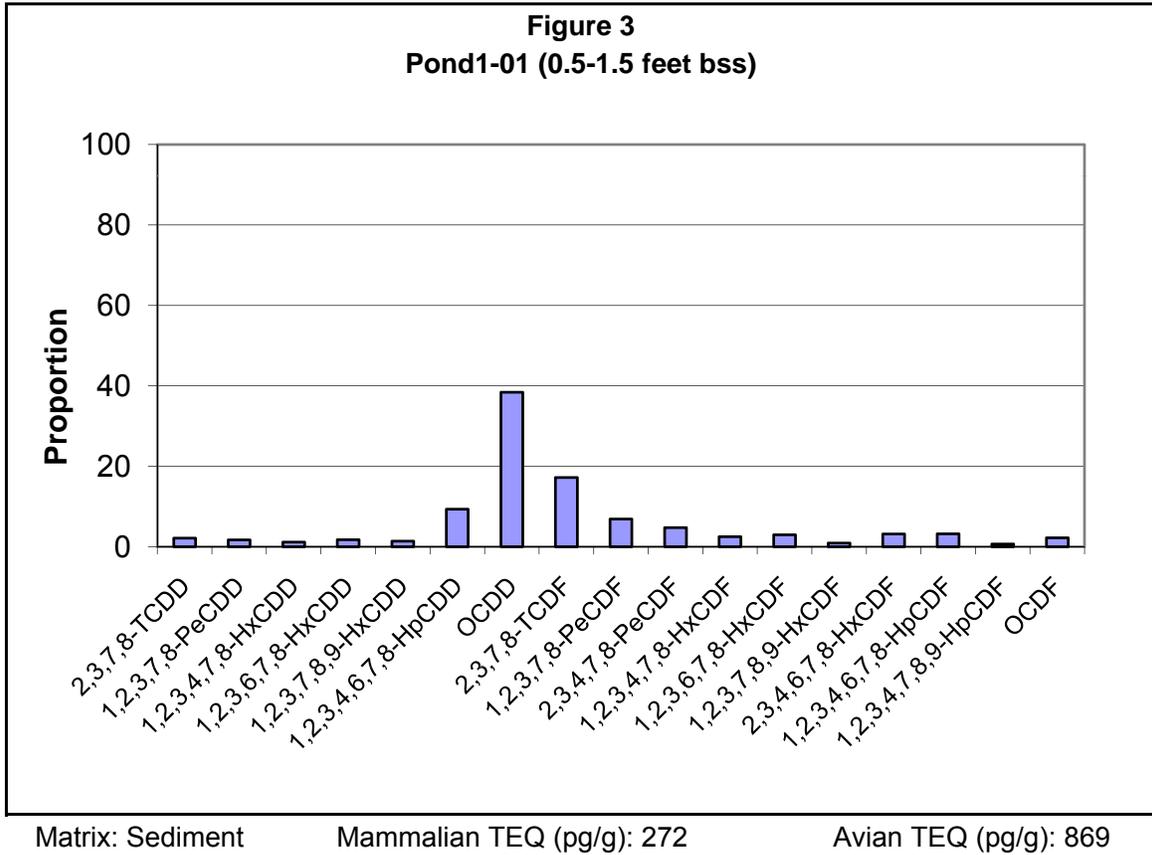


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

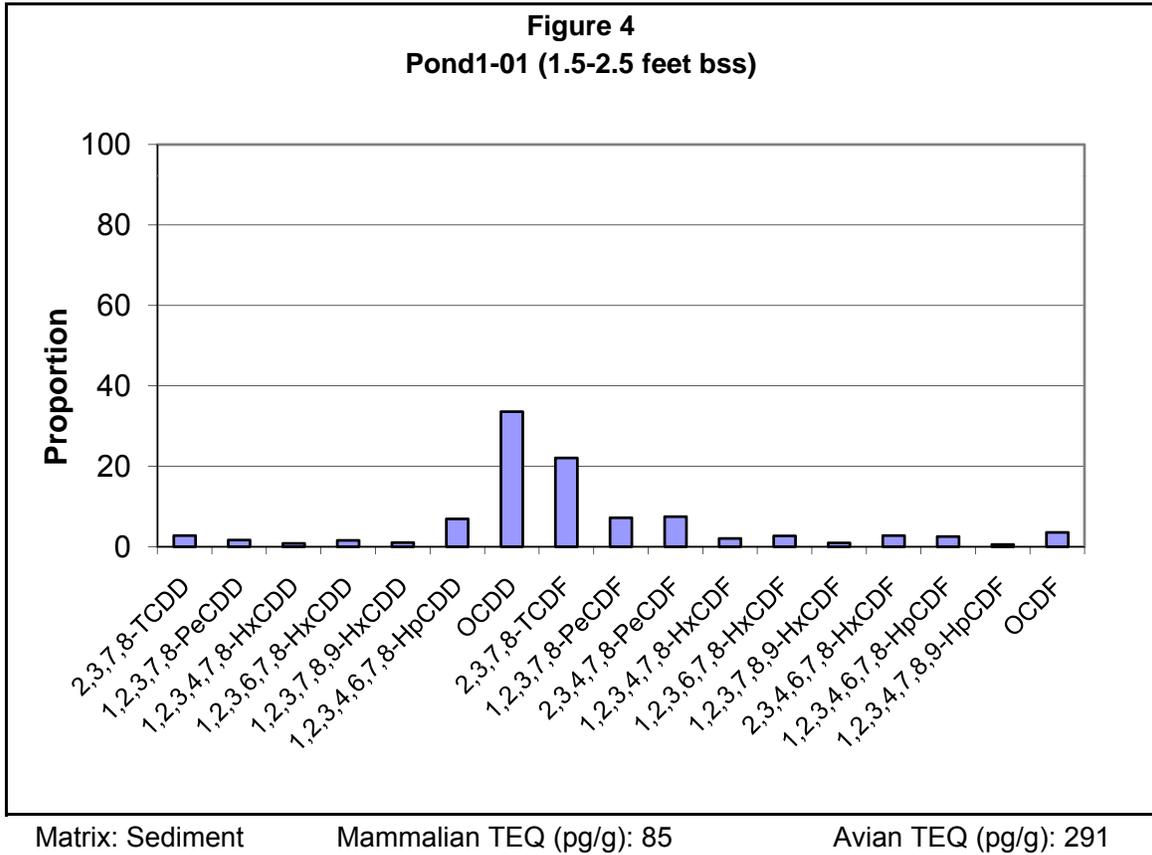


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

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Fort Bragg, California**

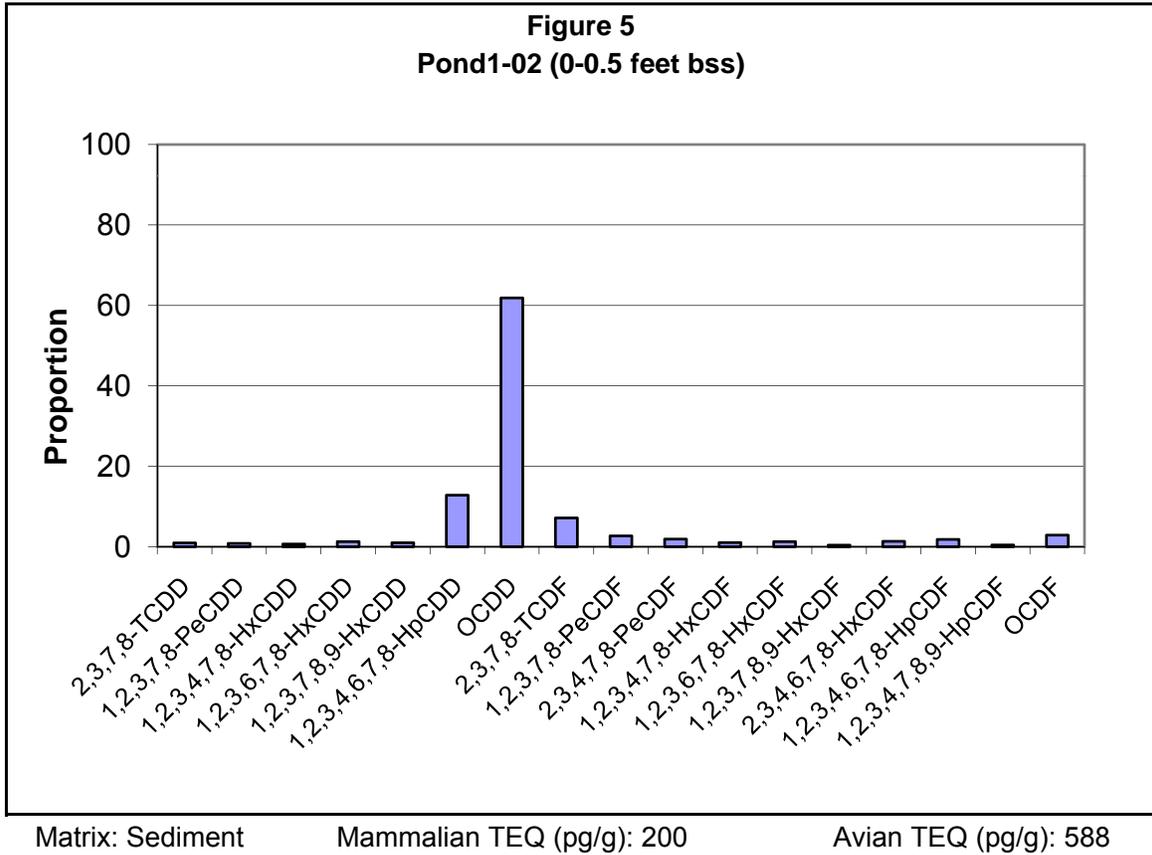


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 1**

**Remedial Investigation Report Operable Unit E
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Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

