**Boring ID: HZBS0158**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, yellowish brown (10YR 5/4), loose, dry, fine gravel consisting of sandstone fragments, mica present [Alluvium]</td>
<td></td>
</tr>
</tbody>
</table>

- **Total Depth (ft):** 0.5
- **Comments:** About 2 ft SW of gravel road, gravel and partial vegetative cover at surface

---

Collected soil sample S001 at 12:10.
Backfilled with auger cuttings.

**Notes:**
- Total Depth = 0.5 ft; terminated prior to refusal.
- **Hand Auger**
- **Borehole Diam. (in.):** 3
- **Depth 1st H₂O (ft):** N/A
- **Drill Rig Type/Method:** Hand Auger
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Site:** Happy Valley South - HVS-2A
- **Drill Finish Date:** 07-01-2009
- **Drill Start Date:** 07-01-2009
- **Logged By:** S. Dawson
- **Reviewed By:** M. Milman-Barris, P.G.
- **Describer:** Mike Hoehn
- **Sampled By:** M. Milman-Barris, P.G.
Total Depth = 0.7 ft; refusal on Chatsworth Formation Sandstone.

Collected soil sample S001 at 12:20.

Backfilled with auger cuttings.

Sample Type: Silty Sand, yellowish brown (10YR 5/4), loose, dry, fine sandstone gravel, mica present [Fill]

Depth 1st H₂O (ft): N/A

PID (ppm) Date / Time: N/A

Description:

- Total Depth = 0.7 ft; refusal on Chatsworth Formation Sandstone.
- Collected soil sample S001 at 12:20.
- Backfilled with auger cuttings.
**Boring ID: HZBS0160**

<table>
<thead>
<tr>
<th>Job Number: 1891614</th>
<th>Site: Happy Valley South - HVS-2A</th>
</tr>
</thead>
</table>

**Borehole Diam. (in.): 3**

**Total Depth (ft): 0.7**

**Northing (ft): 267130.06**

**Easting (ft): 1796256.45**

**Drill Start Date: 07-01-2009**

**Start Time: 12:28**

**Logged By: S. Dawson**

**Review By: M. Milman-Barris, P.G.**

**Drill Finish Date: 07-01-2009**

**Finish Time: 12:32**

**Drilling Contractor: B.L. Hall**

**Field Instrumentation: N/A**

**Driller’s Name: Mike Hoehn**

**Depth 1st H₂O (ft): N/A**

**Date / Time: N/A**

**Drill Rig Type/Method: Hand Auger**

**Depth H₂O After Drilling (ft): N/A**

**Date / Time: N/A**

**Comments: In flat, densely vegetated area, no debris**

**Well Comp. Date: N/A**

**Completion Time: N/A**

**Samplers: Grab sample collected in 6-inch stainless steel sleeve**

**Soil Backfill Date: 07-01-2009**

**Backfill Time: 12:35**

### Sample Interval Retained

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, yellowish brown (10YR 5/4), loose, dry, fine gravel consisting of sandstone fragments, mica present [Alluvium]</td>
<td>5 10 20 30 35</td>
</tr>
</tbody>
</table>

- **Total Depth = 0.7 ft; terminated prior to refusal.**
- Collected soil sample S001 at 12:30.
- Backfilled with auger cuttings.
**MWH**

Borehole Diam. (in.): 3  
Total Depth (ft): 1.8

**Boring ID: HZBS0161**

Northing (ft): 266960.85  
Easting (ft): 1796251.19

Project: SSFL ISRA Sampling - Outfall 008 Area

Job Number: 1891614  
Site: Happy Valley South - HVS-2A

Logged By: S. Dawson  
Reviewed By: M. Milman-Barris, P.G.

Drill Start Date: 07-01-2009  
Start Time: 11:55

Logged By: S. Dawson  
Reviewed By: M. Milman-Barris, P.G.

Drill Finish Date: 07-01-2009  
Finish Time: 12:05

Drilling Contractor: B.L. Hall  
Field Instrumentation: N/A

Depth 1st H₂O (ft): N/A  
Date / Time: N/A

Drill Rig Type/Method: Hand Auger

Depth H₂O After Drilling (ft): N/A  
Date / Time: N/A

Driller's Name: Mike Hoehn

Comments: In flat area along gravel road, 4 ft SW of HVBF33, vegetation 3 ft to E

Well Comp. Date: N/A  
Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: 07-01-2009  
Backfill Time: 12:06

---

**USCS Soil Classification**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM/ML</td>
<td>Silty Sand / Sandy Silt, brownish yellow (10YR 6/6), loose, dry, slightly clayey, mica present [Alluvium]</td>
</tr>
<tr>
<td>2</td>
<td>Total Depth = 1.8 ft; refusal on Chatsworth Formation Sandstone.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collected soil sample S001 at 12:00.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Backfilled with auger cuttings.</td>
</tr>
</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Medium Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>30</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Log of Boring OUTFALL008.GPJ  BOEING.GDT  12/16/09

**Boring ID:** HZBS0162

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** In flat, vegetated area with surficial ash, outcrop and 6-ft boulder nearby

---

**Sample Collectors:**
- Grab sample collected in 6-inch stainless steel sleeve

**Drilling Contractor:** B.L. Hall

**Reviewed By:** M. Milman-Barris, P.G.

**Driller's Name:** Mike Hoehn

**Drilling Contractor:** B.L. Hall

- **Drill Rig Type/Method:** Hand Auger

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Soil Backfill Date:** 07-01-2009

**Backfill Time:** 13:03

**In flat, vegetated area with surficial ash, outcrop and 6-ft boulder nearby**
**Boring ID: HZBS0163**

**Borehole Diam. (in.):** 3  
**Total Depth (ft):** 1.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 267214.67  
**Easting (ft):** 1796302.54  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A

**Drill Start Date:** 07-01-2009  
**Start Time:** 12:48  
**Logged By:** S. Dawson  
**Reviewed By:** M. Milman-Barris, P.G.

**Drill Finish Date:** 07-01-2009  
**Finish Time:** 12:52  
**Drilling Contractor:** B.L. Hall  
**Field Instrumentation:** N/A

**Depth 1st H$_2$O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Hand Auger

**Depth H$_2$O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Mike Hoehn

**Comments:** On steep, sparsely vegetated slope, burned wood/organics at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** 07-01-2009  
**Backfill Time:** 12:54

---

### Sample Interval Retained

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>SM (Silty Sand)</td>
<td>Silty Sand, yellowish brown (10YR 5/4), loose, dry, mica present (Alluvium)</td>
</tr>
</tbody>
</table>

**Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.**

**Collected soil sample S001 at 12:50.**

**Backfilled with auger cuttings.**

---

**Easting (ft):** 1796302.54  
**Start Time:** 12:48  
**Finish Time:** 12:52  
**Logged By:** S. Dawson  
**Reviewed By:** M. Milman-Barris, P.G.

**Drill Finish Date:** 07-01-2009  
**Finish Time:** 12:52  
**Drilling Contractor:** B.L. Hall  
**Field Instrumentation:** N/A

**Depth 1st H$_2$O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Hand Auger

**Depth H$_2$O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Mike Hoehn

**Comments:** On steep, sparsely vegetated slope, burned wood/organics at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** 07-01-2009  
**Backfill Time:** 12:54

---

### Sample Interval Retained

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>SM (Silty Sand)</td>
<td>Silty Sand, yellowish brown (10YR 5/4), loose, dry, mica present (Alluvium)</td>
</tr>
</tbody>
</table>

**Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.**

**Collected soil sample S001 at 12:50.**

**Backfilled with auger cuttings.**
**Boring ID: HZBS0164**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, brown (10YR 5/3), loose, dry to moist, mica present [Alluvium]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 1.2 ft; terminated prior to refusal.</td>
</tr>
</tbody>
</table>

Collected soil sample S001 at 12:40.
Backfilled with auger cuttings.

<table>
<thead>
<tr>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
</tr>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

**Comments:** In slight gully densely vegetated with brush, ash at surface

**Reviewed By:** M. Milman-Barris, P.G.
**Boring ID: HZBS0165**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td>Sandy Lean Clay, dark brown (10YR 3/3), soft, moist, subrounded sand, low plasticity fines, no cementation, trace rootlets and insects [Alluvium]</td>
<td>tr 5 25 70</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 0.5 ft; terminated prior to refusal. Collected soil sample S001 at 08:53. Backfilled with auger cuttings.</td>
<td></td>
</tr>
</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2B

**Job Number:** 1891614

**Logged By:** S. Valenzuela

**Reviewed By:** M. Milman-Barris, P.G.

**Borehole Diam. (in.):** 3

**Total Depth (ft):** 0.5

**Northing (ft):** 268903.59

**Easting (ft):** 1796146.27

**Drill Start Date:** 07-01-2009

**Start Time:** 08:50

**Drill Finish Date:** 07-01-2009

**Finish Time:** 08:55

**Drill Rig Type/Method:** Hand Auger

**Driller's Name:** Paul Iler

**Comments:** Tall grass and weeds at surface

**Well Comp. Date:** N/A

**Soil Backfill Date:** 07-01-2009

**Backfill Time:** 08:55

**Tall grass and weeds at surface**

**Grab sample collected in 6-inch stainless steel sleeve**

**Field Instrumentation:** N/A

**Total Depth 1st H₂O (ft):** N/A

**Depth H₂O After Drilling (ft):** N/A

**Date / Time:** N/A

**Drill Rig Type/Method:** N/A

**Driller's Name:** N/A

**Remarks:**

- Collected soil sample S001 at 08:53.
- Backfilled with auger cuttings.
**LOG OF BORING OUTFALL 008.GPJ  BOEING.GDT  12/16/09**

**Boring ID: HZBS0166**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>CL</td>
<td>Sandy Lean Clay, light yellowish brown (10YR 6/4), soft, dry, subrounded sand, low plasticity fines, medium dry strength, no cementation, trace rootlets [Alluvium]</td>
</tr>
</tbody>
</table>

**Comments:** Tall grass and exposed soil at surface

**Soil:**
- **Water Level:** 0
- **Sample Type:** 10
- **Sample Interval:** 0.5 ft
- **Sample Retained:** 0.5 ft
- **Sample Recovery:** 100%

**Soil Backfill Date:** 07-01-2009

**Backfill Time:** 09:05

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Driller's Name:** Paul Ille

**Drill Rig Type/Method:** Hand Auger

**Job Number:** 1891614

**Logged By:** S. Valenzuela

**Drilling Contractor:** B.L. Hall

**Field Instrumentation:** N/A

**Site:** Happy Valley South - HVS-2B

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Easting (ft):** 268916.73

**Northing (ft):** 1796101.94

**Start Time:** 07-01-2009

**Finish Time:** 07-01-2009

**Depth 1st H2O (ft):** N/A

**Depth H2O After Drilling (ft):** N/A

**Total Depth (ft):** 0.5

**Total Depth:** 0.5 ft; terminated prior to refusal.

**Collected soil sample S001 at 09:04.**

**Backfilled with auger cuttings.**
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Interval</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0</td>
<td>CL/ML</td>
<td>Sandy Silty Clay, light yellowish brown (10YR 6/4), medium stiff, dry, low plasticity fines, low to medium dry strength [Alluvium]</td>
</tr>
<tr>
<td>1</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td></td>
<td>becomes soft, moist</td>
</tr>
<tr>
<td>2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td></td>
<td>Total Depth = 1.5 ft; terminated prior to refusal.</td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>3</td>
<td></td>
<td>Collected soil sample S001 at 09:22.</td>
</tr>
<tr>
<td>4</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td></td>
<td>Backfilled with auger cuttings.</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>9</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>9</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Est. % of Soil**

- **Gravel**: 5
- **Coarse Sand**: 10
- **Med. Sand**: 20
- **Fine Sand**: 65
- **Silt/Clay**: 65

**Comments**: Tall grass and exposed soil at surface

**Drill Rig Type/Method**: Hand Auger

**Reviewed By**: M. Milman-Barris, P.G.
**Boring ID: HZBS0168**

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2B

**Borehole Diam. (in.):** 3  
**Total Depth (ft):** 0.8

**Northing (ft):** 266929.89  
**Easting (ft):** 1796127.71  
**Job Number:** 1891614

**Drill Finish Date:** 07-01-2009  
**Start Time:** 09:25  
**Logged By:** S. Valenzuela

**Drill Rig Type/Method:** Hand Auger

**Sample Interval Retained:**  
**Sample Type:** Sandy Lean Clay, yellowish brown (10YR 5/4), soft to medium stiff, dry, low to medium plasticity fines, medium dry strength, trace rootlets [Alluvium]

**Total Depth = 0.8 ft; terminated prior to refusal.**

**Collected soil sample S001 at 09:35.**

**Backfilled with auger cuttings.**

### Sample Collection

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>CL</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Sandy Lean Clay, yellowish brown (10YR 5/4), soft to medium stiff, dry, low to medium plasticity fines, medium dry strength, trace rootlets [Alluvium]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Total Depth = 0.8 ft; terminated prior to refusal.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Collected soil sample S001 at 09:35.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Backfilled with auger cuttings.</td>
</tr>
</tbody>
</table>

**Est. % of Soil:**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>tr</td>
<td>10</td>
<td>20</td>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>
### LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09

**MWH**

**Boring ID: HZBS0169**

<table>
<thead>
<tr>
<th>Borehole Diam. (in.):</th>
<th>Total Depth (ft):</th>
<th>Project: SSFL ISRA Sampling - Outfall 008 Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Northing (ft):</th>
<th>Easting (ft):</th>
<th>Project: SSFL ISRA Sampling - Outfall 008 Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>266925.69</td>
<td>1796103.34</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drill Start Date:</th>
<th>Start Time:</th>
<th>Logged By:</th>
<th>Drilling Contractor:</th>
<th>Field Instrumentation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-01-2009</td>
<td>09:45</td>
<td>S. Valenzuela</td>
<td>B.L. Hall</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth 1st H₂O (ft):</th>
<th>Date / Time:</th>
<th>Drill Rig Type/Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Hand Auger</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth H₂O After Drilling (ft):</th>
<th>Date / Time:</th>
<th>Driller’s Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Paul Iler</td>
</tr>
</tbody>
</table>

**Comments:**
- Tall grass and exposed soil at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Sandy Silt, yellowish brown (10YR 5/4), medium stiff, dry, low plasticity fines, low dry strength, trace rootlets [Alluvium]
- Total Depth = 1.6 ft; terminated prior to refusal.
- Collected soil sample S001 at 09:53.
- Backfilled with auger cuttings.