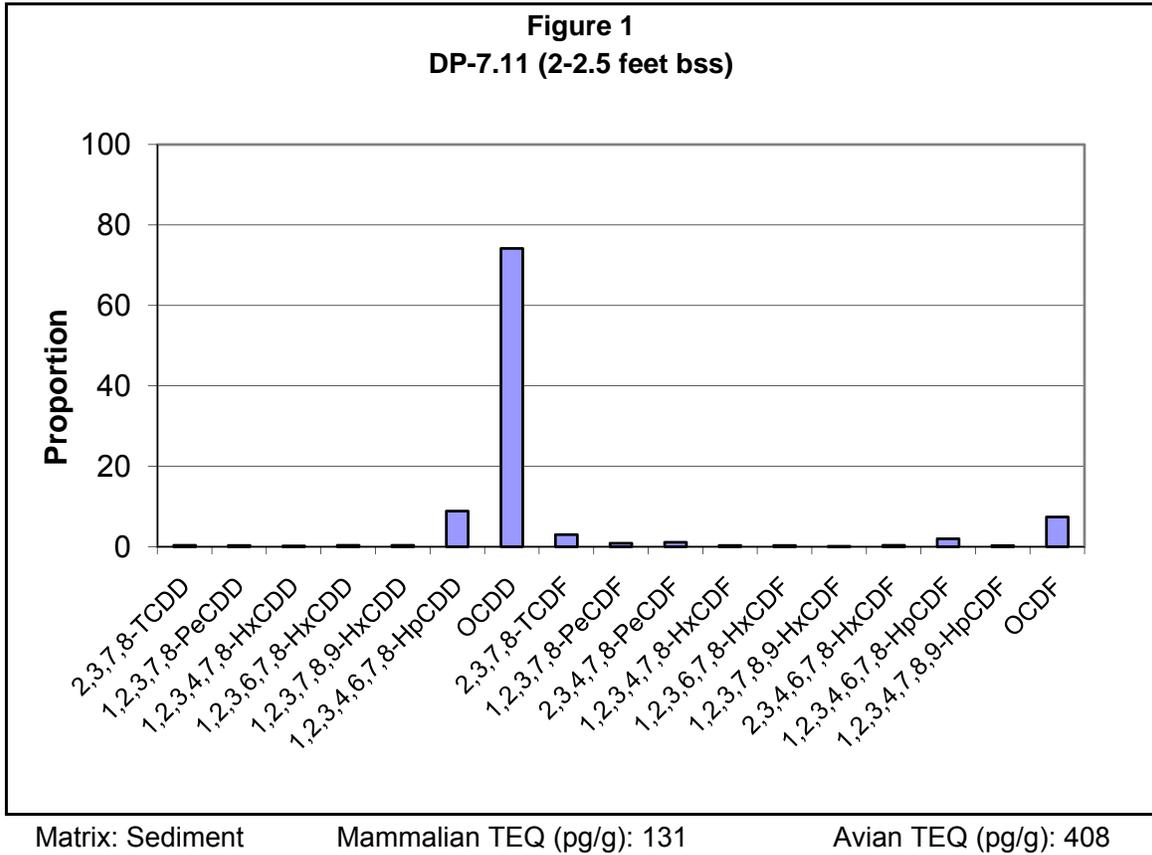
TEQ = toxic equivalent

Figures – Pond 2

Dioxin Congener Profiles:
Southern Ponds Sediments –
Pond 2

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

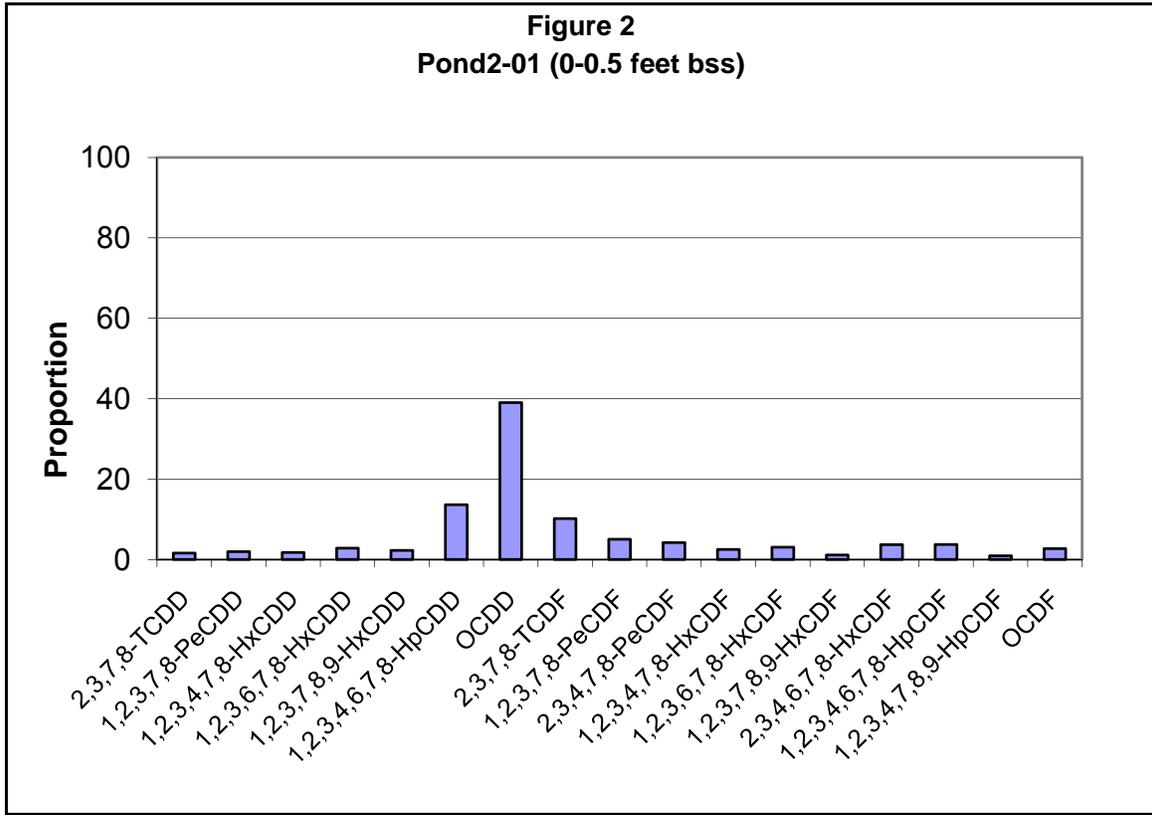


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Matrix: Sediment

Mammalian TEQ (pg/g): 473

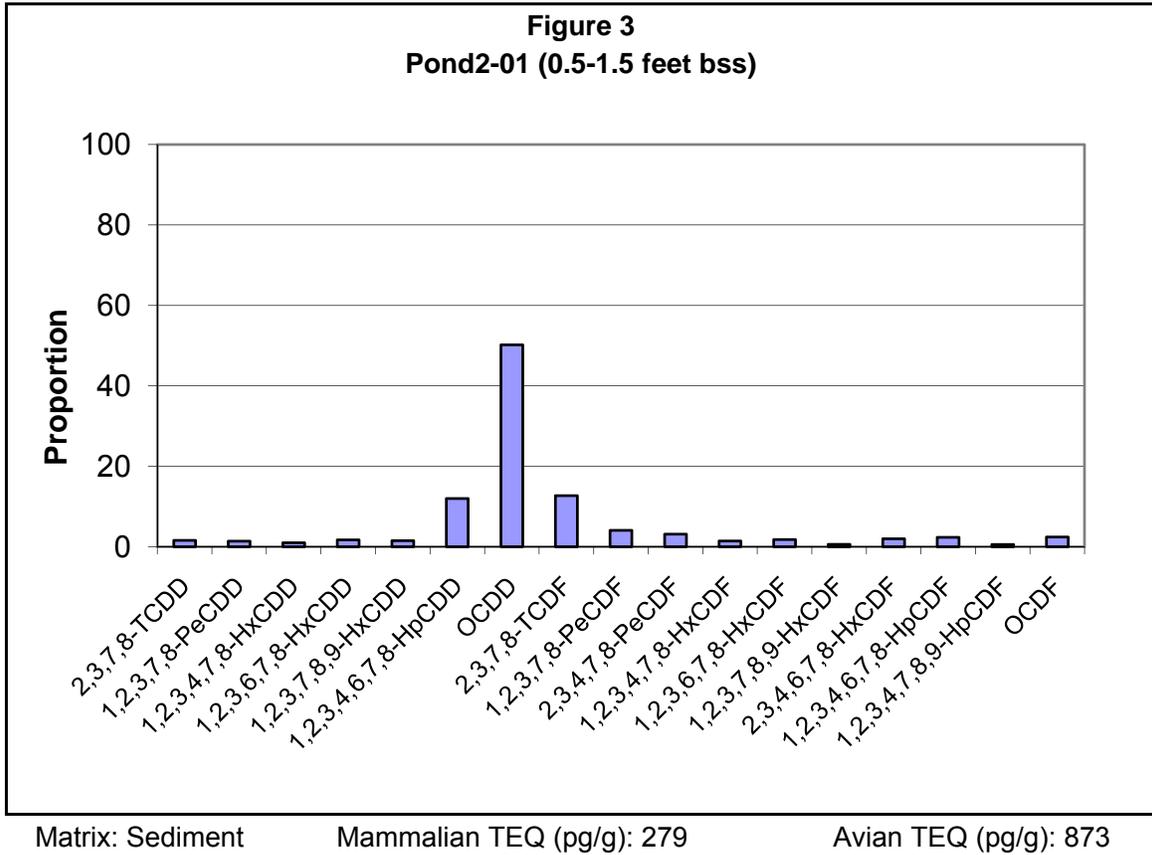
Avian TEQ (pg/g): 1191

Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

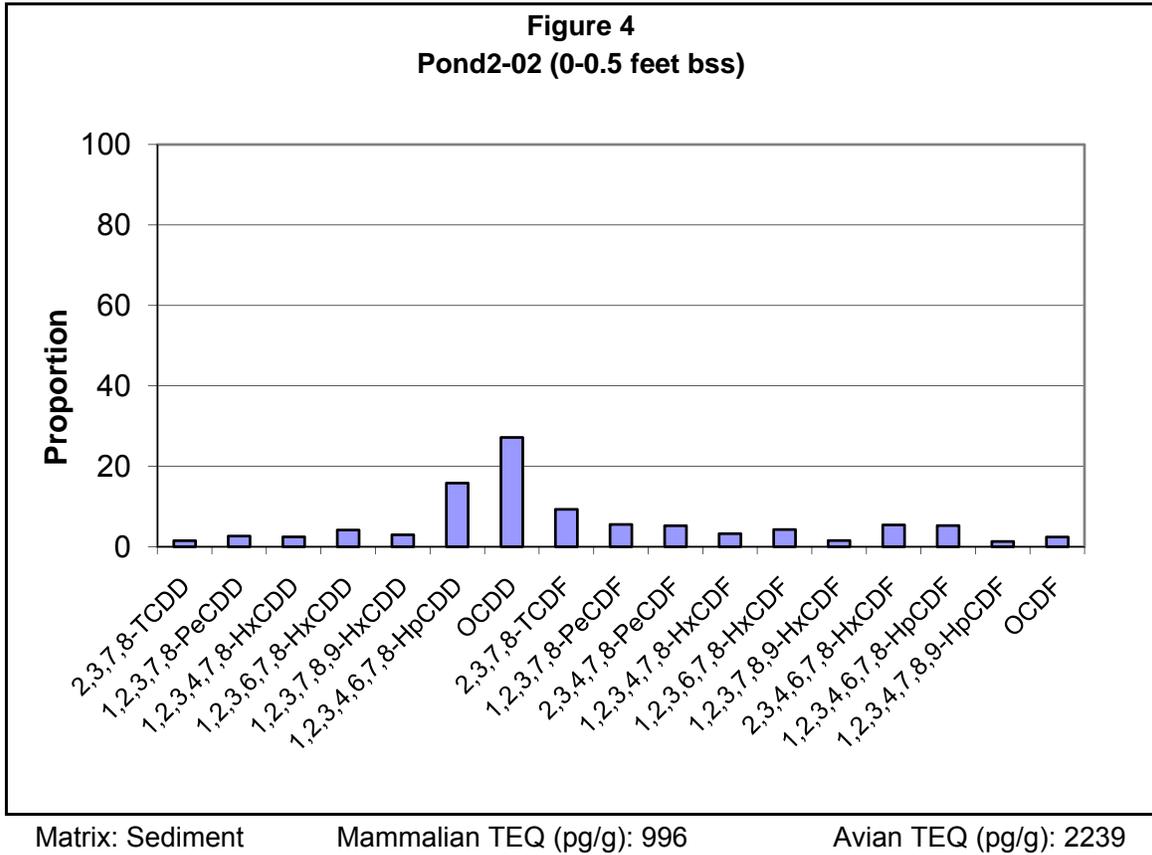


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

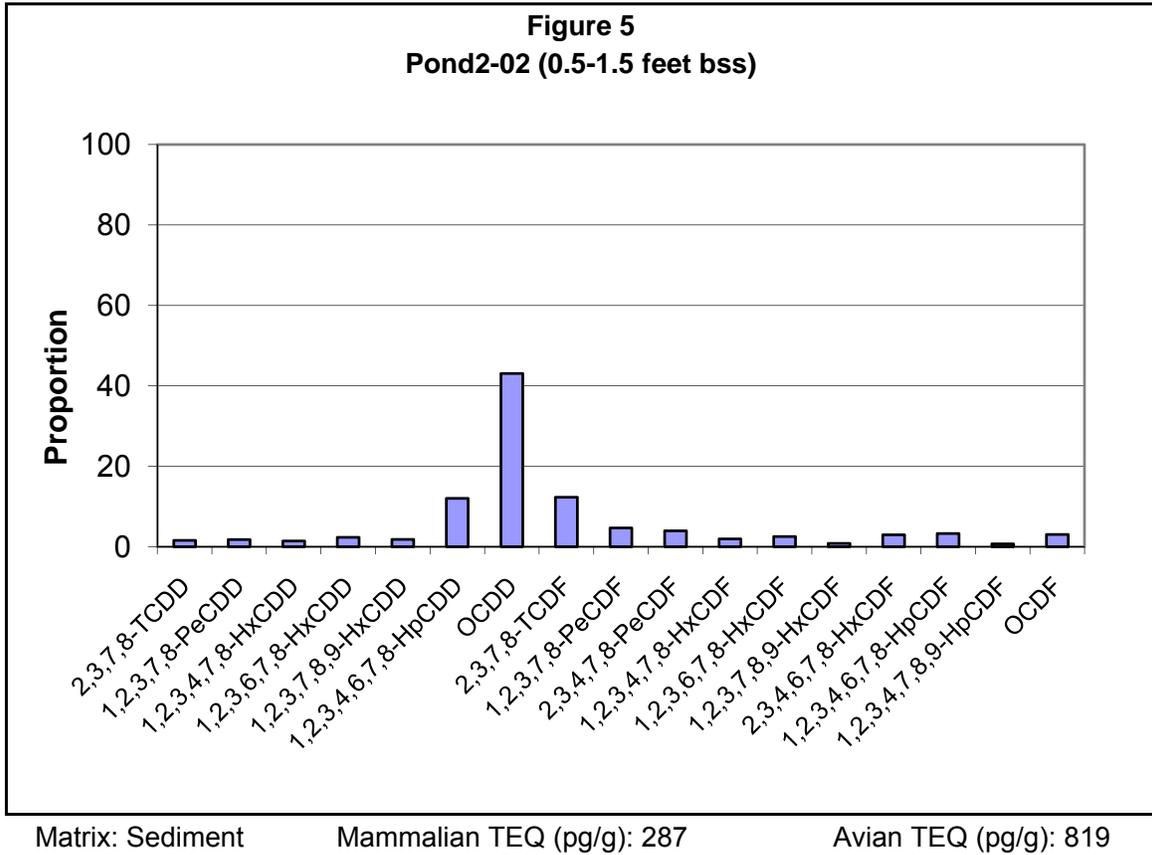


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

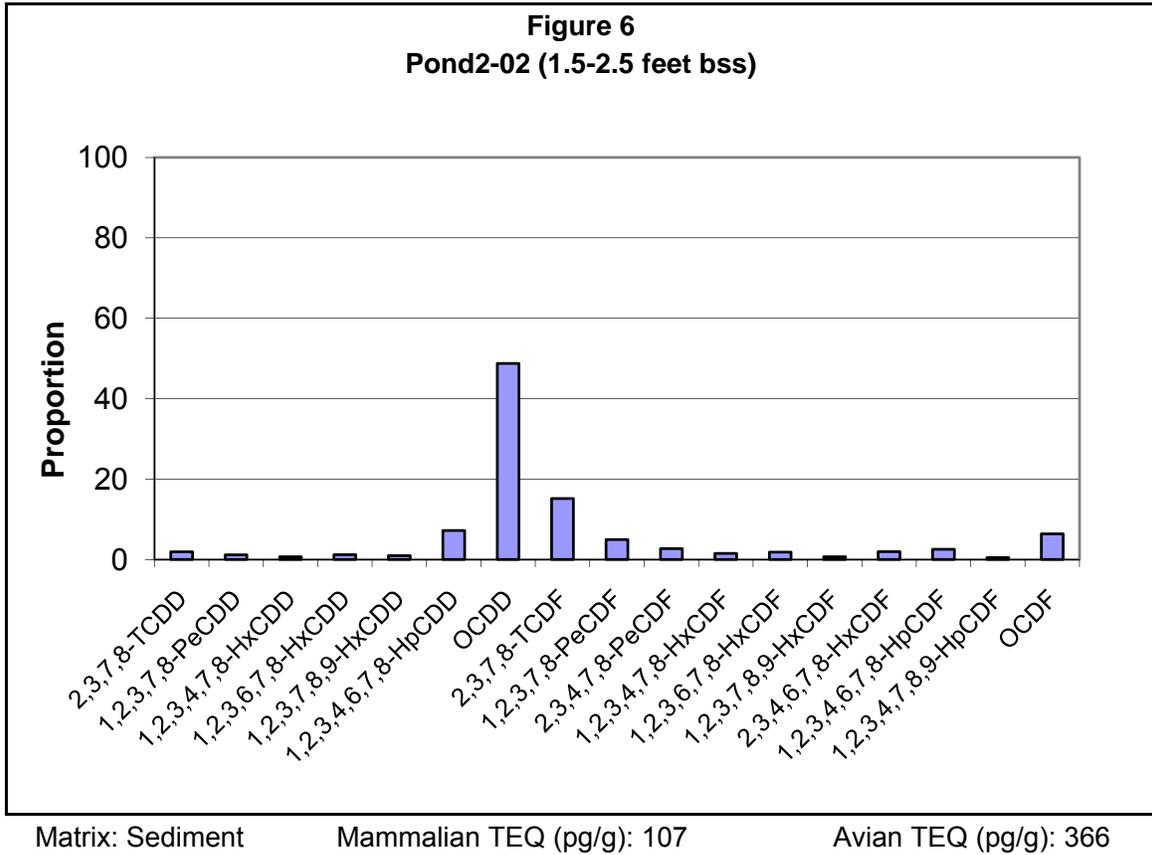


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

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Fort Bragg, California**

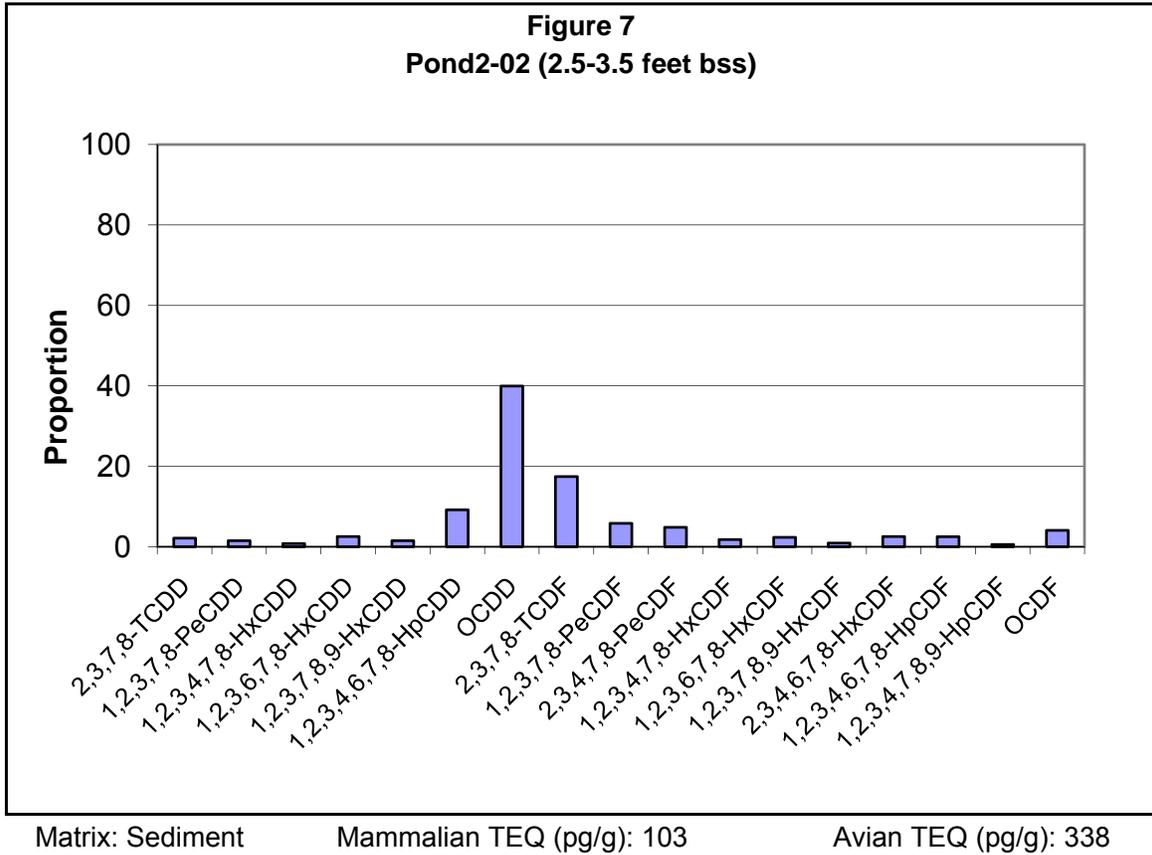


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
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Fort Bragg, California**

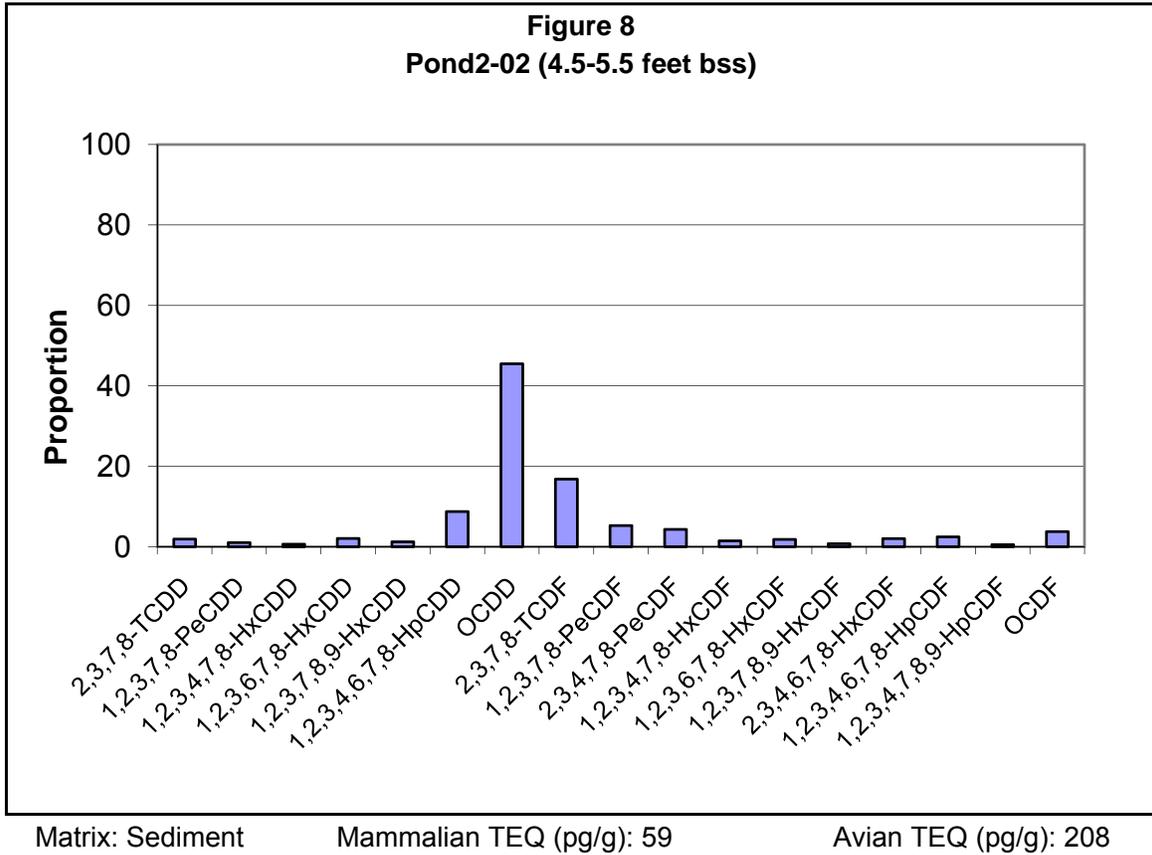


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 2**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