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML</td>
<td>Sandy Silt, yellowish brown (10YR 5/4), medium stiff, dry, low plasticity fines, low dry strength, trace rootlets [Alluvium]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>tr</td>
<td>10</td>
<td>20</td>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>
**MWH**

**Boring ID: HZBS0170**

**Borehole Diam. (in.):** 3  
**Total Depth (ft):** 1.6  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266936.57  
**Easting (ft):** 1796095.42  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2B

**Drill Start Date:** 07-01-2009  
**Start Time:** 09:55  
**Logged By:** S. Valenzuela  
**Reviewed By:** M. Milman-Barris, P.G.

**Drill Finish Date:** 07-01-2009  
**Finish Time:** 10:05  
**Drilling Contractor:** B.L. Hall  
**Field Instrumentation:** N/A

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Hand Auger

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Paul Iler

**Comments:** Tall grass and exposed soil at surface

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Sample Retained</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PIP (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Graphic Log</td>
<td>Sandy Silt, yellowish brown (10YR 5/4), medium stiff, dry, nonplastic fines, low dry strength [Alluvium]</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SP-SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Graphic Log</td>
<td>Poorly Graded Sand with Silt, yellow (10YR 7/6), loose, moist, no cementation [Alluvium]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 1.6 ft; refusal on weathered Chatsworth Formation Sandstone.</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Collected soil sample S001 at 10:01.</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Backfilled with auger cuttings.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Sample Retained</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PIP (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Med. Sand</td>
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<td>4</td>
<td></td>
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<td></td>
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<td></td>
<td>Coarse Sand</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Silt/Clay</td>
<td></td>
</tr>
<tr>
<td>6</td>
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</tr>
</tbody>
</table>

**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Soil Backfill Date:** 07-01-2009  
**Backfill Time:** 10:05

**Project:** Happy Valley South - HVS-2B

**Driller’s Name:** Paul Iler

**Logging: B.L. Hall**

**Field Instrumentation:** N/A

**Reviewed By:** M. Milman-Barris, P.G.
Borehole Diam. (in.): 3  Total Depth (ft): 1.0  Project: SSFL ISRA Sampling - Outfall 008 Area
Northing (ft): 266951.44  Easting (ft): 1796112.78  Job Number: 1891614  Site: Happy Valley South - HVS-2B
Drill Start Date: 07-01-2009  Start Time: 10:00  Logged By: S. Valenzuela  Reviewed By: M. Milman-Barris, P.G.
Drill Finish Date: 07-01-2009  Finish Time: 10:20  Drilling Contractor: B.L. Hall  Field Instrumentation: N/A

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, yellowish brown (10YR 5/4), medium dense, moist</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** Sparse vegetation and exposed soil at surface

Well Comp. Date: N/A  Completion Time: N/A
Sampler: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: 07-01-2009  Backfill Time: 10:20

**Descriiption:**

- Total Depth = 1.0 ft; terminated prior to refusal.
- Collected soil sample S001 at 10:16.
- Backfilled with auger cuttings.
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>Water Level</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count 6”</th>
<th>PID (ppm)</th>
<th>Sample Interval Retained</th>
<th>SM</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>4</td>
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<td></td>
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<tr>
<td>5</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
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<td>7</td>
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<td>8</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>9</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
- Silty Sand, yellowish brown (10YR 5/4), medium dense, moist
  - Total Depth = 0.5 ft; terminated prior to refusal.
  - Collected soil sample S001 at 10:28.
  - Backfilled with auger cuttings.

**Est. % of Soil:**
- Gravel: 10%
- Coarse Sand: 70%
- Med. Sand: 20%

**Logs:**
- **LOG OF BORING OUTFALL008.GPJ**
- **BOEING.GDT**

**Project Details:**
- **MWH**
- **Boring ID:** HZBS0172
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-2B
- **Logged By:** S. Valenzuela
- **Drilling Contractor:** B.L. Hall
- **Reviewed By:** M. Milman-Barris, P.G.
- **Drill Rig Type/Method:** Hand Auger
- **Driller’s Name:** Paul Iler

**Additional Details:**
- **Drill Start Date:** 07-01-2009
- **Drill Finish Date:** 07-01-2009
- **Well Comp. Date:** N/A
- **Backfill Time:** 10:30
- **Soil Backfill Date:** 07-01-2009
- **Comments:** Tall grass and exposed soil at surface
- **Sample Type:** Grab sample collected in 6-inch stainless steel sleeve
- **Sample Interval Retained:** N/A
- **Depth (feet):** N/A
- **Graphic Log:** SM
- **PID (ppm):** 0.5
- **Water Level:** Retained
- **Field Instrumentation:** N/A
- **Reviewed By:** Paul Iler
- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Soil Backfill Date:** 07-01-2009
- **Backfill Time:** 10:30
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>CL</td>
<td>Lean Clay, yellowish brown (10YR 5/4), soft, dry to moist, no cementation, no debris, no odor, no staining [Fill]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>plastic and metal debris (plastic netting, non-corroded metal coil)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>Collected soil samples S001 at 09:40 and S002 at 09:57.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Backfilled with auger cuttings.</td>
<td></td>
</tr>
</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>SiltyClay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Boring ID: HZBS0174**

**Borehole Diam. (in.):** 3  
**Total Depth (ft):** 5.0

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 267084.12  
**Easting (ft):** 1796209.71

**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A

**Drill Start Date:** 08-20-2009  
**Start Time:** 10:27

**Logged By:** M. Milman-Barris  
**Reviewed By:** S. Valenzuela, P.G.

**Drill Finish Date:** 08-20-2009  
**Finish Time:** 10:56

**Drilling Contractor:** B.L. Hall  
**Field Instrumentation:** PID

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A

**Drill Rig Type/Method:** Hand Auger (no slam bar)

**Sample Interval Retained**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blown Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td>Lean Clay, yellowish brown (10YR 5/4), soft, dry to moist, very weak cementation, no debris [Fill]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lean Clay with Sand, light yellowish brown (10YR 5/4), soft, dry to moist, no cementation, no debris [Weathered Chatsworth Formation?]</td>
<td></td>
</tr>
</tbody>
</table>

**Northing (ft):** 267084.12  
**Easting (ft):** 1796209.71

**Start Time:** 10:27  
**Finish Time:** 10:56

**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A

**Logged By:** M. Milman-Barris  
**Reviewed By:** S. Valenzuela, P.G.

**Drill Finish Date:** 08-20-2009  
**Finish Time:** 10:56

**Drilling Contractor:** B.L. Hall  
**Field Instrumentation:** PID

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A

**Drill Rig Type/Method:** Hand Auger (no slam bar)

**Sample Interval Retained**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blown Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td>Lean Clay, yellowish brown (10YR 5/4), soft, dry to moist, very weak cementation, no debris [Fill]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lean Clay with Sand, light yellowish brown (10YR 5/4), soft, dry to moist, no cementation, no debris [Weathered Chatsworth Formation?]</td>
<td></td>
</tr>
</tbody>
</table>

**Total Depth = 5.0 ft; terminated prior to refusal.**

**Collected soil samples S001 at 10:35 and S002 at 10:56.**

**Backfilled with auger cuttings.**

**Comments:** NW end of sinkhole next to rusted pipeline, dry bare soil at surface

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** 08-20-2009  
**Backfill Time:** NR

**Driller’s Name:** Allison Ruotolo

**.logger:** S. Valenzuela, P.G.
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>SM</td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td></td>
<td>Silty Sand, yellowish brown (10YR 5/6), loose to medium dense, dry to moist, roots and rootlets, no odor, no staining [Fill]</td>
<td>5 5 25 30 35</td>
</tr>
</tbody>
</table>

Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.
Collected soil samples S001 at 13:50 and S002 at 14:10.
Backfilled with auger cuttings.
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Sandstone, dark yellowish brown (10YR 4/4), weathered, hard, friable, moist [Chatsworth Formation]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, yellowish brown (10YR 4/4), dense, moist and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4) to brown (10YR 4/3), medium dense, dry to moist, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>fewer roots and rootlets</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>grades without roots and rootlets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4) to brown (10YR 4/3), medium dense, dry to moist, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense, moist and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>fewer roots and rootlets</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td>grades without roots and rootlets</td>
</tr>
</tbody>
</table>
Depth of \[ H_2O \] (ft): 2

Drill Start Date: 10-01-2009
Start Time: NR

Drill Finish Date: 10-06-2009
Finish Time: NR

Drilling Contractor: Envirosolve

Driller's Name: A. Goldenberg

Date / Time: 09:15

Comments: Bare soil at surface

Sampled: Grab sample collected in 6-inch stainless steel sleeve

Total Depth = 25.0 ft; terminated prior to refusal per Ben Stewart.

Collected soil samples S001 at 15:00 and S002 at 15:15.

Backfilled with auger cuttings.

---

Sandstone, dark yellowish brown (10YR 4/4), weathered, hard, friable, moist [Chatsworth Formation] (continued)
**Boring ID: HZBS0178**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand with Gravel, yellowish brown (10YR 5/8 to 5/4), medium dense, dry, roots and rootlets, no odor, no staining [Fill]</td>
<td>15 5 30 25 25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>SM</td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense, moist, rootlets, no odor, no staining [Colluvium]</td>
<td>5 30 25 40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>SM</td>
<td>Siltstone, yellowish brown (10YR 5/4), weathered, hard, thinly bedded [Chatsworth Formation]</td>
<td></td>
</tr>
</tbody>
</table>

Total Depth = 5.0 ft; refusal on Chatsworth Formation Siltstone.
Collected soil samples S001 at 11:15 and S002 at 11:30.
Backfilled with auger cuttings.
Borehole Diam. (in.): 3  Total Depth (ft): 3.0  Project: SSFL ISRA Sampling - Outfall 008 Area
Northing (ft): 266988.79  Easting (ft): 1796475.35  Job Number: 1891614  Site: Happy Valley South
Drill Start Date: 09-30-2009  Start Time: NR  Logged By: A. Goldenberg  Reviewed By: V. Vathanasin, P.G.
Drill Finish Date: 10-06-2009  Finish Time: NR  Drilling Contractor: Envirosolve  Field Instrumentation: N/A
Depth 1st H₂O (ft): N/A  Date / Time: N/A  Drill Rig Type/Method: Hand Auger
Depth H₂O After Drilling (ft): N/A  Date / Time: N/A  Driller’s Name: A. Goldenberg

Comments: Soil with brush at surface  Well Comp. Date: N/A  Completion Time: N/A
Samplers: Grab sample collected in 6-inch stainless steel sleeve  Soil Backfill Date: 10-06-2009  Backfill Time: 08:55

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Soil Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>0 - 3</td>
<td>SM</td>
<td>s</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), loose to medium dense, dry to moist, roots and rootlets, no odor, no staining [Colluvium]</td>
<td></td>
</tr>
</tbody>
</table>

Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.
Collected soil samples S001 at 12:40 and S002 at 12:50.
Backfilled with auger cuttings.
**Boring ID: HZBS0180**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td>5</td>
<td>20</td>
<td>40</td>
<td>Bare soil at surface</td>
<td>2</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), loose to medium dense, dry to moist, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SM</td>
<td>5</td>
<td>25</td>
<td>35</td>
<td>2</td>
<td>Silty Sand, yellowish brown (10YR 5/6), dense, moist, rootlets, no odor, no staining [Colluvium]</td>
<td></td>
<td></td>
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</tbody>
</table>

- becomes very dense

Sandstone, mottled yellowish brown (10YR 5/4) to very pale brown (10YR 7/3), weathered, hard to very hard, moist [Chatsworth Formation]
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone, mottled yellowish brown (10YR 5/4) to very pale brown (10YR 7/3), weathered, hard to very hard, moist [Chatsworth Formation] (continued)</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 21.2 ft; refusal on Chatsworth Formation Sandstone.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Collected soil samples S001 at 09:30 and S002 at 10:00.</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Backfilled with auger cuttings.</td>
</tr>
</tbody>
</table>
**Boring ID: HZBS0181**

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Job Number:** 1891614  
**Site:** Happy Valley South

**Drill Start Date:** 10-27-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** B. Martasin, P.G.

**Drill Finish Date:** 10-27-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A

**Drill Rig Type/Method:** Hand Auger

**Comments:**

- Bare soil at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Soil samples S001 at 10:30 and S002 at 10:45.
- Backfilled all locations with auger cuttings.