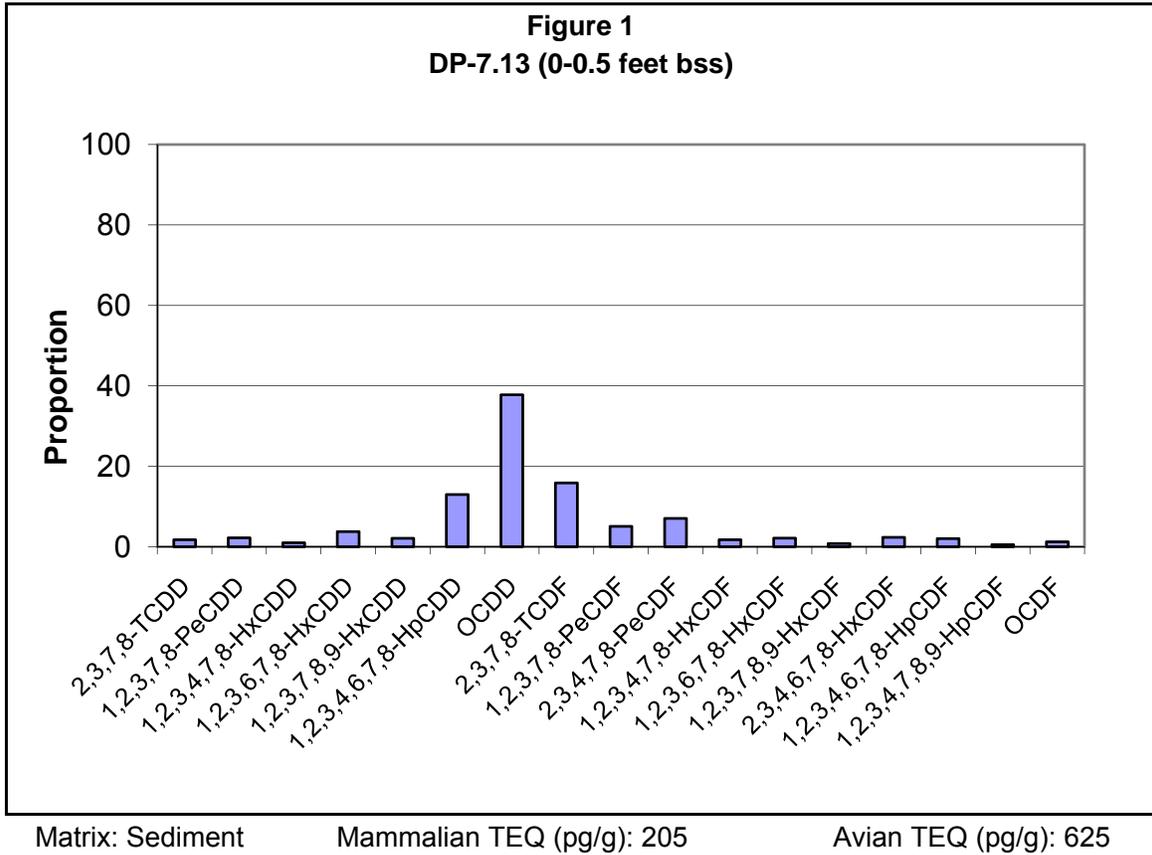
TEQ = toxic equivalent

Figures – Pond 3

Dioxin Congener Profiles:
Southern Ponds Sediments –
Pond 3

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

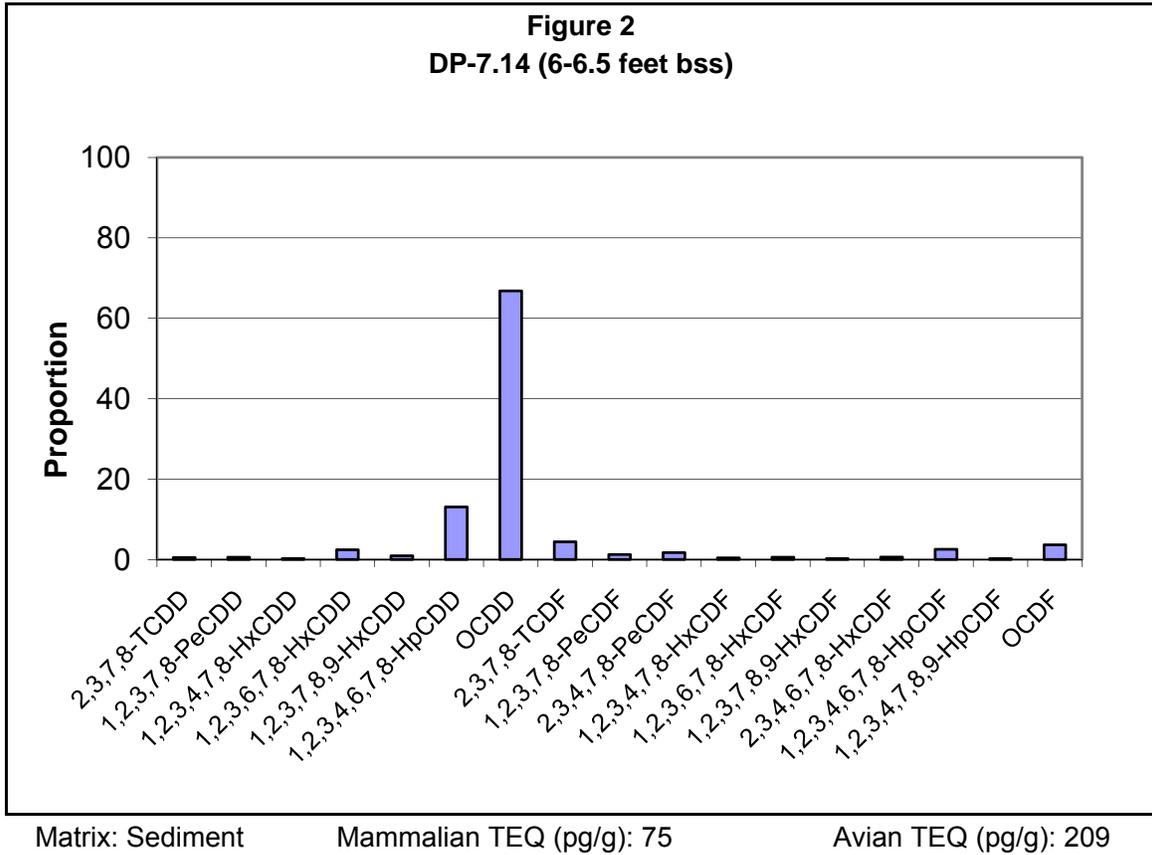


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

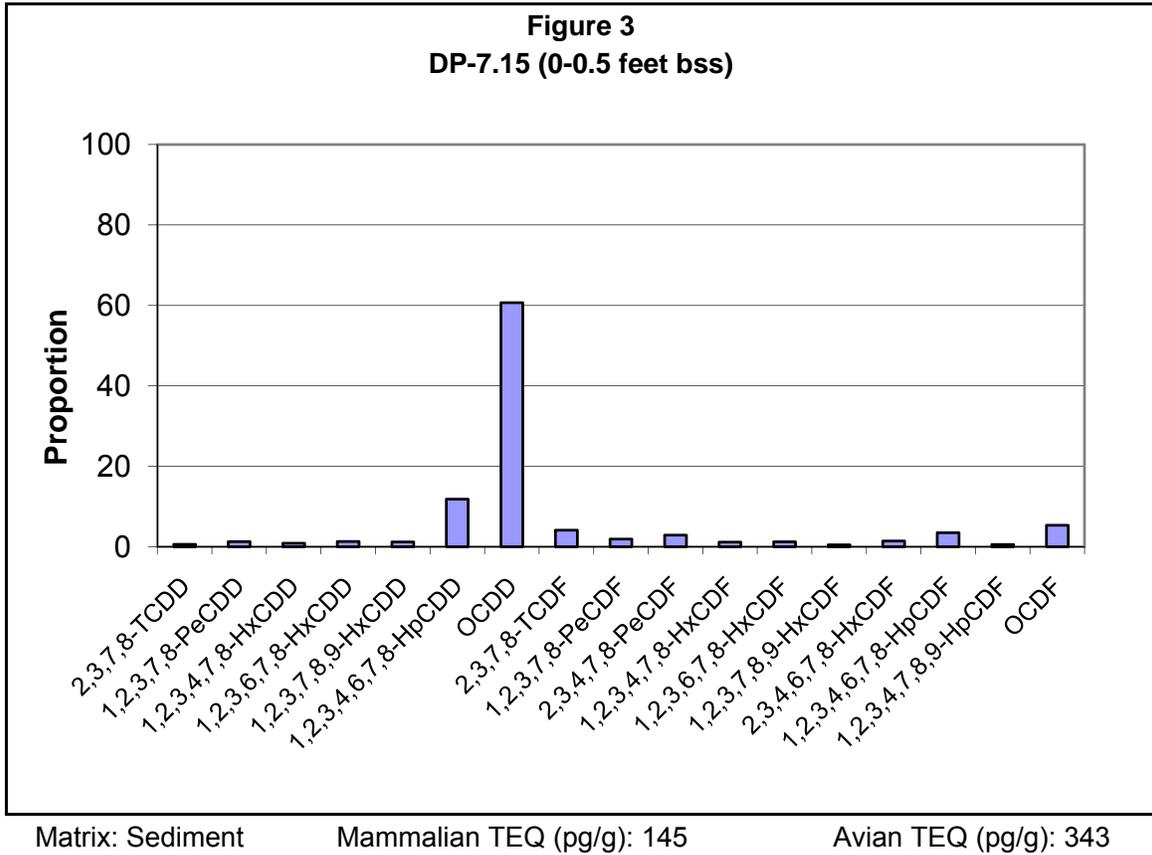


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

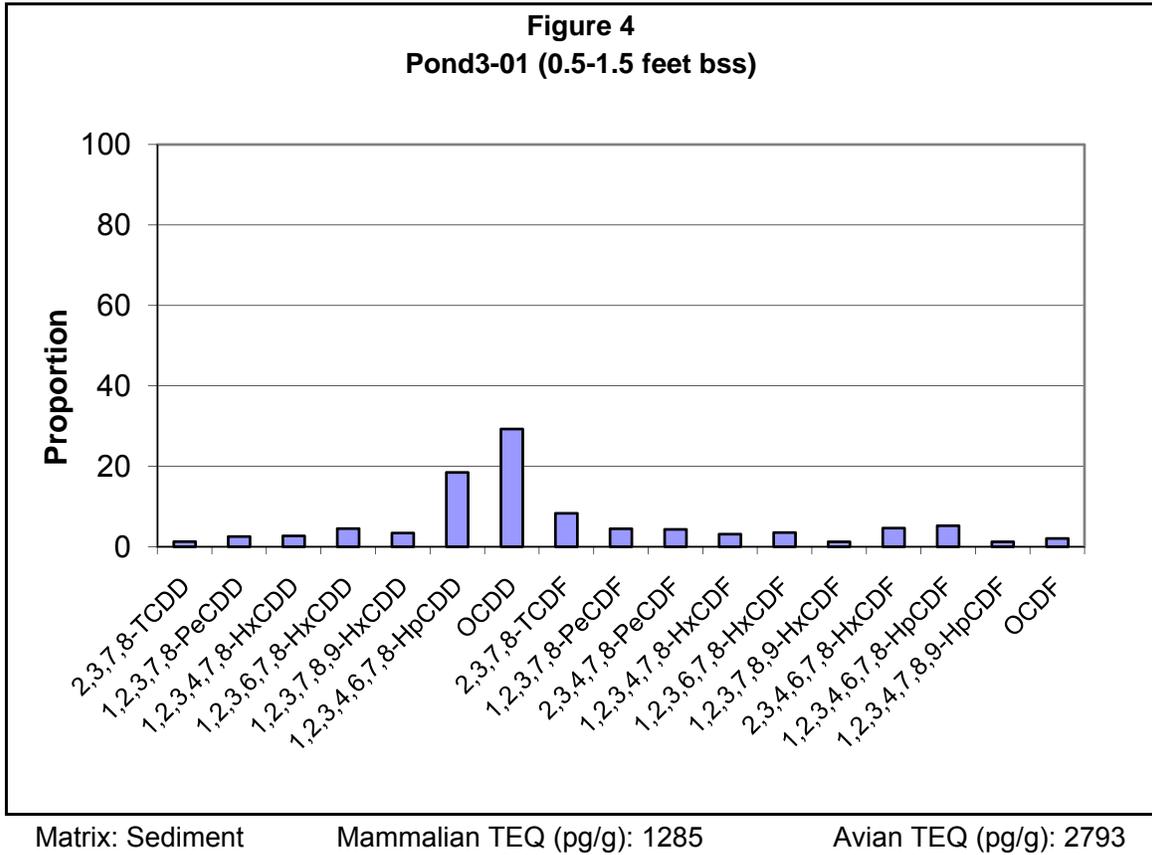


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

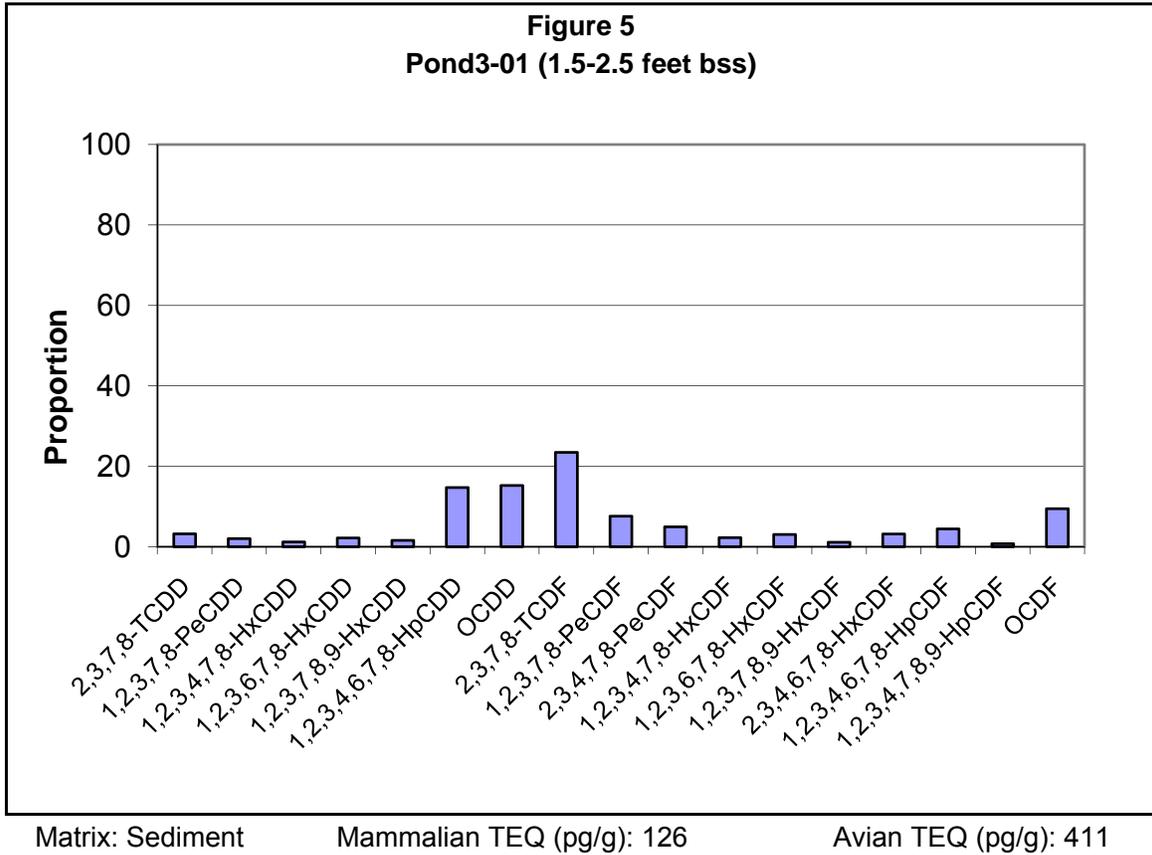


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

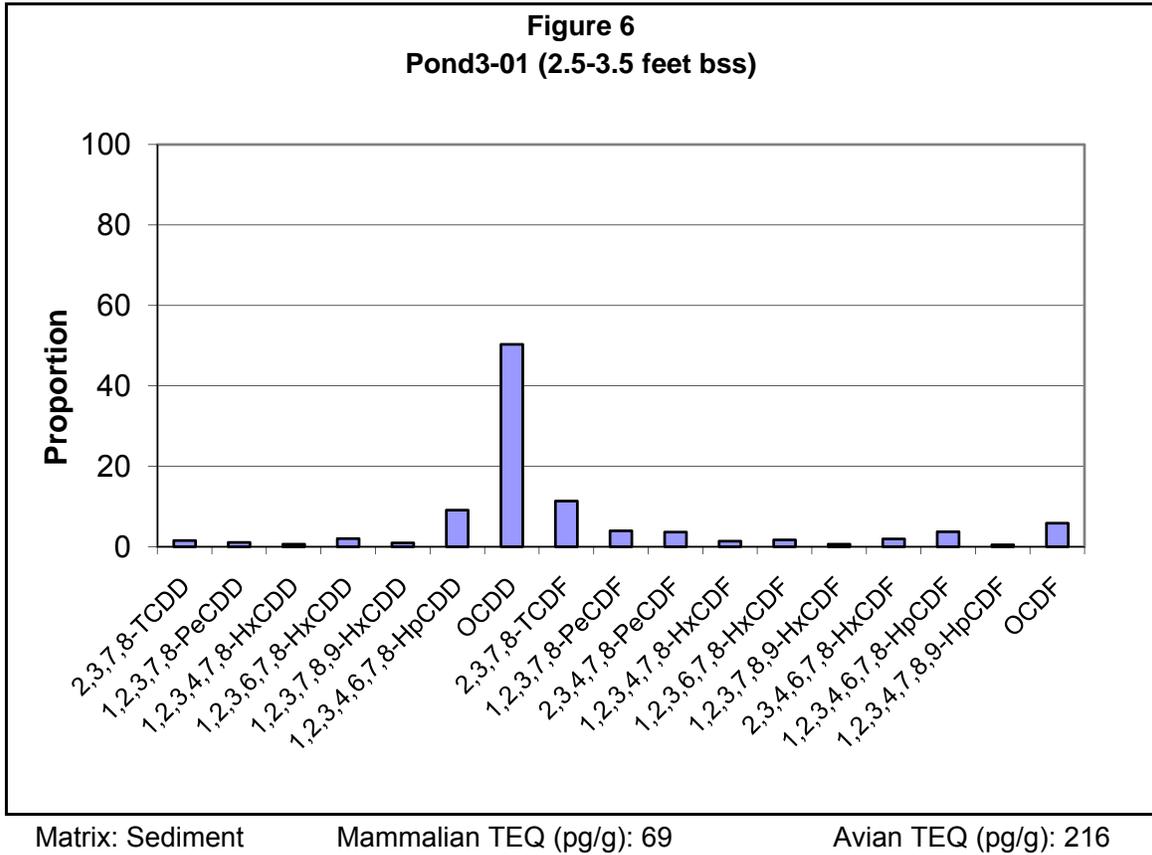


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

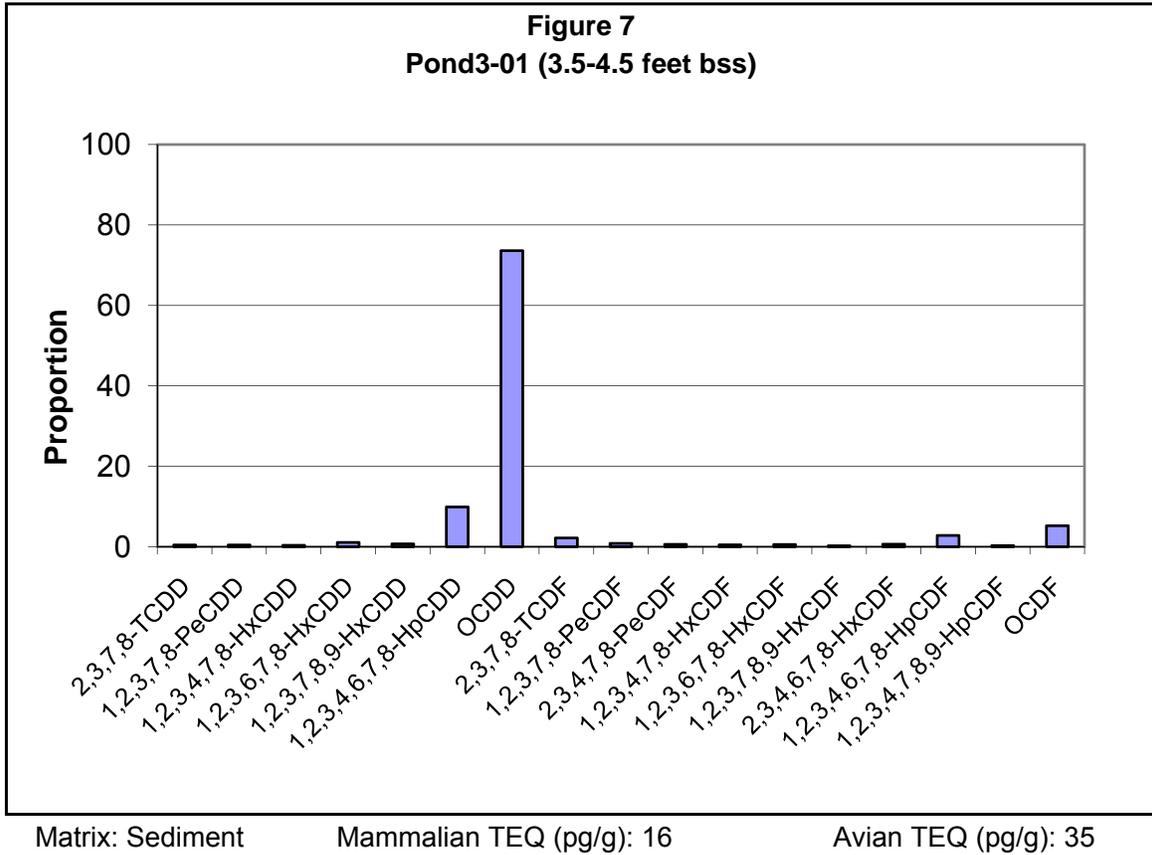


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
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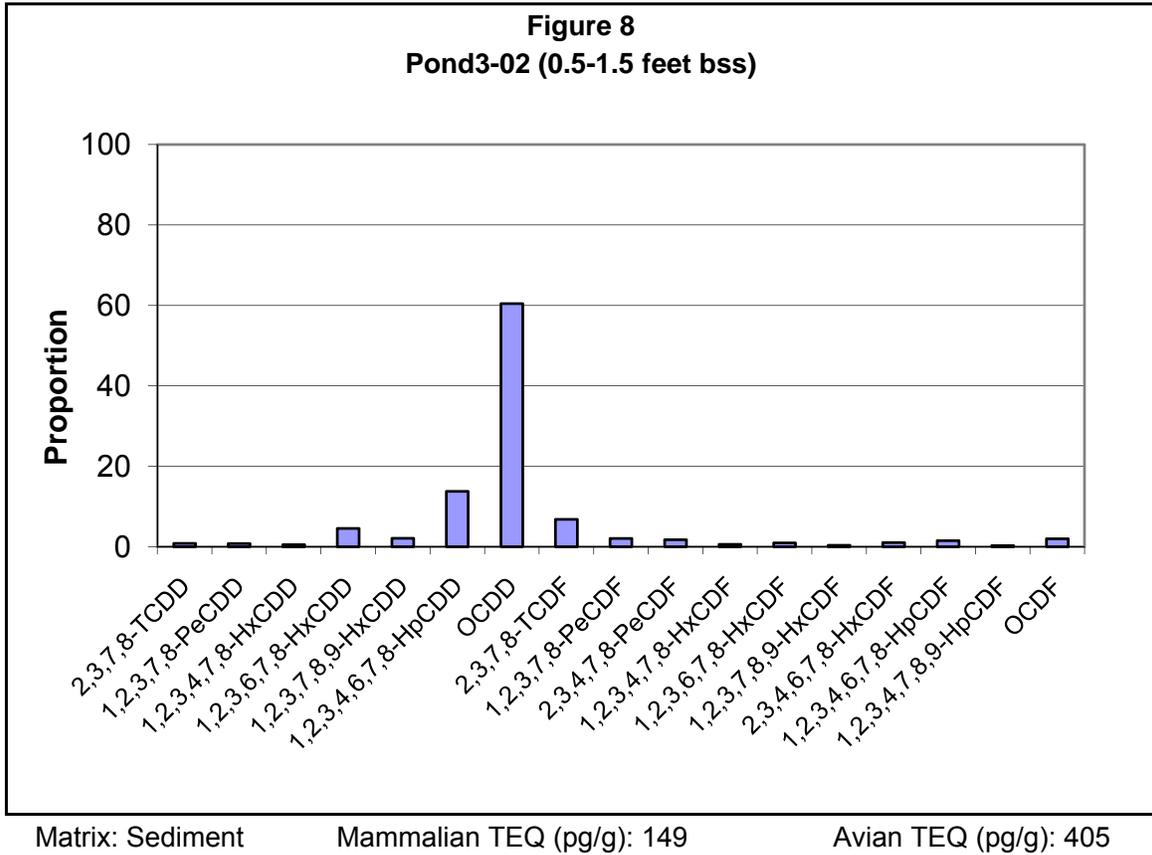