**Easting (ft):** 1796514.61  
**Northing (ft):** 266995.25

**Sample Interval**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td>1</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, roots and rootlets, no odor, no staining [Fill/Slopewash]</td>
<td>10 5 25 20 40</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SM</td>
<td></td>
<td></td>
<td>2</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3) to dark yellowish brown (10YR 4/4), dense, moist, no odor, no staining [Coho]</td>
<td>10 25 20 45</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SM</td>
<td></td>
<td></td>
<td>3</td>
<td>SM</td>
<td>Sandstone, light yellowish brown (10YR 6/4), weathered, hard, friable when augered [Chatsworth Formation]</td>
<td>10 25 20 45</td>
<td></td>
</tr>
</tbody>
</table>

**Total Depth = 3.5 ft at deepest of 8 step-outs within 5-15 ft to S, SW, and SE of GPS location; refusal on Chatsworth Formation Sandstone at each location at depths ranging from 1.3 ft to 3.5 ft.**

**Collected soil samples S001 at 10:30 and S002 at 10:45.**

**Backfilled all locations with auger cuttings.**
<table>
<thead>
<tr>
<th>Depth Level (feet)</th>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, brown (10YR 5/3), loose to dense, dry to moist, gravel- and cobblesize clasts, roots and rootlets, no odor, no staining [Fill/Slopewash]</td>
<td>20 5 20 20 35</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone, hard [Chatsworth Formation]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 1.5 ft; attempted 3 step-outs and met refusal on Chatsworth Formation Sandstone at each location. No sample collected. Backfilled all locations with auger cuttings.</td>
<td></td>
</tr>
</tbody>
</table>
### Boring ID: HZBS0183

<table>
<thead>
<tr>
<th>Sample Interval (ft)</th>
<th>Sample Type</th>
<th>Retained (%)</th>
<th>Recovery (%)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td>Silty Sand, brown (10YR 5/3), loose to dense, moist, roots and rootlets, no odor, no staining [Slopewash/Colluvium]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>1</td>
<td>USCS Soil Classification</td>
<td>Sandstone, grayish brown (10YR 5/2) to brown (10YR 4/3), very weathered, hard, moist, rootlets [Chatsworth Formation]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>2</td>
<td>USCS Soil Classification</td>
<td>Total Depth = 3.5 ft; attempted 3 step-outs to NE and met refusal on Chatsworth Formation at each location. Collected samples S001 at 10:55 and S002 at 11:15. Backfilled all locations with auger cuttings.</td>
<td></td>
</tr>
</tbody>
</table>

### Est. % of Soil

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>30</td>
<td>25</td>
<td>35</td>
</tr>
</tbody>
</table>

**Comments:**
- Bare soil at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Bare soil at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Bare soil at surface
- Grab sample collected in 6-inch stainless steel sleeve

**Log of Boring:**
- Outfall 008 Area
- Happy Valley South

**Project:**
- SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614

**Driller's Name:** A. Goldenberg

**Logging By:** A. Goldenberg

**Reviewed By:** B. Martasin, P.G.

**Drill Rig Type/Method:** Hand Auger

**Date / Time:**
- Start Date: 10-27-2009
- Start Time: NR
- Finish Date: 10-27-2009
- Finish Time: NR

**Depth H2O (ft):** N/A

**Site:**
- Happy Valley South

**Borehole Diam. (in.):** 3

**Total Depth (ft):** 3.5
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, brown (10YR 5/3), medium dense to dense, moist and rootlets, no odor, no staining [Slopewash]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silt/Clay</td>
<td>Siltstone, grayish brown (10YR 5/2), weathered, hard, fractured, moist, rootlets [Chatsworth Formation]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gravel</td>
<td>Total Depth = 3.5 ft; refusal on Chatsworth Formation. Sampled at two step-out locations for soil volume. Collected samples S001 at 13:55 and S002 at 14:20. Backfilled all locations with auger cuttings.</td>
</tr>
</tbody>
</table>
### Log of Boring: Outfall 008 Area

**Boring ID:** HZBS0185  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South

**Drill Start Date:** 10-27-2009  
**Drill Finish Date:** 10-27-2009

**Logged By:** A. Goldenberg  
**Reviewed By:** B. Martasin, P.G.

**Drill Rig Type/Method:** Hand Auger

**Sample Interval:** 0.5 ft  
**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Comments:** Bare soil at surface

**Recovered Sample:** Yes  
**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Field Instrumentation:** N/A

**Envirosolve:** N/A

**Blow Count/6":** N/A

**Gravel Count:** N/A

<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Depth (feet)</th>
<th>Graph Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, roots and rootlets, no odor, no staining [Fill/Slopewash]</td>
</tr>
<tr>
<td>0.5</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3) to dark yellowish brown (10YR 4/4), dense, moist, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>1</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Sandstone, very pale brown (10YR 7/4), hard [Chatsworth Formation]</td>
</tr>
</tbody>
</table>

**Total Depth:** 3.5 ft  
**Total Depth After Drilling:** 3.5 ft

**Soil Backfill Date:** 10-27-2009  
**Backfill Time:** NR

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Sample Type:** Bare soil at surface

**Sample Collectors:** A. Goldenberg

**Sample Description:**

- Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, roots and rootlets, no odor, no staining [Fill/Slopewash]
- Silty Sand, brown (10YR 4/3) to dark yellowish brown (10YR 4/4), dense, moist, no odor, no staining [Colluvium]
- Sandstone, very pale brown (10YR 7/4), hard [Chatsworth Formation]

**Soil Backfill:**

- Collected samples S001 at 12:35 and S002 at 13:00.
- Backfilled both locations with auger cuttings.
**Boring ID:** HZET0100

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-1

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

---

**Borehole Diam. (in.):** 2

**Total Depth (ft):** 3.0

**Easting (ft):** 1795862.76

**Nortthing (ft):** 266767.71

**Date / Time:** 09-21-2009

**Date / Time:** 09-21-2009

**Depth 1st H2O (ft):** N/A

**Depth H2O After Drilling (ft):** N/A

**Start Time:** NR

**Finish Time:** NR

**Drill Rig Type/Method:** Grab (hand sampling)

**Driller’s Name:** Not applicable

**Comments:** Located near roadway; soil with scattered gravel at surface

**Well Comp. Date:** N/A

**Completion Time:** N/A

---

**Sample Interval**

<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Sample Type</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>SM</td>
<td>SM</td>
<td>SM</td>
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</tbody>
</table>

**Description:** Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, roots and rootlets, no odor, no staining [Fill]

[See Trench Log ISRA-HVS-1 for lithology]

**Total Excavation Depth = 3.0 ft.**

Collected soil samples S001, S001-RWQCB, and D001 at 09:25 from excavation sidewall.

Excavation backfilled 12-01-2009.
### Boring ID: HZET0101

#### Project: SSFL ISRA Sampling - Outfall 008 Area

#### Site: Happy Valley South - HVS-1

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#### Details:
- **Log of Boring**: OUTFALL008.GPJ
- **Field Instrumentation**: Envirosolve

#### Sample Log:

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<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
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<tbody>
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<td>Silty Sand with Gravel, dark yellowish brown (10YR 4/4), dense, dry to moist, subangular gravel, no odor, no staining [Fill]</td>
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<tr>
<td>4</td>
<td>S</td>
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<td>Sandstone, weathered [Chatsworth Formation]</td>
<td>becomes less weathered, hard</td>
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</table>

#### Soil Composition:

- **Depth (feet)**: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

#### Comments:
- Soil covered with cut brush at surface
- Grab sample collected in 6-inch stainless steel sleeve

#### Sample Collection:
- Collected samples S001 and S001-RWQCB from excavation sidewall. Hand augered about 1 ft below base of 3-ft-deep excavation and collected sample S002 at 13:10.

#### Additional Details:
- Depth 1st H2O: N/A
- Date / Time: N/A
- Drill Rig Type/Method: Grab (hand sampling) / Hand Auger
- Envirosolve
- Soil Backfill Date: N/A
- Backfill Time: N/A

#### Soil Covered:
- Soil covered with cut brush at surface

#### Soil Samples:
- Grab sample collected in 6-inch stainless steel sleeve

#### Soil Classification:
- **Gravel**: 15
- **Coarse Sand**: 5
- **Med. Sand**: 25
- **Fine Sand**: 20
- **Silt/Clay**: 35
### LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09

#### Comments:
- **Soil covered with cut and mowed brush at surface**
- **Fill** [See Trench Log ISRA-HVS-1 for lithology]
- Silty Sand, yellowish brown (10YR 5/4), dense, dry, roots and rootlets, no odor, no staining [Colluvium]
- Total Depth = 1.3 ft.
- Collected soil sample 001 along with MS/MSD at 12:55 from excavation floor.
- Excavation backfilled 12-01-2009.

#### Sample Interval Retained Sample Type Recovery (%) Blow Count/6” PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification Description Est. % of Soil

<table>
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<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
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<th>Depth (feet)</th>
<th>Graphic Log</th>
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**Boring ID: HZET0103**

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-1

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<th>Water Level</th>
<th>PID (ppm)</th>
<th>Blow Count/6&quot;</th>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
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<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense to dense, dry, subrounded gravel, no odor, no staining [Fill]</td>
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<tr>
<td>4</td>
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<td>Sandstone, weathered [Chatsworth Formation]</td>
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**Comments:** Soil covered with cut and mowed brush at surface

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

<table>
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<tr>
<th>Depth (ft)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Est. % of Soil</th>
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<td>5 10 30 20 35</td>
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</table>

**Total Depth = 4.0 ft.**

Collected sample S001 at 12:45 from excavation sidewall. Hand augered about 1 ft below base of 3-ft-deep excavation and collected sample S002 at 13:25.

Boring ID: HZET0104
Project: SSFL ISRA Sampling - Outfall 008 Area
Site: Happy Valley South - HVS-1

Borehole Diam. (in.): 2
Total Depth (ft): 2.0
Easting (ft): 266778.29
Northing (ft): 1795910.23
Depth 1st H2O (ft): N/A
Depth H2O After Drilling (ft): N/A
Drill Rig Type/Method: Grab (hand sampling)

Soil Backfill Date: 12-01-2009
Backfill Time: N/A
Driller's Name: Not applicable

Comments: Soil with grass and brush at surface
Well Comp. Date: N/A
Completion Time: N/A
Samplers: Grab sample collected in 6-inch stainless steel sleeve

Collected soil sample S001 at 13:20 from excavation sidewall.
Excavation backfilled 12-01-2009.

Fill [See Trench Log ISRA-HVS-1 for lithology]
Silty Sand, dark yellowish brown (10YR 4/6), medium dense to dense, dry to moist, roots, no odor, no staining [Colluvium]

USCS Soil Classification

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</tbody>
</table>

Desired soil composition

Gravel: 5
Coarse Sand: 20
Med. Sand: 35
Fine Sand: 40
Silt/Clay: 0

Total Excavation Depth = 2.0 ft.

Field Instrumentation: N/A
Logging: N/A
Logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
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<th>Depth (feet)</th>
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<th>Est. % of Soil</th>
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<td>Fill [See Trench Log ISRA-HVS-1 for lithology]</td>
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<td>Silty Sand, dark yellowish brown (10YR 4/6), medium dense to dense, dry to moist, roots, no odor, no staining [Colluvium]</td>
<td>5 20 35 40</td>
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<td>Total Excavation Depth = 2.0 ft</td>
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<td>Collected soil sample S001 at 13:35 from excavation sidewall.</td>
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<td>Excavation backfilled 12-01-2009</td>
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<td>Sample Interval (ft)</td>
<td>Sample Type</td>
<td>Recovery (%)</td>
<td>Blow Count/6&quot;</td>
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<td>Depth (feet)</td>
<td>Graphic Log</td>
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<td>Description</td>
<td>Est. % of Soil</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
<td>5 10 25 20 40</td>
</tr>
</tbody>
</table>

Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, fine subrounded gravel up to 1/2 inch diameter, roots and rootlets, no odor, no staining [Colluvium]

Total Depth = 4.0 ft.

Collected soil sample S001 at 09:40 from excavation floor.

Excavation backfilled 12-02-2009.
### Boring ID: HZET0201

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<td>Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, fine subrounded gravel up to 1/2 inch diameter, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Total Depth:** 4.3 ft.

Collected soil sample S001 at 10:00 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring ID: HZET0202**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 4.5
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Northing (ft):** 267156.44
- **Easting (ft):** 1796303.87
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-2A
- **Drill Start Date:** 09-10-2009
- **Start Time:** NR
- **Logged By:** A. Goldenberg
- **Drilling Contractor:** Envirosolve
- **Reviewed By:** V. Vathanasin, P.G.
- **Drill Finish Date:** 09-10-2009
- **Finish Time:** NR
- **Field Instrumentation:** N/A
- **Depth 1st H2O (ft):** N/A
- **Date / Time:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Depth H2O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Driller’s Name:** Not applicable
- **Comments:** Soil covered with mowed grass and brush at surface
- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Samplers:** Grab sample collected in 6-inch stainless steel sleeve
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A

### Sample Interval

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<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
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### USCS Soil Classification

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- **Total Depth = 4.5 ft.**
- **Collected soil sample S001 at 10:45 from excavation floor.**
- **Excavation backfilled 12-02-2009.**
**MWH**

**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
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<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
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</tr>
</tbody>
</table>

**Boring ID: HZET0203**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 5.5
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Northing (ft):** 267138.64
- **Easting (ft):** 1796298.89
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-2A
- **Drill Start Date:** 09-10-2009
- **Start Time:** NR
- **Logged By:** A. Goldenberg
- **Drill Finish Date:** 09-10-2009
- **Finish Time:** NR
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** N/A
- **Depth 1st H,O (ft):** N/A
- **Date / Time:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Depth H2O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Logged By:** N/A
- **Borehole Diam. (in.):** N/A
- **Total Depth (ft):** N/A
- **Driller's Name:** Not applicable

**Comments:** Soil covered with mowed grass and brush at surface

- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Samplers:** Grab sample collected in 6-inch stainless steel sleeve
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A

- **Drilling Contractor:** Envirosolve
- **Envirosolve:

**Excavation backfilled 12-02-2009.**

**Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, fine subrounded gravel up to 1/2 inch diameter, no odor, no staining [Colluvium]**

Total Depth = 5.5 ft.

Collected soil sample S001 at 11:15 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring ID: HZET0204**

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2A

<table>
<thead>
<tr>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, fine subrounded gravel up to 1/2 inch diameter, no odor, no staining [Colluvium]</td>
<td>5 15 25 20 35</td>
</tr>
</tbody>
</table>

Total Depth = 4.8 ft.  
Collected soil sample S001 at 11:20 from excavation floor.  
Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>S</td>
<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
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<td>1</td>
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<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, fine subrounded gravel up to 1/2 inch diameter, no odor, no staining [Colluvium]</td>
</tr>
<tr>
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<td>Total Depth = 5.0 ft.</td>
</tr>
<tr>
<td>3</td>
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<td></td>
<td>Collected soil sample S001 at 12:45 from excavation floor.</td>
</tr>
<tr>
<td>4</td>
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<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A

**Backfill Time:** N/A
Borehole Diam. (in.): 2  Total Depth (ft): 3.8  Project: SSFL ISRA Sampling - Outfall 008 Area
Noting (ft): 267094.50  Easting (ft): 1796301.85  Job Number: 1891614  Site: Happy Valley South - HVS-2A
Drill Start Date: 09-10-2009  Start Time: NR  Logged By: A. Goldenberg  Reviewed By: V. Vathanasin, P.G.
Drill Finish Date: 09-10-2009  Finish Time: NR  Drilling Contractor: Envirosolve  Field Instrumentation: N/A
Depth 1st H2O (ft): N/A  Date / Time: N/A  Drill Rig Type/Method: Grab (hand sampling)
Depth H2O After Drilling (ft): N/A  Date / Time: N/A  Driller's Name: Not applicable
Comments: Soil covered with mowed grass at surface

Sample Interval Retained Sample Type Recovery (%) Blow Count (6") Water Level Depth (feet) Graphic Log

USCS Soil Classification
SM

Description
Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, organic debris (roots, rootlets, and grass fragments), no odor, no staining [Fill]

[See Trench Log ISRA-HVS-2A for lithology]

Depth 1st H
2
O (ft): 4

Drill Start Date: 09-10-2009

Total Excavation Depth = 3.8 ft.

Collected soil sample S001 at 13:00 from excavation sidewall.

Excavation backfilled 12-02-2009.
**Boring ID:** HZET0207

<table>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, fine subrounded gravel up to 1/2 inch diameter, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass at surface

**Sample Interval**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>USCS Soil Classification</th>
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<tbody>
<tr>
<td>0</td>
<td>SM</td>
</tr>
<tr>
<td>4</td>
<td>SM</td>
</tr>
</tbody>
</table>

**Total Depth = 4.0 ft.**

Collected soil sample S001 at 13:10 from excavation floor.

Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blown Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, no odor, no staining [Colluvium]</td>
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<tr>
<td>1</td>
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<td></td>
<td>Total Depth = 3.8 ft.</td>
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<td>2</td>
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<td></td>
<td>Collected soil sample S001 at 13:20 from excavation floor.</td>
</tr>
<tr>
<td>3</td>
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<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

[See Trench Log ISRA-HVS-2A for lithology]
Boring ID: HZET0209

Project: SSFL ISRA Sampling - Outfall 008 Area
Site: Happy Valley South - HVS-2A

Job Number: 1891614
Logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.

Easting (ft): 1790285.57
Start Time: NR
Finish Time: NR
Drill Finish Date: 09-10-2009
Drill Rig Type/Method: Grab (hand sampling)

Depth 1st H2O (ft): N/A
Date / Time: N/A
Driller's Name: Not applicable

Comments: Soil covered with mowed grass and brush at surface

Sample Interval Retained Sample Type Recovery (%) Blow Count/6” PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification

[See Trench Log ISRA-HVS-2A for lithology]

SM Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, fine subrounded gravel up to 1/2 inch diameter, no odor, no staining [Colluvium] 5 10 30 25 30

Total Depth = 4.3 ft.

Collected soil samples S001 and S001SP at 13:30 from excavation floor.

Excavation backfilled 12-02-2009.
**LOG OF BORING OUTFALL008.GPJ**

**BOEING.GDT** 12/16/09

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
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<th>Description</th>
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<td>0</td>
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<td>SM</td>
<td>Silty Sand, dark brown (10YR 3/3), medium dense, moist, subrounded gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
</tbody>
</table>

[See Trench Log ISRA-HVS-2A for lithology]

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>30</td>
</tr>
</tbody>
</table>

**Boring ID: HZET0210**

- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Site:** Happy Valley South - HVS-2A

**Borehole Diam. (in.):** 2
- **Total Depth (ft):** 5.0

**Job Number:** 1891614

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Drill Start Date:** 09-10-2009
- **Start Time:** NR

**Drill Finish Date:** 09-10-2009
- **Finish Time:** NR

**Drilling Contractor:** Envirosolve

**Drill Rig Type/Method:** Grab (hand sampling)

**Depth in H2O (ft):** N/A
- **Date / Time:** N/A

**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H2O After Drilling (ft):** N/A
- **Date / Time:** N/A

**Driller's Name:** Not applicable

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A
- **Completion Time:** N/A

**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A
- **Backfill Time:** N/A

**Total Depth (ft):** 5.0

**Collected soil sample S001 at 13:40 from excavation floor.**

**Excavation backfilled 12-02-2009.**

**Soil Backfill Date:** 12-02-2009
### LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, organic debris (roots), no odor, no staining [Colluvium]</td>
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<td>5</td>
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<th>Est. % of Soil</th>
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<tbody>
<tr>
<td>Gravel</td>
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</tr>
<tr>
<td>Coarse Sand</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Med. Sand</td>
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</tr>
<tr>
<td>Fine Sand</td>
<td></td>
<td></td>
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<tr>
<td>Silty/Clay</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Sample:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A

**Excavation backfilled 12-02-2009.**
**Boring ID: HZET0212**

**MWH**

**Borehole Diam. (in.):** 2

**Total Depth (ft):** 3.3

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266992.65

**Easting (ft):** 1796285.99

**Job Number:** 1891614

**Site:** Happy Valley South - HVS-2A

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Drill Start Date:** 09-10-2009

**Drill Finish Date:** 09-10-2009

**Drill Rig Type/Method:** Grab (hand sampling)

**Drill Rig Contractor:** Envirosolve

**Field Instrumentation:** N/A

**Soil Backfill Date:** 12-02-2009

**Backfill Time:** N/A

**Comments:** Soil covered with brush at surface

**Grab sample collected in 6-inch stainless steel sleeve**

**Total Excavation Depth = 3.3 ft.**

**Collected soil sample S001 at 14:00 from excavation sidewall.**

**Excavation backfilled 12-02-2009.**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark brown (10YR 3/3), density, moist, organic debris (roots), no odor, no staining [Colluvium]</td>
</tr>
</tbody>
</table>

**[See Trench Log ISRA-HVS-2A for lithology]**

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
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<tbody>
<tr>
<td>5</td>
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**Boring ID: HZET0213**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 4.5  
**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A  
**Drill Start Date:** 09-14-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.  
**Drill Finish Date:** 09-14-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A  
**Depth 1st H_2O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)  
**Depth H_2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable

**Comments:** Soil covered with grass and brush at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A  
**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
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<td>–</td>
<td>Silty Sand, dark brown (10YR 3/3) to strong brown (7.5YR 4/6), organic debris (rootlets), pore space possibly due to bioturbation, no odor, no staining [Colluvium]</td>
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<td>Med. Sand</td>
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<td>Fine Sand</td>
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<td></td>
<td>9</td>
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<td>–</td>
<td>Silt/Clay</td>
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</table>

**Total Depth = 4.5 ft.**

Collected soil sample S001 at 12:39 from excavation floor.

Excavation backfilled 12-02-2009.
<table>
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<th>Sample Interval</th>
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<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
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<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A **Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve **Soil Backfill Date:** N/A **Backfill Time:** N/A
Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, subrounded sand, weak to moderate cementation, no odor, no staining [Colluvium]

Total Depth = 4.0 ft.

Collected soil sample S001 at 12:55 from excavation floor.

Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td></td>
<td>SM Silty Sand, dark yellowish brown (10YR 4/4) to yellowish brown (10YR 5/4), dense, moist, roots and rootlets, no odor, no staining [Colluvium]</td>
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<td>Total Depth = 4.0 ft.</td>
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<td>Collected soil sample S001 at 13:07 from excavation floor.</td>
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**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
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Comments: Soil covered with mowed grass and brush at surface
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<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>Silty Sand, yellowish brown (10YR 5/4), dense, moist, subrounded sand, roots and rootlets, no odor, no staining [Colluvium]</td>
<td>5 20 35 40</td>
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- **Log of Boring**: OUTFALL008.GPJ, BOEING.GDT, 12/16/09
- **Site**: Happy Valley South - HVS-2A
- **Well Comp.**: N/A
- **Completion Time**: N/A
- **Sample Types**: Silty Sand, yellowish brown (10YR 5/4), dense, moist, subrounded sand, roots and rootlets, no odor, no staining [Colluvium]
- **Total Depth**: 4.0 ft.
- **Comments**: Soil covered with mowed grass and brush at surface
- **Excavation**: Backfilled 12-02-2009
- **Extraction**: Collected soil sample S001 at 13:28 from excavation floor.
**MWH**

**Boring ID: HZET0218**

- Borehole Diam. (in.): 2
- Total Depth (ft): 4.0
- Project: SSFL ISRA Sampling - Outfall 008 Area

- Northing (ft): 267102.57
- Easting (ft): 1796272.87
- Job Number: 1891614
- Site: Happy Valley South - HVS-2A

- Drill Start Date: 09-14-2009
- Start Time: NR
- Logged By: A. Goldenberg
- Reviewed By: V. Vathanasin, P.G.

- Drill Finish Date: 09-14-2009
- Finish Time: NR
- Drilling Contractor: Envirosolve
- Field Instrumentation: N/A

- Depth 1st H₂O (ft): N/A
- Date/Time: N/A
- Drill Rig Type/Method: Grab (hand sampling)

- Depth H₂O After Drilling (ft): N/A
- Date/Time: N/A
- Driller’s Name: Not applicable

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A
**Backfill Time:** N/A

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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</table>

[See Trench Log ISRA-HVS-2A for lithology]

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<th>Depth (feet)</th>
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</tbody>
</table>

- Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, subrounded sand, roots and rootlets, no odor, no staining [Colluvium]

<table>
<thead>
<tr>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
</tr>
<tr>
<td>Coarse Sand</td>
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<tr>
<td>Med. Sand</td>
</tr>
<tr>
<td>Fine Sand</td>
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<tr>
<td>Silt/Clay</td>
</tr>
</tbody>
</table>

- Total Depth = 4.0 ft.

- Collected soil sample S001 at 13:35 from excavation floor.