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

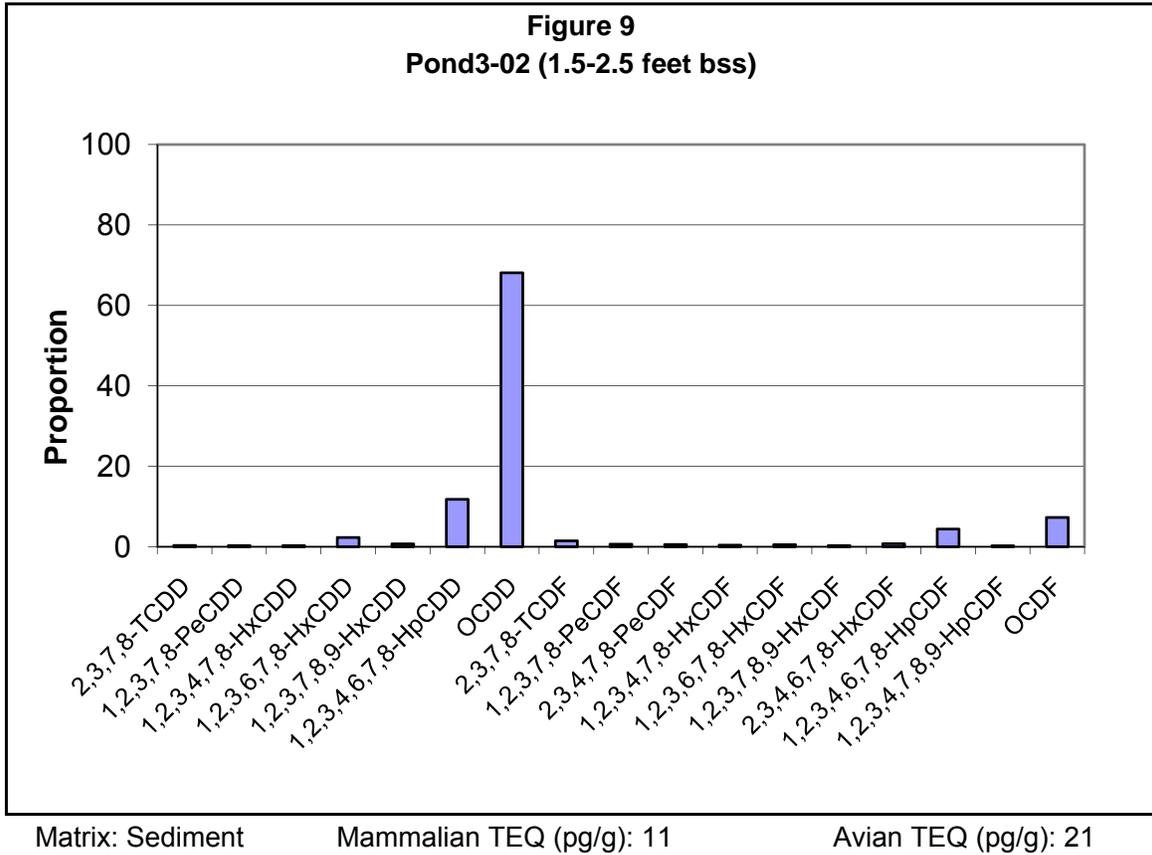


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

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Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
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Fort Bragg, California**

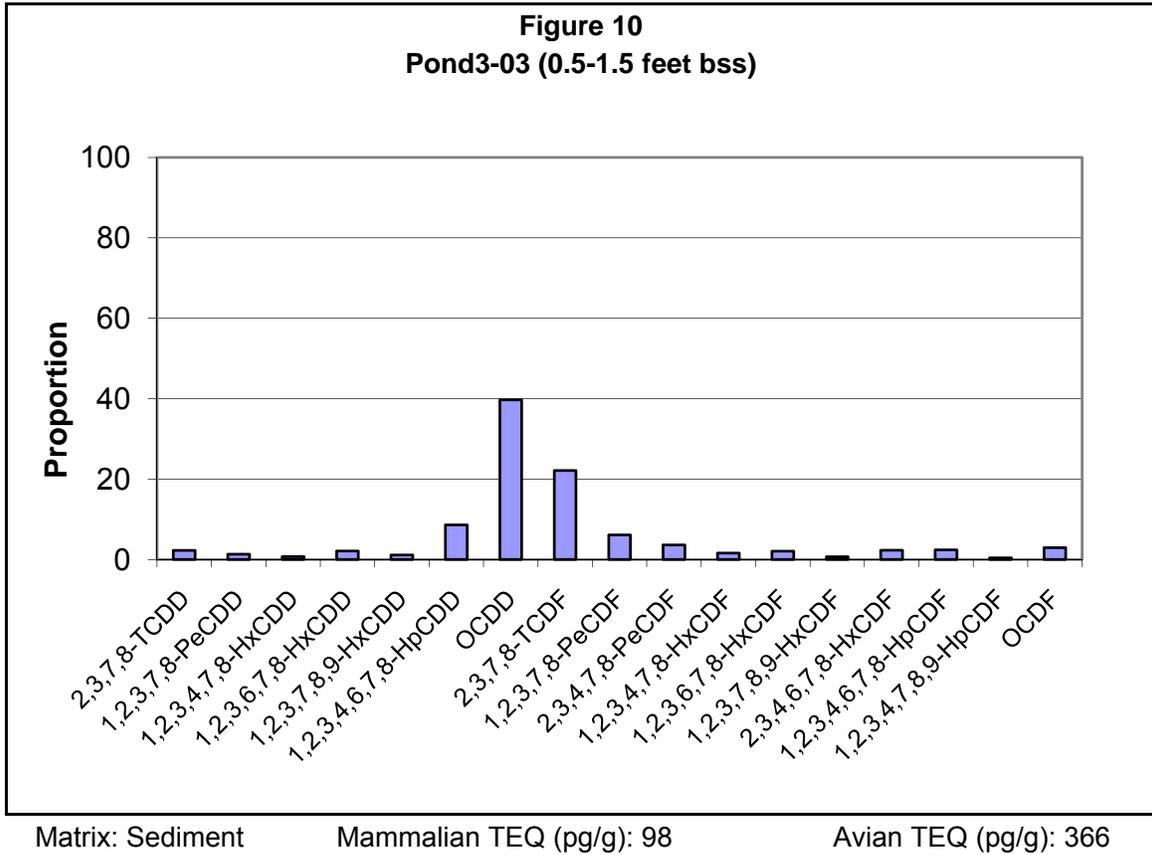


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

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Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
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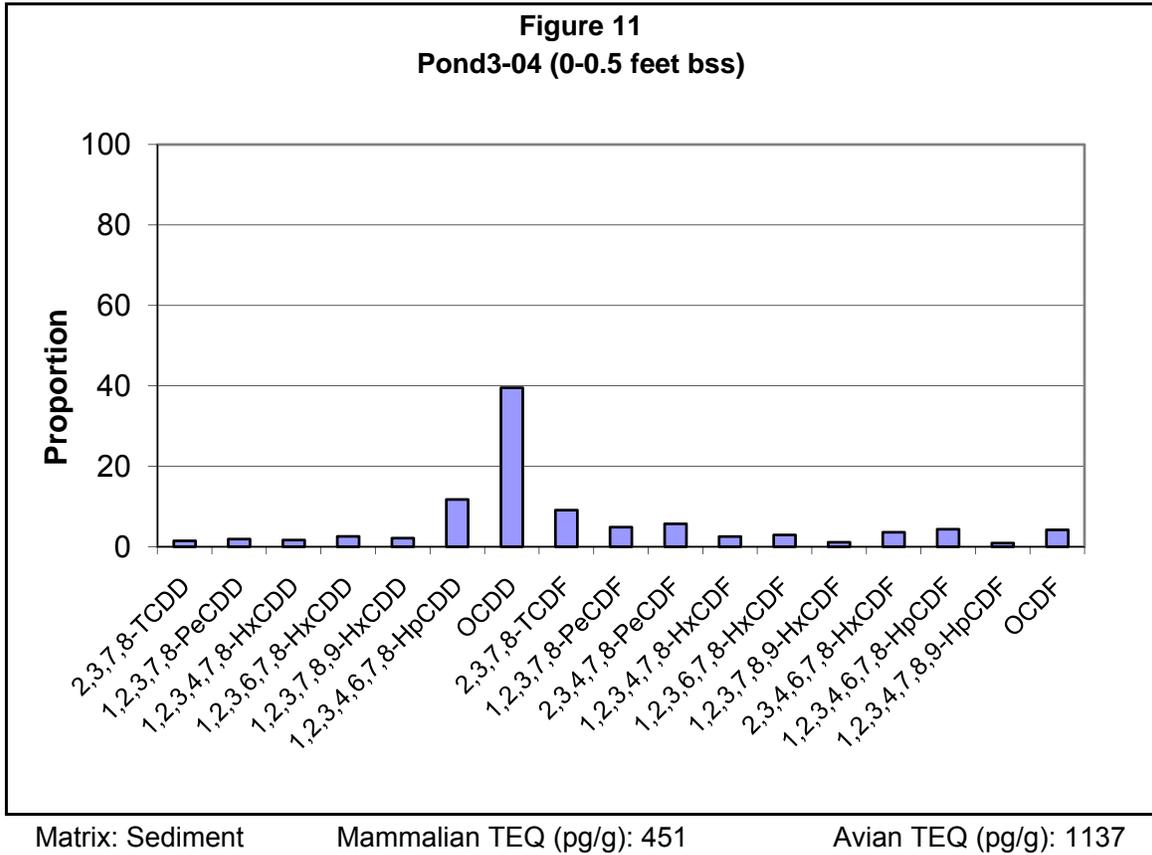


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

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Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

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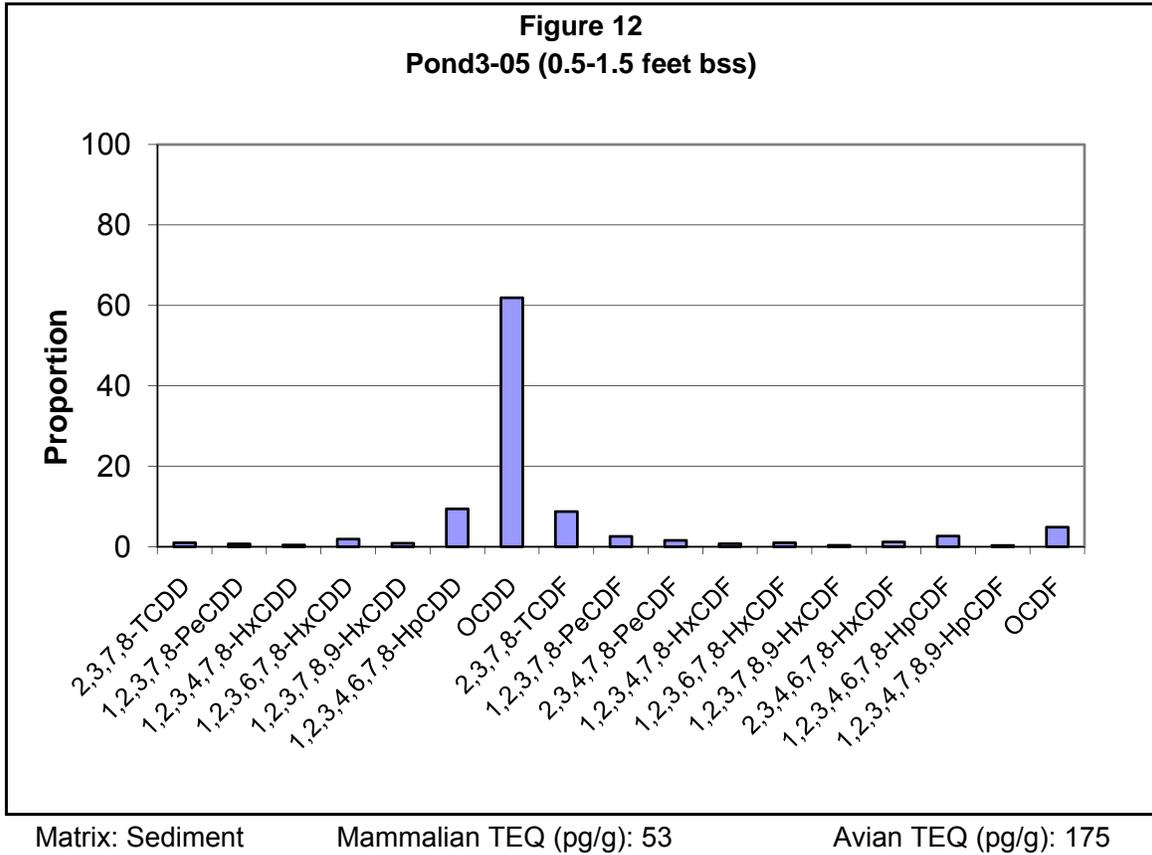


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

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Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