- Excavation backfilled 12-02-2009.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
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<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<tr>
<th>Depth (feet)</th>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
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<th>Graphic Log</th>
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<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, subrounded sand, roots and rootlets, no odor, no staining [Colluvium]</td>
<td>10 20 25 45</td>
</tr>
</tbody>
</table>

**Excavation backfilled 12-02-2009.**

**[See Trench Log ISRA-HVS-2A for lithology]**

**Total Depth = 4.0 ft.**

Collected soil samples S001 and S001SP at 13:40 from excavation floor.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
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<th>Sample Interval (feet)</th>
<th>Sample Retained</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>Total Depth = 4.0 ft.</td>
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<td>Collected soil sample S001 at 13:45 from excavation floor.</td>
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<td>Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, no odor, no staining [Colluvium]</td>
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**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
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<tr>
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<td>10</td>
<td>20</td>
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</tbody>
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Comments: Soil covered with mowed grass and brush at surface

Well Comp. Date: N/A  Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: N/A  Backfill Time: N/A

[See Trench Log ISRA-HVS-2A for lithology]
Boring ID: HZET0221

Borehole Diam. (in.): 2
Total Depth (ft): 4.3
Project: SSFL ISRA Sampling - Outfall 008 Area

Northing (ft): 267160.28
Easting (ft): 1796282.94
Job Number: 1891614
Site: Happy Valley South - HVS-2A

Drill Start Date: 09-15-2009
Start Time: NR
Logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.

Drill Finish Date: 09-15-2009
Finish Time: NR
Drilling Contractor: Envirosolve
Field Instrumentation: N/A

Depth 1st H20 (ft): N/A
Date / Time: N/A
Drill Rig Type/Method: Grab (hand sampling)

Depth H2O After Drilling (ft): N/A
Date / Time: N/A
Driller’s Name: Not applicable

Comments: Soil covered with mowed grass and brush at surface
Well Comp. Date: N/A
Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve
Soil Backfill Date: N/A
Backfill Time: N/A

<table>
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<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
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<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, rootlets, no odor, no staining [Colluvium]</td>
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Est. % of Soil

<table>
<thead>
<tr>
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<th>Med. Sand</th>
<th>Fine Sand</th>
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</tr>
</tbody>
</table>

Total Depth = 4.3 ft.
Collected soil sample S001 at 07:50 from excavation floor.
Excavation backfilled 12-02-2009.
Boring ID: HZET0222

Project: SSFL ISRA Sampling - Outfall 008 Area
Site: Happy Valley South - HVS-2A

Job Number: 1891614
Logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.

Easting (ft): 1796283.73
Northing (ft): 267182.23

Drill Start Date: 09-15-2009
Start Time: NR

Drill Finish Date: 09-15-2009
Finish Time: NR

Drill Rig Type/Method: Grab (hand sampling)
Field Instrumentation: N/A

Drill Rig Type/Method: Grab (hand sampling)
Field Instrumentation: N/A

Comments: Soil covered with mowed grass and brush at surface

Sample Interval Retained Recovery Blow Count/6" PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification

0

[See Trench Log ISRA-HVS-2A for lithology]

Depth 1st H2O (ft): N/A
Date / Time: N/A

Depth H2O After Drilling (ft): N/A
Date / Time: N/A

Soil covered with mowed grass and brush at surface

Silty Sand, dark yellowish brown (10YR 4/6), dense to very dense, moist, roots and rootlets, no odor, no staining [Colluvium]

Total Depth = 4.0 ft.

Collected soil sample S001 at 08:05 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring ID: HZET0223**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sampled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 3/4), medium dense, dry to moist, roots and rootlets, no odor, no staining [Colluvium]</td>
<td>5 20 30 45</td>
</tr>
<tr>
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<td></td>
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</tr>
</tbody>
</table>

**Total Depth = 1.5 ft.**

Collected soil sample S001 at 08:15 from excavation floor.

Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval Retained Sample Type Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
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<td>4</td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 3/4), dense, moist, organic debris (rootlets), no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>4</td>
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<td>5</td>
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<td></td>
<td>Total Depth = 4.0 ft.</td>
</tr>
<tr>
<td>5</td>
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<td></td>
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<td>6</td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 08:20 from excavation floor.</td>
</tr>
<tr>
<td>6</td>
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<td>6</td>
<td>7</td>
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<td>Excavation backfilled 12-02-2009.</td>
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**Boring ID: HZET0225**

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<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>0</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), dense to very dense, moist, organic debris (rootlets), no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>4</td>
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<td></td>
<td>Total Depth = 3.8 ft. Collected soil sample S001 at 08:30 from excavation floor. Excavation backfilled 12-02-2009.</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A  **Completion Time:** N/A

**Sampled:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A  **Backfill Time:** N/A

**Not applicable**
Collected soil sample S001 at 08:35 from excavation floor.

Excavation backfilled 12-02-2009.
## Boring ID: HZET0227

<table>
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<th>Sample Interval (feet)</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>Sample</td>
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<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, organic debris (rootlets), no odor, no staining [Colluvium]</td>
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</table>

### Comments
- **Soil covered with mowed grass and brush at surface**
- **Grab sample collected in 6-inch stainless steel sleeve**
- **SM**
- **Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, organic debris (rootlets), no odor, no staining [Colluvium]**

### Total Depth
- **Total Depth = 4.5 ft.**
- Collected soil sample S001 at 09:48 from excavation floor.
- Excavation backfilled 12-02-2009.
**Boring ID: HZET0228**

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614

**Site:** Happy Valley South - HVS-2A

**Drill Start Date:** 09-15-2009

**Drill Finish Date:** 09-15-2009

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Soil Backfill Date:** N/A

**Backfill Time:** N/A

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
<tr>
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<tr>
<td>4</td>
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<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), dense, moist, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>5</td>
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<td></td>
<td></td>
<td>Total Depth = 4.5 ft.</td>
</tr>
</tbody>
</table>

Collected soil sample S001 at 10:00 from excavation floor.

Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
<tr>
<td>1</td>
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<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Sandstone, yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/6),</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>weathered, hard, no odor, no staining [Chatsworth Formation]</td>
</tr>
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<td>2</td>
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<td></td>
<td>Total Depth = 4.0 ft.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Collected sample S001 at 10:10 from excavation floor.</td>
</tr>
<tr>
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<td>3</td>
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<td>Excavation backfilled 12-02-2009.</td>
</tr>
<tr>
<td>4</td>
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</tr>
</tbody>
</table>

**Comments:** Soil covered with mowed grass and brush at surface. 

**Soil covered with mowed grass and brush at surface**

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

**Boring ID:** HZET0229  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A

**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<tbody>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
<tr>
<td>2</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense to dense, dry to moist, subangular to subrounded gravel, roots, no odor, no staining [Colluvium]</td>
<td>5 10 25 20 40</td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td></td>
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<td>3</td>
<td>Total Excavation Depth = 3.3 ft.</td>
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<td>4</td>
<td>Collected soil sample S001 at 10:25 from excavation sidewall.</td>
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<td>Excavation backfilled 12-02-2009.</td>
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</tr>
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</table>

**Comments:** Soil covered with mowed grass and brush at surface

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A  
**Backfill Time:** N/A
### Log of Boring OUTFALL008.GPJ  BOEING.GDT  12/16/09

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 3.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Nothing (ft):** 267193.60  
**Easting (ft):** 1796304.42  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2A  
**Drill Start Date:** 09-29-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.  
**Boring ID:** HZET0231  
**Drill Finish Date:** 09-29-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A  
**Depth 1st H2O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)  
**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller's Name:** Not applicable  
**Comments:** Soil covered with mowed grass at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A  
**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
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<tr>
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<td></td>
<td></td>
<td>SM</td>
<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
</tbody>
</table>

- Silty Sand, dark yellowish brown (10YR 4/4), medium dense to dense, dry to moist, subangular to subrounded gravel, roots and rootlets, no odor, no staining. 
- [Colluvium]

**Total Excavation Depth = 3.0 ft.**

Collected soil sample S001 at 10:15 from excavation sidewall.

Excavation backfilled 12-02-2009.

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
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<td>35</td>
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</table>
### Boring ID: HZET0232

**Borehole Diam. (in.):** 2

**Total Depth (ft):** 2.0

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 267219.49

**Easting (ft):** 1796290.93

**Job Number:** 1891614

**Site:** Happy Valley South - HVS-2A

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Drill Start Date:** 09-29-2009

**Start Time:** NR

**Finish Time:** NR

**Drilling Contractor:** Envirosolve

**Depth 1st H2O (ft):** N/A

**Date / Time:** N/A

**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H2O After Drilling (ft):** N/A

**Date / Time:** N/A

**Comments:** Soil covered with grass at surface

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Sampler:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A

**Backfill Time:** N/A

### Sample Interval

<table>
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<tr>
<th>Depth (feet)</th>
<th>Sample Type</th>
<th>Retained Sample</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>SM</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tr>
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<td></td>
<td>SM</td>
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<td>Silty Sand, dark yellowish brown (10YR 4/4), loose to medium dense, dry, subangular gravel, no odor, no staining [Colluvium]</td>
<td></td>
</tr>
<tr>
<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>Total Excavation Depth = 2.0 ft.</td>
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<td>Collected soil sample S001 at 10:05 from excavation sidewall.</td>
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<td>Excavation backfilled 12-02-2009.</td>
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<th>Sample Interval</th>
<th>Sample Retained</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>SM</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), loose to medium dense, dry, subangular gravel, no odor, no staining [Colluvium]</td>
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<tr>
<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>Collected soil sample S001 at 10:05 from excavation sidewall.</td>
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<td>Excavation backfilled 12-02-2009.</td>
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<tr>
<td>Sample Interval</td>
<td>Sample Type</td>
<td>Recovered (%)</td>
<td>Blow Count/6&quot;</td>
<td>Water Level</td>
<td>Depth (feet)</td>
<td>Graphic Log</td>
<td>USCS Soil Classification</td>
<td>Description</td>
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<td>Silty Sand, dark brown (10YR 3/3), medium dense, dry to moist, roots and rootlets, no odor, no staining [Colluvium]</td>
<td></td>
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</table>

Total Depth = 1.5 ft.

Collected soil sample S001 at 11:10 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring: HZET0234**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 2.8
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Northing (ft):** 267136.07
- **Easting (ft):** 1796242.37
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-2A
- **Drill Start Date:** 09-29-2009
- **Start Time:** NR
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.
- **Drill Finish Date:** 09-29-2009
- **Finish Time:** NR
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Depth 1st H₂O (ft):** N/A
- **Date / Time:** N/A
- **Depth H₂O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Driller's Name:** Not applicable

**Comments:**
- **Soil at surface:**
- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Grab sample collected in 6-inch stainless steel sleeve**
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A
- **Environmental Solvent:**
  - **Sample Interval:**
  - **Depth (feet):**
  - **Water Level:**
  - **Sample Type:**
  - **Sample Retained:**
  - **Recovery (%):**
  - **Blow Count/6”:**
  - **PDI (ppm):**
  - **Depth (feet) Graphic Log:**
  - **USCS Soil Classification:**
  - **Description:** Silty Sand, dark brown (10YR 3/3), medium dense to dense, dry to moist, subangular to subrounded gravel, roots, no odor, no staining [Colluvium]

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PDI (ppm)</th>
<th>Depth (feet) Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>SM</td>
<td>Silty Sand, dark brown (10YR 3/3), medium dense to dense, dry to moist, subangular to subrounded gravel, roots, no odor, no staining [Colluvium]</td>
</tr>
</tbody>
</table>

- **Total Excavation Depth = 2.8 ft.**
- **Collected soil sample S001 at 11:20 from excavation sidewall.**
- **Excavation backfilled 12-02-2009.**
Boring ID: HZET0235

Project: SSFL ISRA Sampling - Outfall 008 Area

Site: Happy Valley South - HVS-2A

Job Number: 1891614

A. Goldenberg

Reviewed By: V. Vathanasin, P.G.

Drill Rig Type/Method: Grab (hand sampling)

Drill Start Date: 09-29-2009

Start Time: NR

Drill Finish Date: 09-29-2009

Finish Time: NR

Drilling Contractor: Envirosolve

Field Instrumentation: N/A

Depth 1st H₂O (ft): N/A

Date / Time: N/A

Depth H₂O After Drilling (ft): N/A

Date / Time: N/A

Driller's Name: Not applicable

Comments: Soil at surface

Well Comp. Date: N/A

Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: N/A

Backfill Time: N/A

Easting (ft): 1796246.64

Northing (ft): 267068.59

Borehole Diam. (in.): 2

Total Depth (ft): 3.8

Happy Valley South - HVS-2A

Envirosolve

SSFL ISRA Sampling - Outfall 008 Area

SM

Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, roots and rootlets, no odor, no staining [Colluvium]

Total Depth = 3.8 ft.

Collected soil sample S001 at 11:00 from excavation floor.

Excavation backfilled 12-02-2009.

[See Trench Log ISRA-HVS-2A for lithology]
**MWH**

**Boring ID: HZET0236**

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<th>Borehole Diam. (in.): 2</th>
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<tr>
<td>Northing (ft): 267033.98</td>
<td>Easting (ft): 1796244.58</td>
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<td>Drill Finish Date: 09-29-2009</td>
<td>Finish Time: NR</td>
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<tr>
<td>Depth 1st H₂O (ft): N/A</td>
<td>Date / Time: N/A</td>
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<tr>
<td>Depth H₂O After Drilling (ft): N/A</td>
<td>Date / Time: N/A</td>
<td>Field Instrumentation: N/A</td>
</tr>
</tbody>
</table>

**Comments:** Located just east of gravel roadway; soil and gravel at surface

**Project:** Happy Valley South - HVS-2A

**Drilling Contractor:** Envirosolve

**Located just east of gravel roadway; soil and gravel at surface**

**Well Comp. Date:** N/A  **Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  **Soil Backfill Date:** N/A  **Backfill Time:** N/A

**Driller's Name:** Not applicable

**Field Instrumentation:** N/A

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

<table>
<thead>
<tr>
<th>Sample Interval Retained Sample Type Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PIP (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>Description</td>
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<td>Graphic Log</td>
<td>USCS Soil Classification</td>
<td>Fill [See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>Graphic Log</td>
<td>USCS Soil Classification</td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense to very dense, moist, rootlets, no odor, no staining [Colluvium]</td>
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<tr>
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<td>Graphic Log</td>
<td>USCS Soil Classification</td>
<td>Total Excavation Depth = 3.0 ft.</td>
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<td>Graphic Log</td>
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<td>Excavation backfilled 12-02-2009.</td>
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**Est. % of Soil**

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<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Sil/Clay</th>
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<tbody>
<tr>
<td>10</td>
<td>25</td>
<td>20</td>
<td>45</td>
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</tr>
</tbody>
</table>

**_log of boring outfall 008 gp / boring gdt 12/16/09**

Sheet 1 of 1
Sandstone, very pale brown (10YR 7/4), moderately weathered, hard, friable with moderate pressure, no odor, no staining [Chatsworth Formation]

Total Depth = 7.0 ft.

Collected soil samples S001 and S001-RWQCB at 13:55 from excavation floor.

Excavation backfilled 12-02-2009.
Grand Canyon, Arizona, United States

[See Trench Log ISRA-HVS-2A for lithology]

Sandstone, yellowish brown (10YR 5/4), moderately weathered, hard, no odor, no staining [Chatsworth Formation]

Total Depth = 6.3 ft.

Collected soil samples S001 and S001-RWQCB at 14:00 from excavation floor.

Excavation backfilled 12-02-2009.
### LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
<td>Silty Sand with Gravel, yellowish brown (10YR 5/4), medium dense, dry to moist, subangular gravel, wood debris, roots and rootlets, no odor, no staining [Fill]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
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<td>[See Trench Log ISRA-HVS-2A for lithology]</td>
</tr>
</tbody>
</table>

**Total Excavation Depth = 5.8 ft.**

Collected soil sample S001 at 14:18 from excavation sidewall.

Excavation backfilled 12-02-2009.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

- **Boring ID:** HZET0240
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Site:** Happy Valley South - HVS-2A
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Counts/6&quot;</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>UCS Soil Classification</th>
<th>PID (ppm)</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
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<td>Sili Sand, yellowish brown (10YR 5/6), dense, moist, roots and rootlets, no odor, no staining [Colluvium]</td>
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- **Easting (ft):** 1798223.81
- **Nordhing (ft):** 267085.85
- **Job Number:** 1891614
- **Drill Start Date:** 10-05-2009
- **Drill Finish Date:** 10-05-2009
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Driller’s Name:** Not applicable
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A
- **Fill soil at surface:** N/A
- **Commets:**
  - Collected soil sample S001 at 14:10 from excavation floor.
  - Excavation backfilled 12-02-2009.

- **Depth 1st H2O (ft):** N/A
- **Date / Time:** N/A
- **Depth H2O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Well Comp. Date:** N/A
- **Completion Time:** N/A

[See Trench Log ISRA-HVS-2A for lithology]
**LOG OF BORING**  
OUTFALL008.GPJ  
BOEING.GDT  
12/16/09

---

**Sample Interval Retained Sample Type Recovery (%) Blow Count/6” PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification Description**

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<th>3</th>
<th>4</th>
<th>SM</th>
<th>Silty Sand, yellowish brown (10YR 5/4), dense, moist, no odor, no staining [Colluvium]</th>
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<tbody>
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<td>Water Level</td>
<td>Retained</td>
<td>Sample Type</td>
<td>Recovery (%)</td>
<td>Blow Count/6”</td>
<td>PID (ppm)</td>
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**Est. % of Soil**

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<tr>
<th>Gravel</th>
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<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>30</td>
<td>25</td>
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**Comments:** Fill soil at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A  
**Sampling:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A  

---

[See Trench Log ISRA-HVS-2A for lithology]

---

Collected soil sample S001 at 14:05 from excavation floor.  
Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot; (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>N/A</td>
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<tr>
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<td>N/A</td>
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<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Fill [See Trench Log ISRA-HVS-2A for lithology]

SM Silty Sand, dark yellowish brown (10YR 3/6), dense, moist, roots and rootlets, no odor, no staining [Colluvium]

Total Excavation Depth = 6.5 ft.

Collected soil sample S001 at 10:10 from excavation sidewall.

Excavation backfilled 12-02-2009.
**LOG OF BORING  OUTFALL 008.GPJ  BOEING.GDT  12/16/09**

**Sample Interval**  | **Retained Sample Type**  | **Recovery (%)**  | **Blow Count/6”**  | **PID (ppm)**  | **Water Level**  | **USCS Soil Classification**  | **Description**  | **Est. % of Soil**  |
---|---|---|---|---|---|---|---|---|
0  | SM  | 10  | 20  | 25  | 45  |  | Silty Sand, brown (10YR 4/3), dense, dry to moist, straw debris [Fill]  |  |
1  | SM  | 15  | 10  | 20  | 25  | 30  | Silty Sand with Gravel, light yellowish brown (10YR 6/4), dense, moist, fine to coarse subrounded sandstone and granitic gravel to 2-1/2 inches diameter, debris observed (rope, asphalt, glass, copper wire) [Fill]  |  |
2  |  |  |  |  |  |  | Total Depth = 4.0 ft.  |  |
3  |  |  |  |  |  |  | Collected soil samples S001, S001-RWQCB, and D001 at 11:50 from excavation floor.  |  |
**Boring ID: HZET0301**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>SM</td>
<td></td>
<td></td>
<td>Silty Sand, brown (10YR 4/3), medium dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td>5 10 20 25 40</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>becomes light yellowish brown (10YR 6/4) to yellowish brown (10YR 5/6), dense, moist, angular to subrounded gravel, decrease in fines, no rootlets</td>
<td>5 10 25 30 30</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 4.0 ft. Collected soil samples S001 and S001-RWQCB at 11:38 from excavation floor. Excavation backfilled 11-23-2009.</td>
<td></td>
</tr>
<tr>
<td>3</td>
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<td></td>
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<td>4</td>
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</tr>
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</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2B-1  
**Job Number:** 1891614  
**Reviewed By:** V. Vathanasin, P.G.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
</tbody>
</table>

[See Trench Log ISRA-HVS-2B-1 for lithology]

Total Excavation Depth = 3.5 ft.

Collected soil samples S001 and S001-RWQC at 09:15 from excavation sidewall.


<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Interval</th>
<th>Water Level (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S</td>
<td>0.0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>S</td>
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<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S</td>
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<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
</tbody>
</table>

**Silty Sand, brown (10YR 4/3), dense, dry to moist, subangular gravel, rootlets, no odor, no staining [Fill]**

**[See Trench Log ISRA-HVS-2B-1 for lithology]**

**Total Excavation Depth = 3.5 ft.**

**Collected soil samples S001 and S001-RWQC at 09:15 from excavation sidewall.**

**Excavation backfilled 11-23-2009.**
## LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/28/09

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 4.5  
**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Northing (ft):** 266926.55  
**Easting (ft):** 1796108.99  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2B-1  
**Drill Start Date:** 09-15-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** S. Valenzuela, P.G.  
**Drill Finish Date:** 09-15-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** PID  
**Depth 1st H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)  
**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable  
**Comments:** Soil with cut brush at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A  
**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A  
**Project:** Happy Valley South - HVS-2B-1

### Sample Interval

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>SM</td>
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<td></td>
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<td>[See Trench Log ISRA-HVS-2B-1 for lithology]</td>
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</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Clay</th>
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<tbody>
<tr>
<td>5</td>
<td>10</td>
<td>25</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

**Comments:**
- Soil with cut brush at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Total Depth = 4.5 ft; terminated on Chatsworth Formation bedrock.
- Collected soil samples S001 and S001-RWQCB at 09:00 from excavation floor.
- Excavation backfilled 11-23-2009.
## Boring ID: HZET0304

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2B-1

### Logs

<table>
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<th>Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tbody>
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<td></td>
<td>0</td>
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<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand with Gravel, very pale brown (10YR 7/4), medium dense, dry to moist, angular to subangular gravel, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
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<tr>
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<td>3</td>
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<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|        | 4        |             |              |               |           |             | 4            |             | Total Excavation Depth = 3.8 ft.  
Collected soil sample S001 at 08:45 from excavation sidewall.  
|        | 5        |             |              |               |           |             | 5            |             |                          |             |
|        | 6        |             |              |               |           |             | 6            |             |                          |             |
|        | 7        |             |              |               |           |             | 7            |             |                          |             |
|        | 8        |             |              |               |           |             | 8            |             |                          |             |
|        | 9        |             |              |               |           |             | 9            |             |                          |             |
|        | 10       |             |              |               |           |             | 10           |             |                          |             |

**Comments:** Soil with grass at surface  
Grab sample collected in 6-inch stainless steel sleeve

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Driller's Name:** Not applicable

**Site:** SSFL ISRASampling - Outfall 008 Area

**Date / Time:** 09-29-2009

**Comments:** Site:

Total Excavation Depth = 3.8 ft.
Collected soil sample S001 at 08:45 from excavation sidewall.
**MWH**

**Boring ID:** HZET0305

**Borehole Diam. (in.):** 2
**Total Depth (ft):** 5.0

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614
**Site:** Happy Valley South - HVS-2B-1

**Drill Start Date:** 09-29-2009
**Start Time:** NR
**Logged By:** A. Goldenberg
**Reviewed By:** V. Vathanasin, P.G.

**Drill Finish Date:** 09-29-2009
**Finish Time:** NR
**Drilling Contractor:** Envirosolve
**Field Instrumentation:** N/A

**Depth 1st H₂O (ft):** N/A
**Date / Time:** N/A
**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H₂O After Drilling (ft):** N/A
**Date / Time:** N/A
**Driller's Name:** Not applicable

**Easting (ft):** 266922.20
**Start Time:** 09-29-2009

**Northing (ft):** 1796100.26
**Finish Time:** 09-29-2009

**Drill Rig Type/Method:** Grab (hand sampling)

**Comments:** Soil at surface

**Soil Backfill Date:** N/A
**Backfill Time:** N/A

**Date / Time:** N/A
**Completion Time:** N/A

**Logged By:** A. Goldenberg
**Reviewed By:** V. Vathanasin, P.G.

**Field Instrumentation:** N/A

---

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), medium dense to dense, moist, concrete debris, rootlets, no odor, no staining [Fill]</td>
<td></td>
</tr>
</tbody>
</table>

**Total Excavation Depth = 5.0 ft.**

Collected soil sample S001 at 08:50 from excavation sidewall.


[See Trench Log ISRA-HVS-2B-1 for lithology]
### LOG OF BORING

**Boring ID:** HZET0500  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

<table>
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<tr>
<th>Borehole Diam. (in.):</th>
<th>Total Depth (ft):</th>
<th>Site:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5.5</td>
<td>Happy Valley South - HVS-2B-2</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Northing (ft):</th>
<th>Easting (ft):</th>
<th>Job Number:</th>
</tr>
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<tbody>
<tr>
<td>266895.75</td>
<td>1796185.37</td>
<td>1891614</td>
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<table>
<thead>
<tr>
<th>Drill Start Date:</th>
<th>Start Time:</th>
<th>Logged By:</th>
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<tbody>
<tr>
<td>09-03-2009</td>
<td>NR</td>
<td>A. Goldenberg</td>
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<table>
<thead>
<tr>
<th>Drill Finish Date:</th>
<th>Finish Time:</th>
<th>Drilling Contractor:</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-03-2009</td>
<td>NR</td>
<td>Envirosolve</td>
</tr>
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<table>
<thead>
<tr>
<th>Field Instrumentation:</th>
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<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth 1st H₂O (ft):</th>
<th>Date / Time:</th>
<th>Drill Rig Type/Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Grab (hand sampling)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth H₂O After Drilling (ft):</th>
<th>Date / Time:</th>
<th>Driller’s Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**Comments:** Rip-rap rock at surface

<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blows Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry to moist, rootlets, no odor, no staining [Fill]</td>
<td>5 5 20 30 40</td>
</tr>
<tr>
<td>1</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand with Gravel, mottled dark yellowish brown (10YR 3/4) to brownish yellow (10YR 6/6), dense, moist, fine to coarse subangular to subrounded gravel to 1-3/4 inches diameter, trace debris observed (wood/carbon), no odor, no staining [Fill]</td>
<td>15 5 25 30 25</td>
</tr>
</tbody>
</table>

**Total Depth = 5.5 ft.**

Collected soil samples S001 and S001-RWQCB at 08:03 from excavation floor.