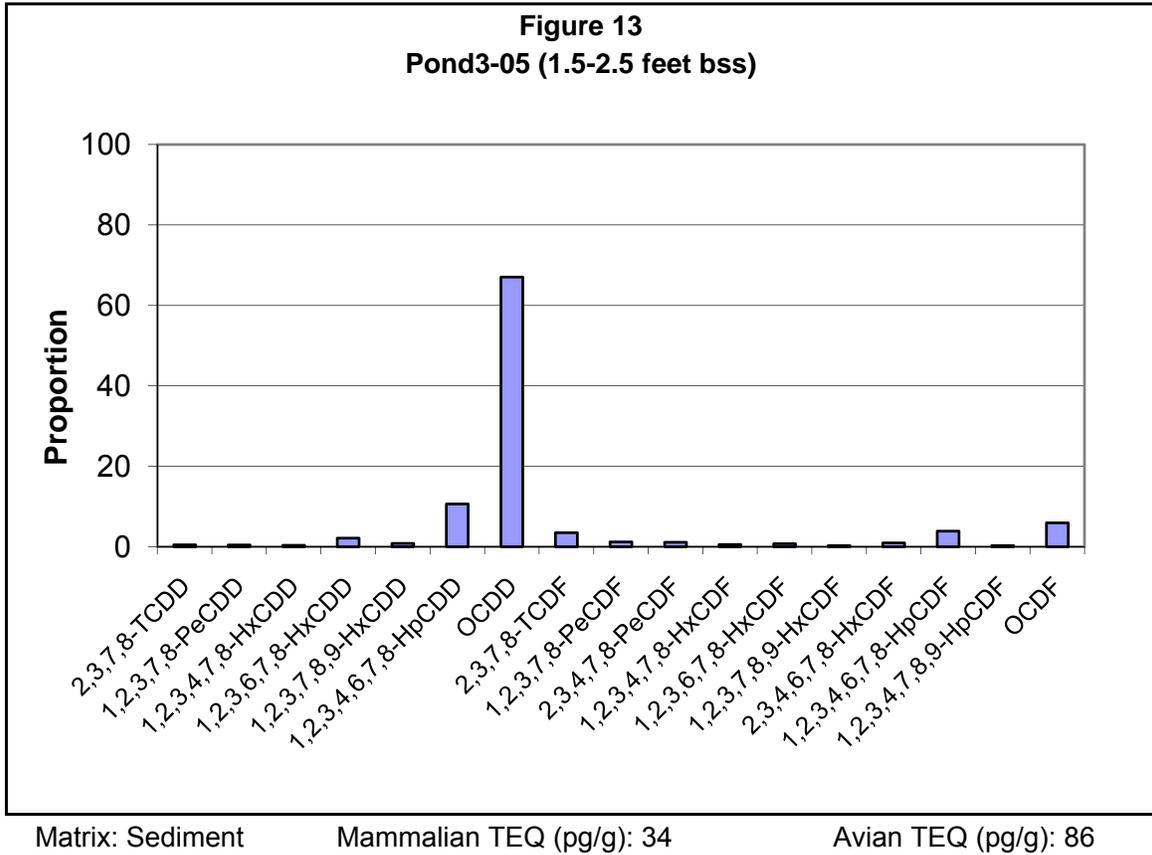


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
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Fort Bragg, California**

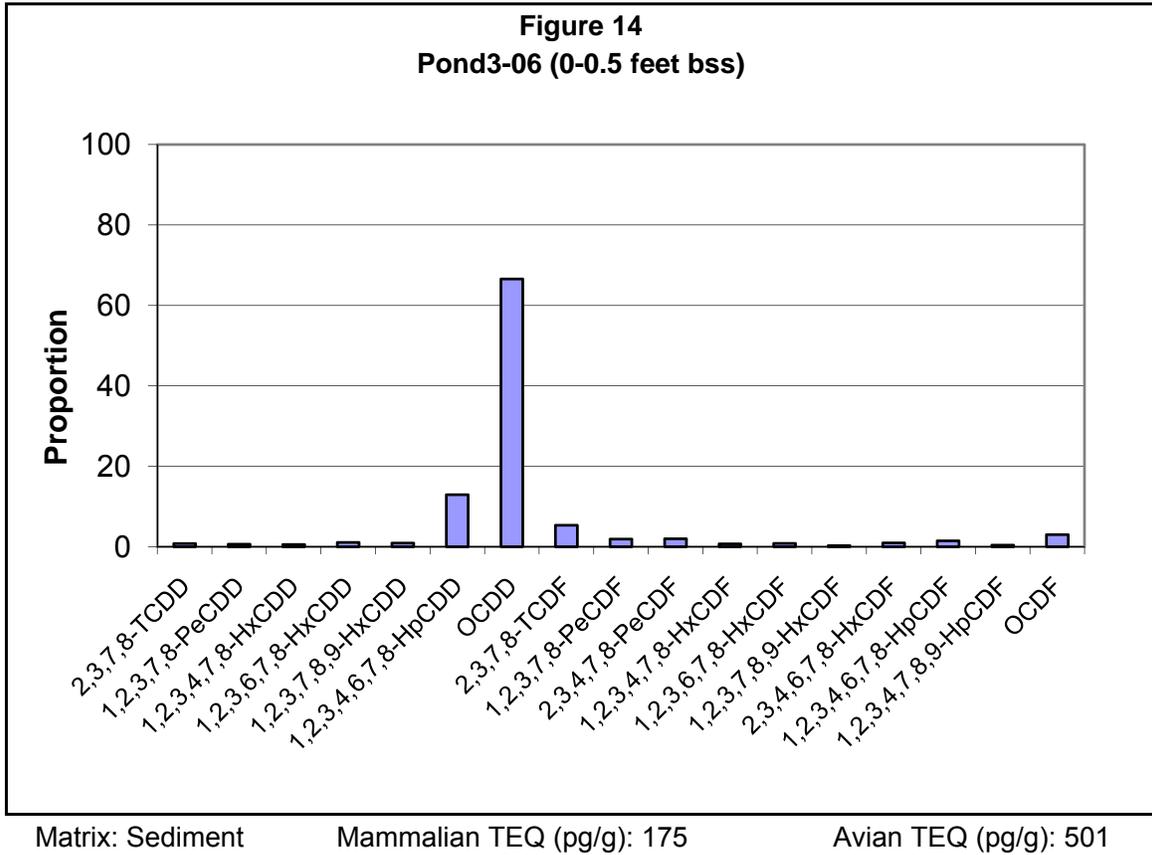


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

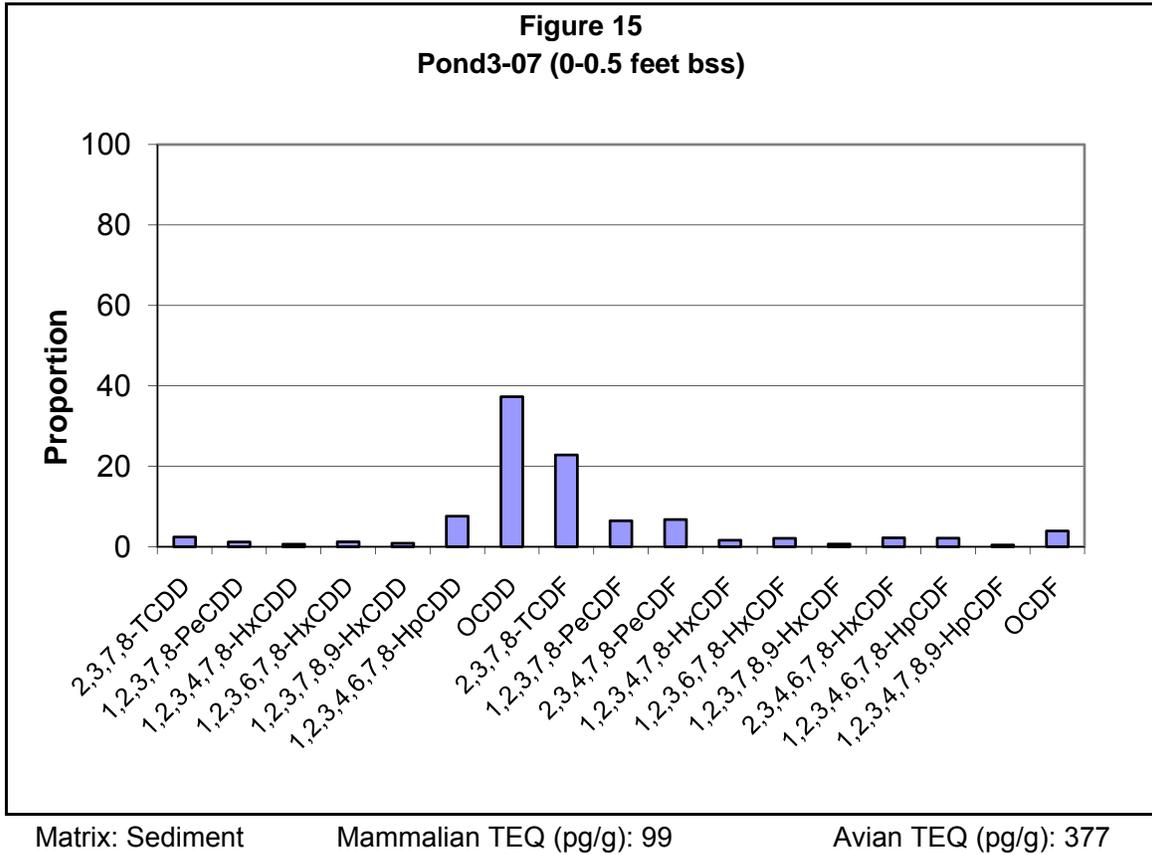


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

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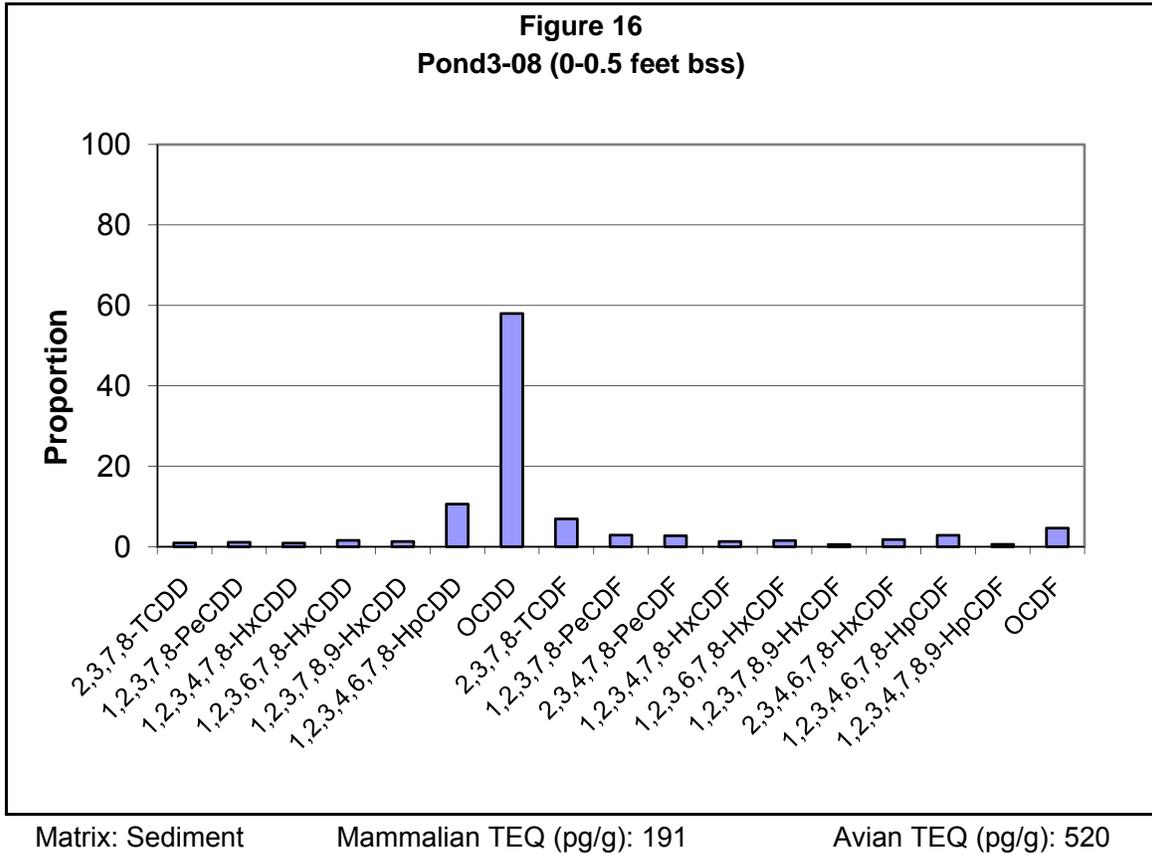


Category based on visual inspection of dioxin profile: muni

Consistent with waste wood ash because: presence of 2,3,7,8-TCDF ($\geq 5\%$); absence of OCDD (much less than 60%); presence of most dioxin and furan congeners ($\geq 1.5\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

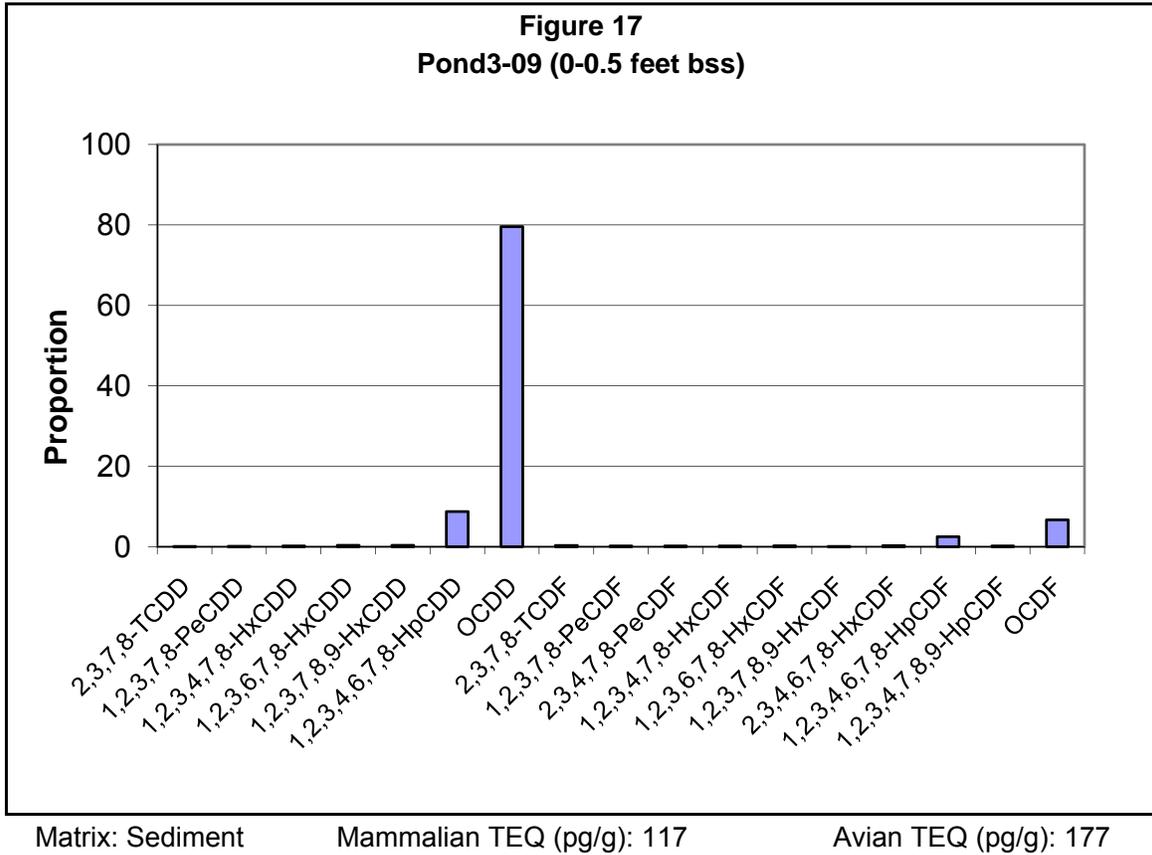


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and waste wood ash.