**Boring ID:** HZET0501

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-2B-2

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silty/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, light yellowish brown (10YR 6/4), loose to medium dense, dry, bioturbation observed, roots and rootlets, no odor, no staining [Fill]</td>
<td></td>
<td>5</td>
<td>15</td>
<td>25</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone [Chatsworth Formation]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Boring ID: HZET0502**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 4.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266884.84  
**Easting (ft):** 1796192.90  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2B-2

**Drill Start Date:** 09-03-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.

**Drill Finish Date:** 09-03-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A

**Depth 1st H2O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller's Name:** Not applicable

**Comments:** Rip-rap at surface

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand</td>
<td>Silty Sand, yellowish brown (10YR 5/4), medium dense, dry to moist, few rootlets, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1</td>
<td>GP</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>GP</td>
<td>Poorly Graded Gravel</td>
<td>Poorly Graded Gravel, subrounded gravel 3/4 inch to 1-1/4 inches diameter, between layers of filter fabric above and below</td>
</tr>
<tr>
<td>2</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>SM</td>
<td>Silty Sand with Gravel</td>
<td>Silty Sand with Gravel, mottled dark yellowish brown (10YR 3/4) to brownish yellow (10YR 6/6), dense, moist, fine to coarse subangular to subrounded gravel to 2 inches diameter, asphalt debris observed, no odor, no staining [Fill]</td>
</tr>
</tbody>
</table>

**Total Depth = 4.0 ft.**

Collected soil samples S001 and duplicate D001 at 09:45 from excavation floor.

LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09

Borehole Diam. (in.): 2
Total Depth (ft): 4.1

Northing (ft): 266882.94
Easting (ft): 1796205.74

Drill Start Date: 09-03-2009
Start Time: NR

Drill Finish Date: 09-03-2009
Finish Time: NR

Depth 1st H2O (ft): N/A
Date / Time: N/A

Depth H2O After Drilling (ft): N/A
Date / Time: N/A

Drill Rig Type/Method: Grab (hand sampling)

Driller's Name: Not applicable

Comments: Soil with grass and dry brush at surface

logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.

Soil Backfill Date: N/A
Backfill Time: N/A

Sample Interval Sample Type Retained Sample Recovery (%) Blow Count/6" PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification

0 SM
1
2
3
4
5
6
7
8
9
10

Est. % of Soil

Gravel
Coarse Sand
Med. Sand
Fine Sand
Silt/Clay

5 5 20 30 40

Description

Silty Sand, yellowish brown (10YR 5/4), medium dense, dry to moist, fine to coarse subrounded gravel to 1-1/2 inches diameter, roots and rootlets, no odor, no staining [Fill]

increase in coarse to medium sand, slight decrease in fine sand and fines

Total Excavation Depth = 4.1 ft.

Collected soil sample S001 at 10:10 from excavation sidewall.

**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, rootlets, no odor, no staining [Fill]</td>
<td>5</td>
<td>5</td>
<td>20</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>GP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GP</td>
<td>Poorly Graded Gravel, subrounded gravel 3/4 inch to 1-1/4 inches diameter, between layers of filter fabric above and below</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, dark yellowish brown (10YR 4/4) to light yellowish brown (10YR 6/4), dense, moist, fine to coarse subangular gravel to 3 inches diameter, asphalt and glass debris observed, no odor, no staining [Fill]</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

**Total Depth = 3.5 ft.**

Collected soil sample S001 at 10:00 from excavation floor.

**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

**Borehole Diam. (in.):** 2  |  **Total Depth (ft):** 6.0  |  **Project:** SSFL ISRA Sampling - Outfall 008 Area
**Northing (ft):** 266880.44  |  **Easting (ft):** 1796170.07  |  **Job Number:** 1891614  |  **Site:** Happy Valley South - HVS-2B-2

**Drill Start Date:** 09-03-2009  |  **Start Time:** NR  |  **Logged By:** A. Goldenberg  |  **Reviewed By:** V. Vathanasin, P.G.
**Drill Finish Date:** 09-03-2009  |  **Finish Time:** NR  |  **Drilling Contractor:** Envirosolve  |  **Field Instrumentation:** N/A

**Depth 1st H₂O (ft):** N/A  |  **Date / Time:** N/A  |  **Drill Rig Type/Method:** Grab (hand sampling)
**Depth H₂O After Drilling (ft):** N/A  |  **Date / Time:** N/A  |  **Driller's Name:** Not applicable

**Comments:** Soil and possible rip-rap at surface  |  **Well Comp. Date:** N/A  |  **Completion Time:** N/A

**Sample Retained**  |  **Sample Type**  |  **Sample Recovery (%)**  |  **Blow Count 6”**  |  **PID (ppm)**  |  **Soil and possible rip-rap at surface**
---|---|---|---|---|---
**Sample Interval**  |  **Sample Type**  |  **Sample Recovery (%)**  |  **Blow Count 6”**  |  **PID (ppm)**  |  **Soil and possible rip-rap at surface**
---|---|---|---|---|---
**Depth 1st H₂O (ft):** 6.0  |  **Sample Type:** SM  |  **Sample Recovery (%)**  |  **Blow Count 6”**  |  **PID (ppm)**  |  **Soil and possible rip-rap at surface**
---|---|---|---|---|---
**Depth H₂O After Drilling (ft):** N/A  |  **Sample Type:** SM  |  **Sample Recovery (%)**  |  **Blow Count 6”**  |  **PID (ppm)**  |  **Soil and possible rip-rap at surface**
---|---|---|---|---|---

**Soil and possible rip-rap at surface**

- *Grab sample collected in 6-inch stainless steel sleeve*
- *Soil Backfill Date: N/A  |  Backfill Time: N/A*

**Sample Interval:**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>SM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry to moist, fine gravel, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>2</td>
<td>Increase in coarse to medium sand, decrease in fine sand and fines, fewer roots and rootlets</td>
</tr>
<tr>
<td>3</td>
<td>Silty Sand with Gravel, mottled dark yellowish brown (10YR 4/4) to brownish yellow (10YR 6/6), dense, moist, subangular gravel, metal debris (pipe) observed, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>6</td>
<td>Total Depth = 6.0 ft.</td>
</tr>
<tr>
<td>6.0</td>
<td>Collected soil sample S001 at 09:50 from excavation floor.</td>
</tr>
<tr>
<td>11-23-2009</td>
<td>Excavation backfilled</td>
</tr>
</tbody>
</table>

*Graphical Log*

- **Sample Type:** SM
- **Sample Recovery (%)**
- **Blow Count 6”**
- **PID (ppm)**

*Field Instrumentation*

- **USCS Soil Classification**
- **Description**

<table>
<thead>
<tr>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
</tr>
<tr>
<td>Coarse Sand</td>
</tr>
<tr>
<td>Med. Sand</td>
</tr>
<tr>
<td>Fine Sand</td>
</tr>
<tr>
<td>Sil/Clay</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>45</td>
</tr>
</tbody>
</table>

*Envirosolve*

**Easting (ft):** 1796170.07  |  **Start Time:** 09-03-2009  |  **Finish Time:** 09-03-2009
**Driller's Name:** Not applicable

**Easting (ft):** 1796170.07  |  **Start Time:** 09-03-2009  |  **Finish Time:** 09-03-2009
**Driller's Name:** Not applicable
## LOG OF BORING - OUTFALL008.GPJ  BOEING.GDT  12/28/09

### Boring ID: HZET0506

<table>
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<th>Description</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>[See Trench Log ISRA-HVS-2B for lithology]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silty Sand with Gravel, mottled dark yellowish brown (10YR 4/4) to brownish yellow (10YR 6/6), dense, moist, subangular gravel, no odor, no staining [Fill]</td>
<td>15</td>
<td>10</td>
<td>25</td>
<td>20</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Depth = 4.1 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collected soil sample S001 at 09:30 from excavation floor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
**Boring ID: HZET0507**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry to moist, subangular to subrounded gravel, rootlets, asphalt debris observed, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, yellowish brown (10YR 5/6), dense, moist, subangular to subrounded gravel, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Total Excavation Depth = 3.8 ft.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>Collected soil sample S001 and MS/MSD at 09:15 from excavation sidewall.</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>8</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** About 2 inches of soil over filter fabric at surface

**Well Comp. Date:** N/A | **Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A | **Backfill Time:** N/A

**Total Excavation Depth = 3.8 ft.**
**Boring ID: HZET0508**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 4.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266911.23  
**Easting (ft):** 1796187.23  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2B-2

**Drill Start Date:** 09-29-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg

**Drill Finish Date:** 09-29-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve

**Depth 1st H2O (ft):** N/A  
**Date / Time:** N/A

**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A

**Driller's Name:** Not applicable

**Comments:** Soil at surface

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Sample Interval Retained Sample Type Recovery (%) Blow Count/6" PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, yellowish brown (10YR 5/6), medium dense to dense, moist, subangular to subrounded gravel, slightly clayey fines, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 4               |                      |              |               |           |             |              |             |                           | Total Excavation Depth = 4.0 ft.  
Collected soil sample S001 at 09:00 from excavation sidewall.  

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>10</td>
<td>20</td>
<td>15</td>
<td>40</td>
</tr>
</tbody>
</table>

[See Trench Log ISRA-HVS-2B for lithology]
Borehole Diam. (in.): 2
Total Depth (ft): 2.3

Project: SSFL ISRA Sampling - Outfall 008 Area

Noting (ft): 266999.09
Easting (ft): 1796003.91

Job Number: 1891614
Site: Happy Valley South - HVS-2C

Drill Start Date: 09-21-2009
Start Time: N/A
Logged By: A. Goldenberg

Drill Finish Date: 09-21-2009
Finish Time: N/A
Logged By: A. Goldenberg

Drilling Contractor: Envirosolve
Field Instrumentation: N/A

Drill Rig Type/Method: Grab (hand sampling)

Comments: Soil with brush at surface

Sample: Grab sample collected in 6-inch stainless steel sleeve

Site: SSFL ISRASampling - Outfall 008 Area

Total Depth = 2.3 ft.

Collected soil samples S001, S001-RWQCB, and D001 at 09:00 from excavation floor.

Excavation backfilled 11-30-2009.

Silty Sand, dark yellowish brown (10YR 4/4), medium dense to dense, dry to moist, subangular gravel, roots and rootlets, no odor, no staining [Fill]

SM

Est. % of Soil

Gravel
Coarse Sand
Med. Sand
Fine Sand
Silt/Clay

10
**Boring ID: HZET0601**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 2.3  
**Easting (ft):** 267000.10  
**Northing (ft):** 267000.10  
**Start Time:** NR  
**Start Time:** NR  
**Finish Time:** NR  
**Finish Time:** NR  
**Drill Start Date:** 09-21-2009  
**Drill Finish Date:** 09-21-2009  
**Depth 1st H2O (ft):** N/A  
**Date / Time:** N/A  
**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable  

**Comments:** Soil with brush at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A  

**Sample Interval**  
**Retained Sample Type**  
**Recovery (%)**  
**Blow Count/6”**  
**PID (ppm)**  
**Water Level (feet)**  
**Depth (feet)**  
**Graphic Log**  
**USCS Soil Classification**  
**Description**  

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>SM</td>
<td>Silty Sand, yellowish brown (10YR 5/4), medium dense to dense, dry to moist, subangular gravel, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>SM</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>SM</td>
<td>SM</td>
<td>2.3 ft.</td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>SM</td>
<td>Collected soil sample S001 at 10:40 from excavation floor.</td>
</tr>
</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2C  
**Job Number:** 1891614  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.  

**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A  

**Depth 1st H2O (ft):** N/A  
**Date / Time:** N/A  
**Depth H2O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable  

**Comments:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A  

**Total Depth = 2.3 ft.**
**Boring ID: HZET0602**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 6.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266999.25  
**Easting (ft):** 1795923.16  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-2C

**Drill Start Date:** 09-21-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg

**Drill Finish Date:** 09-21-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Reviewed By:** V. Vathanasin, P.G.

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller's Name:** Not applicable

**Comments:** Soil with brush at surface

**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Sample Interval Retained**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand with Gravel, light yellowish brown (10YR 6/4), dense, dry, angular to subangular gravel, no odor, no staining [Fill]</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>6</td>
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<td></td>
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</tr>
</tbody>
</table>

**Total Excavation Depth = 6.0 ft.**

Collected soil samples S001 and S001-RWQCB at 09:05 from excavation sidewall.