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 3**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

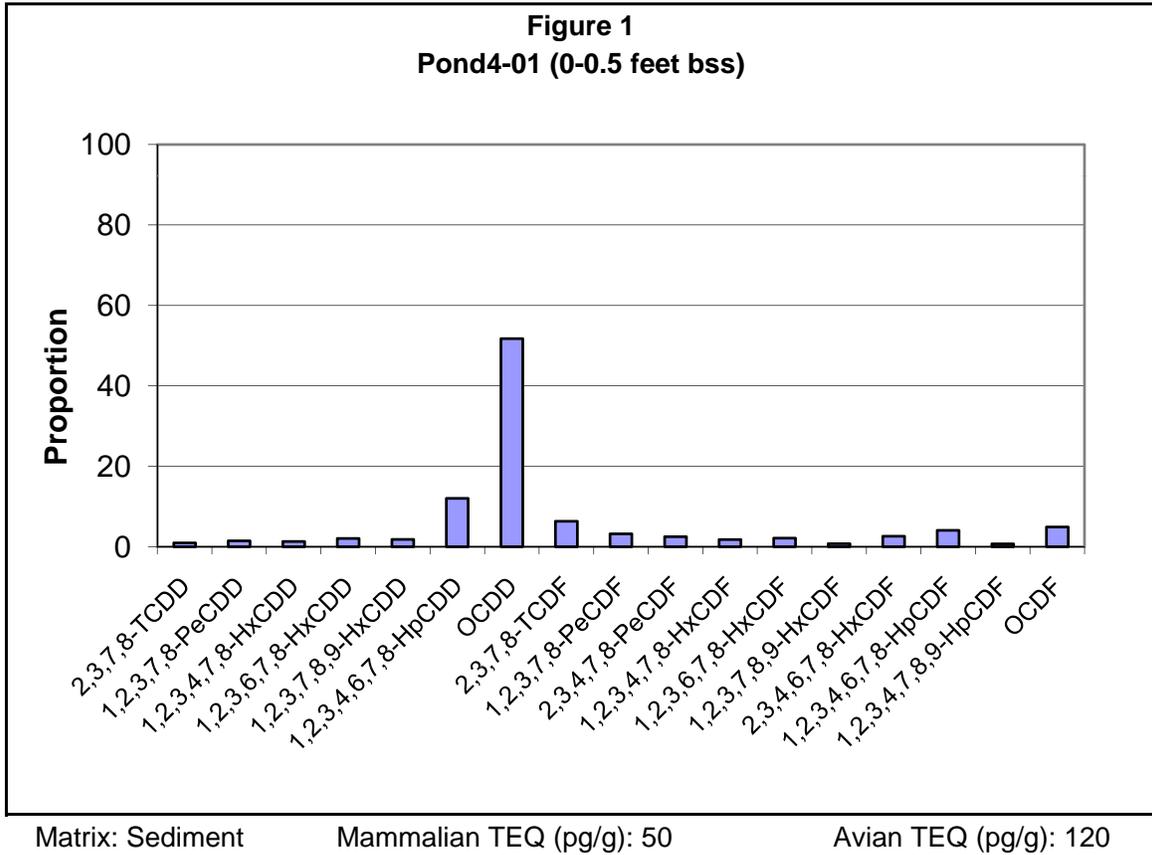
TEQ = toxic equivalent

Figures – Pond 4

Dioxin Congener Profiles:
Southern Ponds Sediments –
Pond 4

**Attachment G-5
Dioxin Congener Profiles
Southern Ponds Sediments - Pond 4**

**Remedial Investigation Report Operable Unit E
Former Georgia-Pacific Wood Products Facility
Fort Bragg, California**



Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil, natural wood ash, waste wood ash and/or other sources.

Acronyms and Abbreviations:

bss = below sediment surface	PeCDD = pentachlorodibenzo-p-dioxin
HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin	PeCDF = pentachlorodibenzofuran
HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran	pg/g = picogram per gram
HxCDD = hexachlorodibenzo-p-dioxin	TCDD = 2,3,7,8- tetrachlorodibenzo-p-di
HxCDF = hexachlorodibenzofuran	TCDF = 2,3,7,8-tetrachlorodibenzofuran
OCDD = octachlorodibenzo-p-dioxin	TEQ = toxic equivalent
OCDF = octachlorodibenzofuran	



Attachment G-6

Ponds 5 and 9 Sediments Dioxin
Congener Profiles

Tables

Dioxin/Furan Source
Classifications: Ponds 5 and 9
Sediments

**Attachement G-6
Table 1. Dioxin/Furan Source Classifications
Ponds 5 and 9 Sediments**

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Location ID	Depth (ft bss)	Sample Date	Sample ID	Mammalian TEQ (pg/g)	Avian TEQ (pg/g)	Dioxin/Furan Source
Pond 5						
DP-5.63	0 to 0.5 ft	4/25/06	DP-5.63-0-0.5	23	41	mixture
Pond5-01	0 to 1 ft	3/14/08	Pond5-01-0-1	70	75	mixture
Pond5-02	0 to 1 ft	3/14/08	Pond5-02-0-1	30	36	ambient
Pond5-03	0 to 0.5 ft	3/18/08	Pond5-03-0-0.5	20	22	ambient
Pond 9						
Pond9-01	0 to 0.5 ft	6/18/09	Pond9-01-0-0.5	7.9	9.7	ambient

Notes:

ambient =congener profile consistent with ambient dioxin/furans.

mixture = congener profile consistent with multiple sources of dioxin/furans.

Acronyms and Abbreviations:

bss = below sediment surface

ft = feet

pg/g = picogram per gram

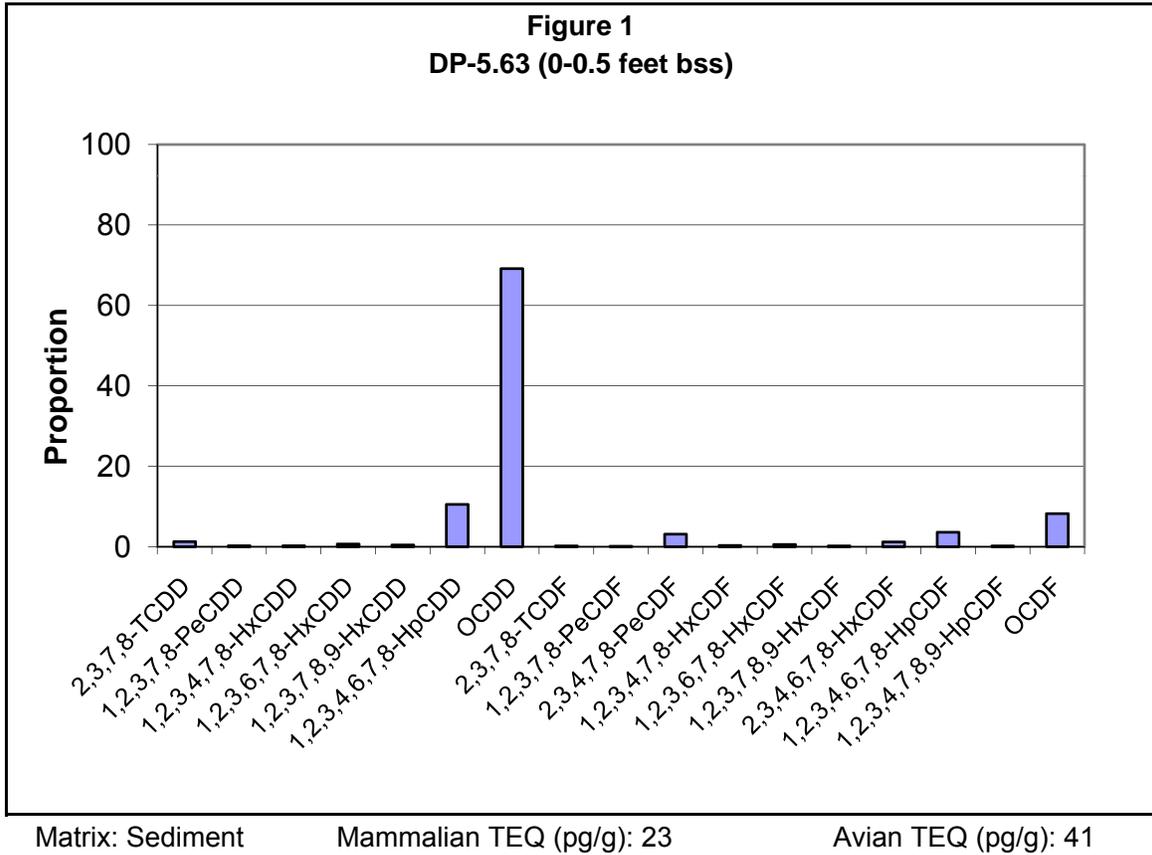
TEQ = toxic equivalent

Figures – Pond 5

Dioxin Sample Congener Profiles:
Ponds 5 Sediments

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 5**

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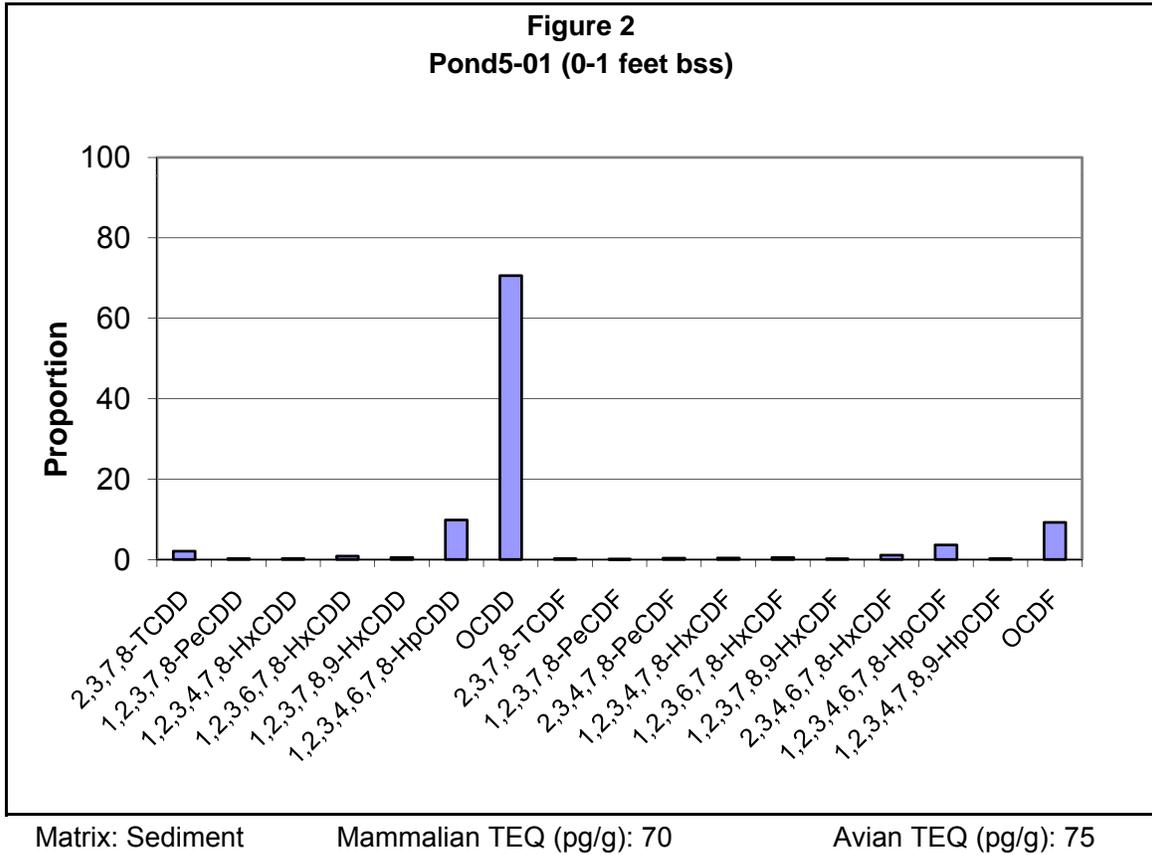


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 5**

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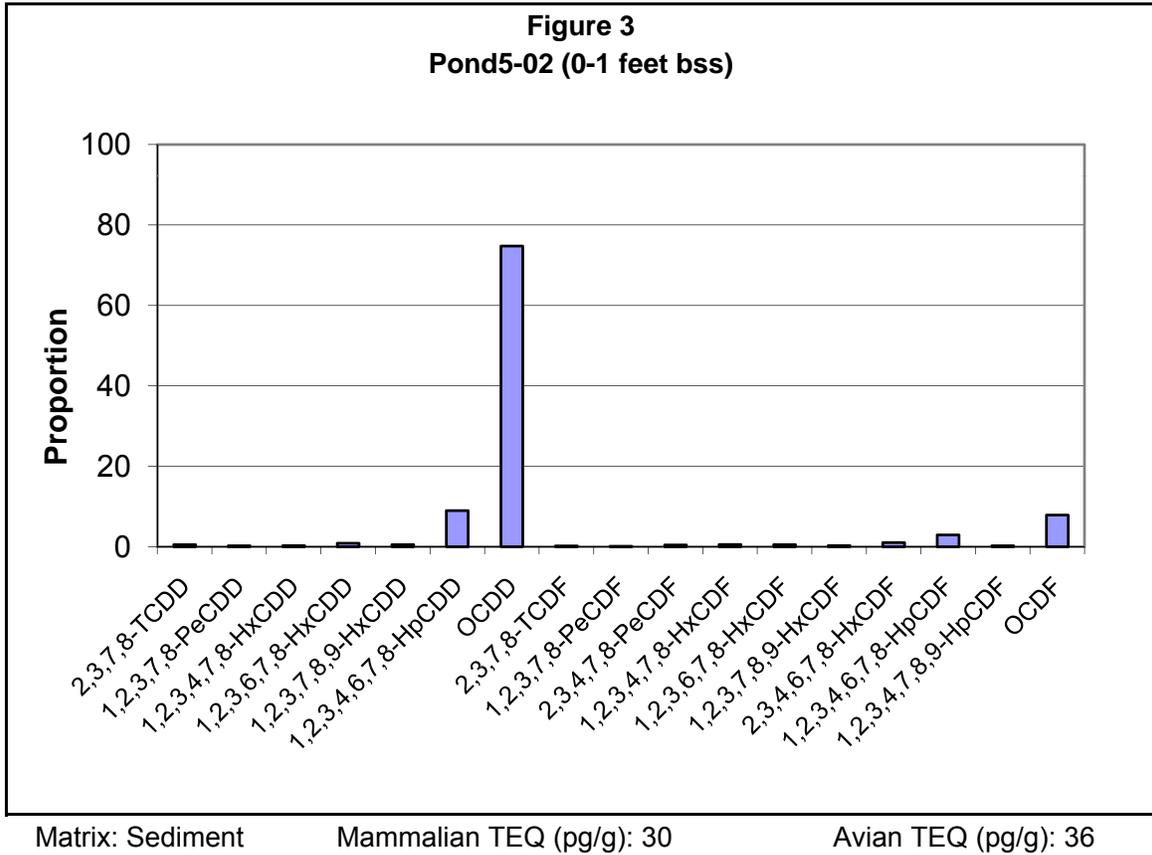


Category based on visual inspection of dioxin profile: mixture

Inconsistent with any single source profile, appears to be a mixture of ambient soil and natural wood ash.

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 5**

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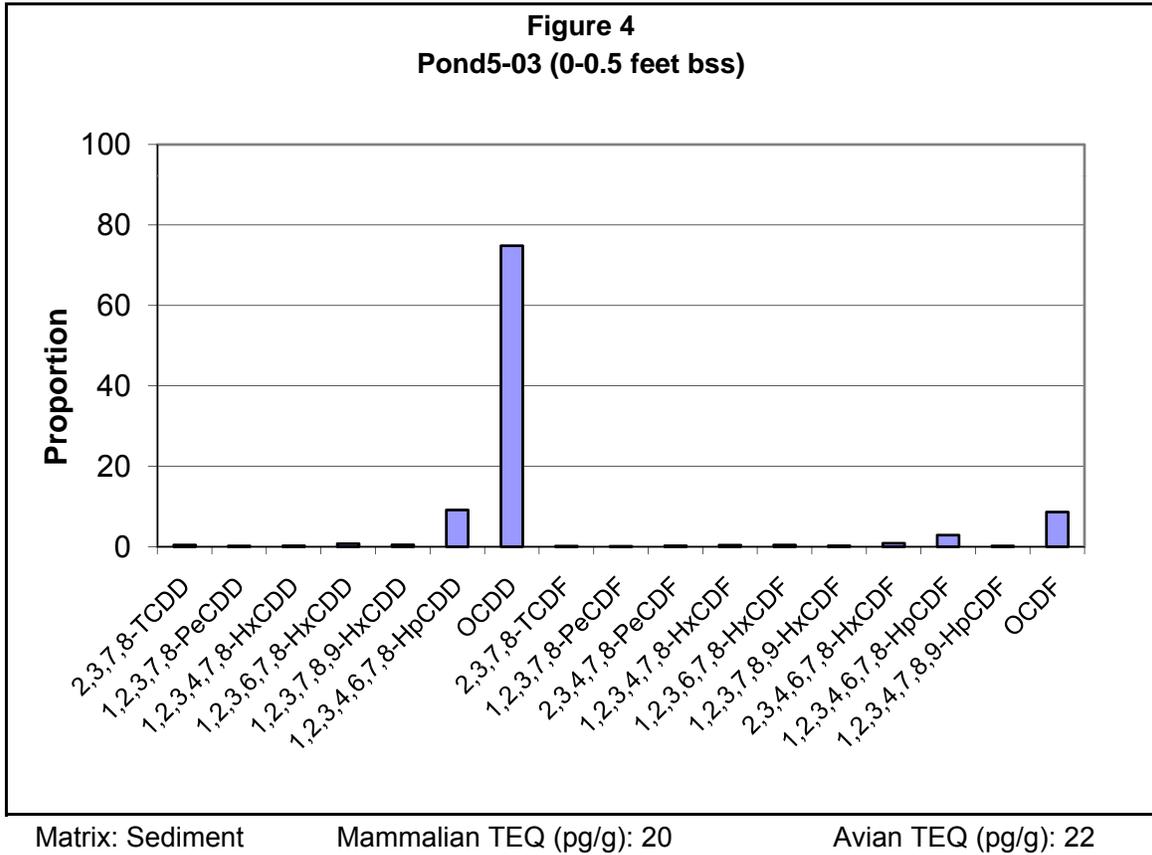


Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 5**

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Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 5**

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Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

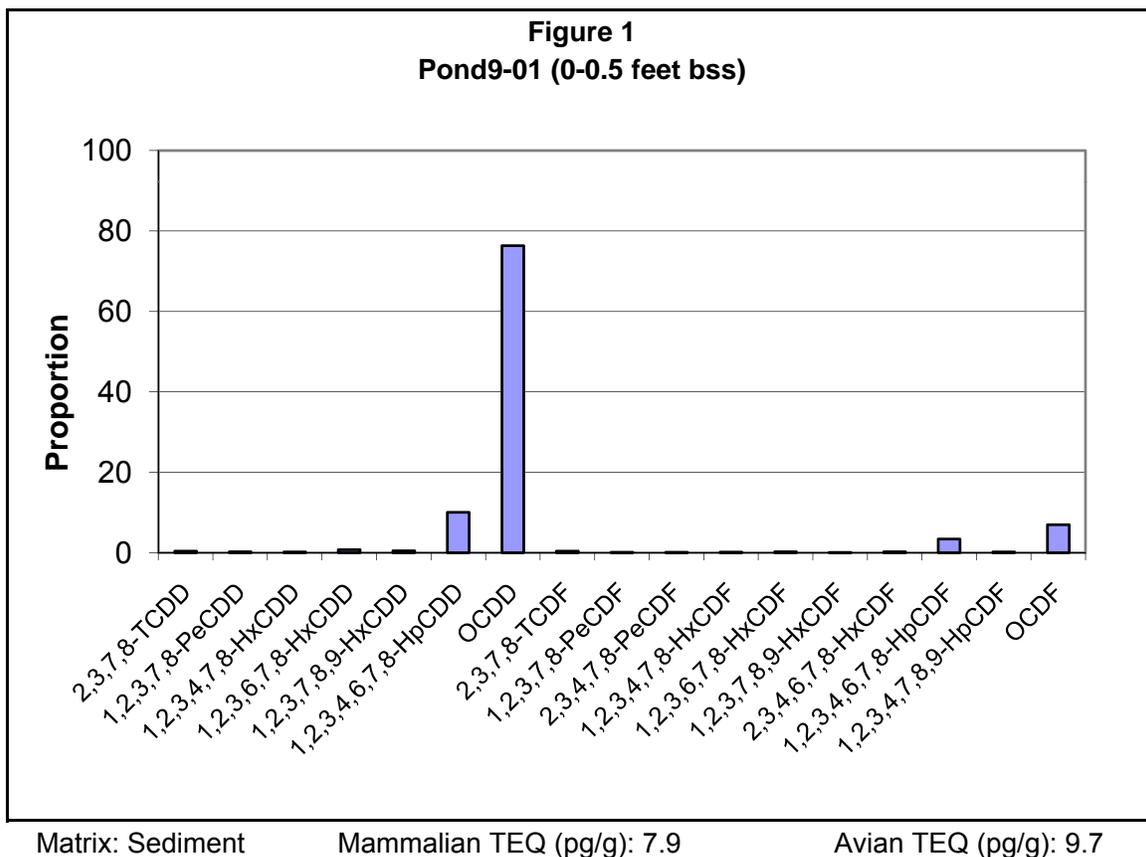
TEQ = toxic equivalent

Figures – Pond 9

Dioxin Sample Congener Profiles:
Ponds 9 Sediments

**Attachment G-6
Dioxin Sample Congener Profiles
Ponds 5 and 9 Sediments - Pond 9**

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Category based on visual inspection of dioxin profile: ambient

Consistent with ambient because: four dominant congeners present (OCDD, OCDF, 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8-HpCDF); presence of OCDD ($\geq 60\%$); general absence of tetra-, penta-, and hexa-chlorinated congeners ($\leq 1\%$).

Acronyms and Abbreviations:

bss = below sediment surface

HpCDD = 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin

HpCDF = 1,2,3,4,6,7,8- heptachlorodibenzofuran

HxCDD = hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

OCDD = octachlorodibenzo-p-dioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

pg/g = picogram per gram

TCDD = 2,3,7,8- tetrachlorodibenzo-p-dioxin

TCDF = 2,3,7,8-tetrachlorodibenzofuran

TEQ = toxic equivalent

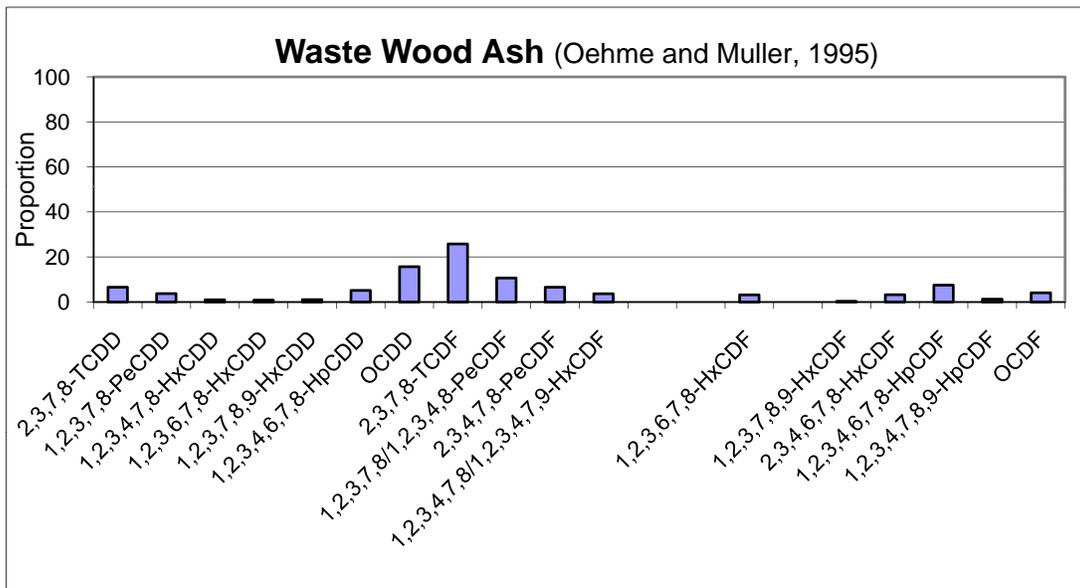
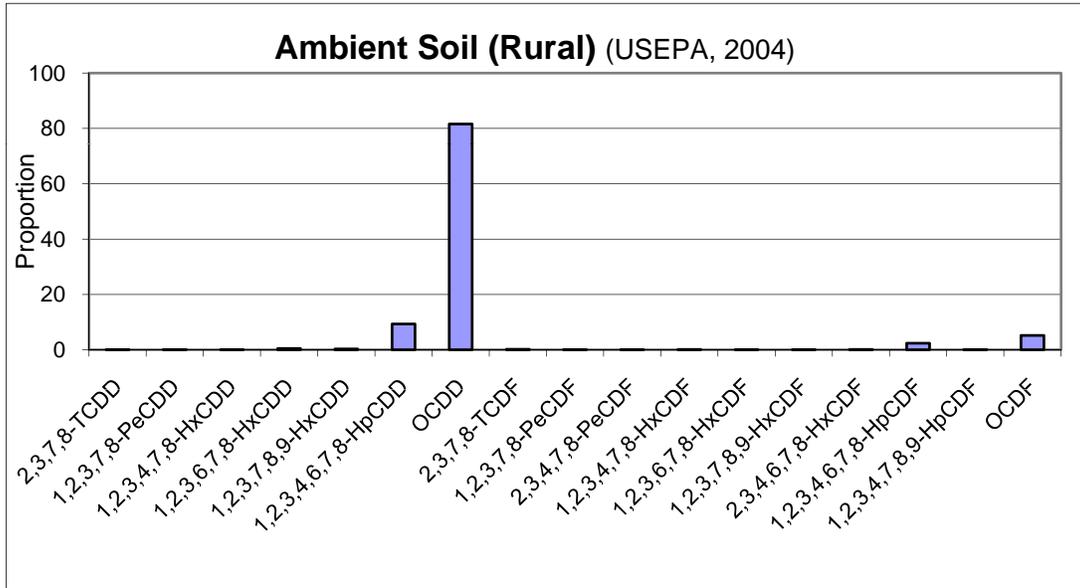


Attachment G-7

Literature-Based Dioxin Congener
Source Profiles

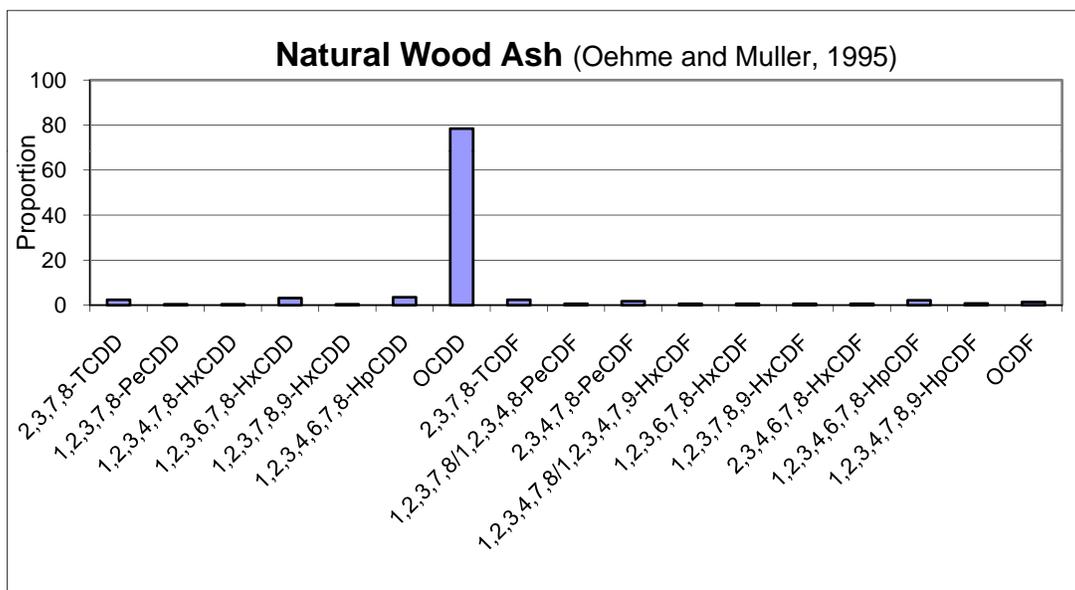
**Attachment G-7
Literature-Based Dioxin Congener Source Profiles**

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**Attachment G-7
Literature-Based Dioxin Congener Source Profiles**

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References:

Oehme, M. and M. Muller. 1995. Levels and congener patterns of polychlorinated dibenzo-*p*-dioxins and dibenzofurans in solid residues from wood-fired boilers: influence of combustion conditions and fuel type. *Chemosphere* 30(8):1527-1539.

USEPA. 2004. *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds*. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.