Excavation backfilled 11-30-2009.
**MWH**

**Boring ID: HZET0603**

<table>
<thead>
<tr>
<th>Borehole Diam. (in.):</th>
<th>Total Depth (ft):</th>
<th>Project:</th>
<th>SSFL ISRA Sampling - Outfall 008 Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.3</td>
<td>Job Number:</td>
<td>1891614</td>
</tr>
<tr>
<td>Northing (ft):</td>
<td>267007.23</td>
<td>Site:</td>
<td>Happy Valley South - HVS-2C</td>
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<tr>
<td>Easting (ft):</td>
<td>1795995.85</td>
<td>Logged By:</td>
<td>A. Goldenberg</td>
</tr>
<tr>
<td>Drill Start Date:</td>
<td>09-21-2009</td>
<td>Reviewed By:</td>
<td>V. Vathanasin, P.G.</td>
</tr>
<tr>
<td>Drill Finish Date:</td>
<td>09-21-2009</td>
<td>Field Instrumentation:</td>
<td>N/A</td>
</tr>
<tr>
<td>Depth 1st H₂O (ft):</td>
<td>N/A</td>
<td>Drill Rig Type/Method:</td>
<td>Grab (hand sampling)</td>
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<tr>
<td>Depth H₂O After Drilling (ft):</td>
<td>N/A</td>
<td>Driller’s Name:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Comments:</td>
<td>Soil with brush at surface</td>
<td>Well Comp. Date:</td>
<td>N/A</td>
</tr>
<tr>
<td>Samplers:</td>
<td>Grab sample collected in 6-inch stainless steel sleeve</td>
<td>Completion Time:</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Depth (ft):</td>
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<td>Samplers:</td>
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<td>Water Level:</td>
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<tr>
<td>USCS Soil Classification:</td>
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<td>N/A:</td>
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<tr>
<td>Description:</td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense, dry to moist, subangular to subrounded gravel, roots and rootlets, no odor, no staining [Fill]</td>
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<tr>
<td>Est. % of Soil:</td>
<td>Gravel:</td>
<td>10</td>
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<tr>
<td></td>
<td>Coarse Sand:</td>
<td>25</td>
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<td>Med. Sand:</td>
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<td>20</td>
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<tr>
<td></td>
<td>Fine Sand:</td>
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<td>25</td>
</tr>
<tr>
<td></td>
<td>Silt/Clay:</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

Total Depth = 2.3 ft.

Collected soil sample S001 at 10:50 from excavation floor.

Excavation backfilled 11-30-2009.
### Job Information

- **Boring ID:** HZET0604
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Site:** Happy Valley South - HVS-2C

### Geographical Details

- **Northing (ft):** 267034.82
- **Easting (ft):** 1795991.66

### Dates

- **Drill Start Date:** 09-21-2009
- **Drill Finish Date:** 09-21-2009

### Depths

- **Depth 1st 
  H2O (ft):** N/A
- **Depth H2O After Drilling (ft):** N/A

### Soil Description

- **Sample Interval:** SM
- **Sample Type:** Grab sample collected in 6-inch stainless steel sleeve
- **USCS Soil Classification:** Silty Sand (10YR 4/4), loose, dry, subangular to subrounded gravel up to 1 inch diameter, roots and rootlets, no odor, no staining [Colluvium]
- **Total Depth:** 0.2 ft.

- **Comments:** Soil with grass and brush at surface

### Backfill

- **Excavation backfilled:** 11-30-2009

### Additional Notes

- **Log of Boring:** OUTFALL008.GPJ, BOEING.GDT, 12/16/09
- **Reviewed By:** V. Vathanasin, P.G.
Boring ID: HZET0605

<table>
<thead>
<tr>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty Sand with Gravel, brownish yellow (10YR 6/6), medium dense, dry to moist, subangular to subrounded gravel, trace cobbles, no odor, no odor, no staining [Colluvium]</td>
<td>20 10 25 15 30</td>
</tr>
<tr>
<td>[See Trench Log ISRA-HVS-2C for lithology]</td>
<td></td>
</tr>
<tr>
<td>Total Excavation Depth = 4.0 ft.</td>
<td></td>
</tr>
<tr>
<td>Collected soil sample S001 at 11:00 from excavation sidewall.</td>
<td></td>
</tr>
<tr>
<td>Excavation backfilled 11-30-2009.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Interval Retained Sample Type Recovery (%) Blow Count/6&quot; PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
</tr>
<tr>
<td>1</td>
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</tr>
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</tbody>
</table>
Boring ID: HZET0700

SSFL ISRA Sampling - Outfall 008 Area

Northing (ft): 266995.25
Easting (ft): 1795599.46
Job Number: 1891614
Site: Happy Valley South - HVS-3

Drill Start Date: 09-24-2009
Start Time: NR
Logged By: A. Goldenberg
Reviewed By: V. Vathanasin, P.G.

Drill Finish Date: 09-24-2009
Finish Time: NR
Drilling Contractor: Envirosolve

Depth 1st H₂O (ft): N/A
Date / Time: N/A
Drill Rig Type/Method: Grab (hand sampling)

Depth H₂O After Drilling (ft): N/A
Date / Time: N/A

Easting (ft):
1795599.46

Soil Backfill Date: N/A
Backfill Time: N/A

Comments: Soil with grass at surface

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: N/A
Backfill Time: N/A

Borehole Diam. (in.): 2
Total Depth (ft): 3.5

Site:
Happy Valley South - HVS-3

Driller's Name: N/A
Field Instrumentation: N/A

Well Comp. Date: N/A
Completion Time: N/A

Total Depth (ft): 3.5

[See Trench Log ISRA-HVS-3 for lithology]

SM
Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, rootlets, no odor, no staining [Colluvium]

5 25 30 40

Total Depth = 3.5 ft.

Collected soil sample S001 at 13:39 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring ID: HZET0701**

**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-3

**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.

**Date / Time:** 09-24-2009  
**Date / Time:** 09-24-2009

**Borehole Diam. (in.):** 2  
**N/A**

**Easting (ft):** 1795566.85  
**N/A**

**Sample Interval**

| Depth (feet) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**Sample Type**

- **SM**

**Water Level**

- **N/A**

**USCS Soil Classification**

- **SM**

**Description**

- Silty Sand, dark brown (10YR 3/3), medium dense, moist, roots and rootlets, no odor, no staining [Colluvium]

- [See Trench Log ISRA-HVS-3 for lithology]

- Total Excavation Depth = 3.3 ft.

- Collected soil sample S001 at 13:34 from excavation sidewall.

- Excavation backfilled 12-02-2009.

**Grab sample collected in 6-inch stainless steel sleeve**

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>5</td>
<td>25</td>
<td>35</td>
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</tbody>
</table>
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
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<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 3/4), medium dense, moist, subangular to subrounded gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>1</td>
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</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Boring ID:** HZET0702

- **Northing (ft):** 266980.37
- **Easting (ft):** 1795576.56
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-3
- **Drill Start Date:** 09-24-2009
- **Start Time:** NR
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Comments:** Soil with grass at surface
- **Sample Type:** Grab sample collected in 6-inch stainless steel sleeve
- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A
- **Total Excavation Depth = 3.5 ft.**

Collected soil sample S001 at 13:42 from excavation sidewall.

Excavation backfilled 12-02-2009.
**MWH**

**Boring ID: HZET0703**

<table>
<thead>
<tr>
<th>Borehole Diam. (in.): 2</th>
<th>Total Depth (ft): 3.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northing (ft): 266986.61</td>
<td>Easting (ft): 1795593.36</td>
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<tr>
<td>Drill Start Date: 09-24-2009</td>
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<td>Drill Finish Date: 09-24-2009</td>
<td>Finish Time: NR</td>
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<tr>
<td>Depth 1st H2O (ft): N/A</td>
<td>Date / Time: N/A</td>
</tr>
<tr>
<td>Depth H2O After Drilling (ft): N/A</td>
<td>Date / Time: N/A</td>
</tr>
</tbody>
</table>

**Comments:** Soil with grass and brush at surface

**Sampels:** Grab sample collected in 6-inch stainless steel sleeve

**Descripton:** [See Trench Log ISRA-HVS-3 for lithology]

- Sandstone, yellowish brown (10YR 5/4-5/6), weathered, very hard, no odor, no staining [Chatsworth Formation]

**Total Excavation Depth = 3.3 ft.**

- Collected soil sample S001 at 13:45 from excavation sidewall.
- Excavation backfilled 12-02-2009.
**Boring ID: HZET0704**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 3.0  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266964.45  
**Easting (ft):** 1795579.43  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-3

**Drill Start Date:** 09-24-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.

**Drill Finish Date:** 09-24-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable

**Comments:** Soil with grass at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

### Sample Interval Retained Sample Type Recovery (%) Blow Count/6” PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification Description

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<tbody>
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<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
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<tr>
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<td>Silty Sand with Gravel, light yellowish brown (10YR 6/4), dense, dry to moist, angular to subrounded gravel and cobbles, roots and rootlets, no odor, no staining [Fill]</td>
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<tr>
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<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
<td></td>
</tr>
</tbody>
</table>
| 3               |          |             |              |               |           |             |              |             | Total Excavation Depth = 3.0 ft.  
Collected soil sample S001 at 13:47 from excavation sidewall.  
Excavation backfilled 12-02-2009. |             |
| 4               |          |             |              |               |           |             |              |             |                          |             |
| 5               |          |             |              |               |           |             |              |             |                          |             |
| 6               |          |             |              |               |           |             |              |             |                          |             |
| 7               |          |             |              |               |           |             |              |             |                          |             |
| 8               |          |             |              |               |           |             |              |             |                          |             |
| 9               |          |             |              |               |           |             |              |             |                          |             |
| 10              |          |             |              |               |           |             |              |             |                          |             |

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
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<td>15</td>
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Borehole Diam. (in.): 2
Total Depth (ft): 4.0

Easting (ft): 1795587.75
Northing (ft): 266970.17

Log Time: 09-24-2009
Logged By: A. Goldenberg

Project: SSFL ISRA Sampling - Outfall 008 Area
Job Number: 1891614
Site: Happy Valley South - HVS-3

Drill Rig Type/Method: Grab (hand sampling)

[See Trench Log ISRA-HVS-3 for lithology]

Silty Sand, dark yellowish brown (10YR 3/6), medium dense, moist, rootlets, no odor, no staining [Colluvium]

Total Depth = 4.0 ft.
Collected soil sample S001 at 13:15 from excavation floor.
Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Retained Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
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<td>2</td>
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<td>3</td>
<td></td>
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<td></td>
<td>3</td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, subangular gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td>Total Depth = 3.8 ft.</td>
</tr>
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<td></td>
<td></td>
<td>Collected soil sample S001 at 11:25 from excavation floor.</td>
</tr>
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<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th></th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty Sand</td>
<td>10</td>
<td>5</td>
<td>25</td>
<td>35</td>
<td>25</td>
</tr>
</tbody>
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**Boring ID: HZET0707**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graph Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td>1</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, light yellowish brown (10YR 6/4) to pale brown (10YR 6/3), medium dense, dry to moist, gravel and cobbles, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Excavation Depth = 3.0 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 11:10 from excavation sidewall.</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Comments:** Soil with grass and brush at surface

**Weight Comp. Date:** N/A  **Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  **Soil Backfill Date:** N/A  **Backfill Time:** N/A

**Est. % of Soil**

<table>
<thead>
<tr>
<th></th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15</td>
<td></td>
<td>25</td>
<td>30</td>
<td>25</td>
</tr>
</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-3

**Job Number:** 1891614

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td>SM</td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 3/6), medium dense to dense, moist, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>SM</td>
<td>Total Depth = 3.3 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>SM</td>
<td>Collected soil sample S001 at 11:05 from excavation floor.</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
<td>4</td>
<td></td>
<td>SM</td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Sil/C</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** Soil with grass at surface

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A

**Backfill Time:** N/A
**Boring ID: HZET0709**

Borehole Diam. (in.): 2
Total Depth (ft): 1.0
Northing (ft): 266983.23
Easting (ft): 1795632.49
Date / Time: Not applicable
Logged By: A. Goldenberg
Drill Site: Happy Valley South - HVS-3
Driller's Name: Not applicable
Drill Rig Type/Method: Grab (hand sampling)

**Comments:** Soil with grass at surface

**Sample Interval**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count 6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 3/4), loose to medium dense, dry, subangular gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 3/4), loose to medium dense, dry, subangular gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
<td></td>
</tr>
</tbody>
</table>

Total Excavation Depth = 1.0 ft.

Collected soil sample S001 at 11:00 from excavation sidewall.

Excavation backfilled 12-02-2009.
### Boring ID: HZET0710

<table>
<thead>
<tr>
<th>Borehole Diam. (in.):</th>
<th>2</th>
<th>Total Depth (ft):</th>
<th>1.5</th>
<th>Project: SSFL ISRA Sampling - Outfall 008 Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northing (ft):</td>
<td>266963.90</td>
<td>Easting (ft):</td>
<td>179553.71</td>
<td>Job Number: 1891614</td>
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<tr>
<td>Drill Start Date:</td>
<td>09-25-2009</td>
<td>Start Time:</td>
<td>07:10</td>
<td>Site: Happy Valley South - HVS-3</td>
</tr>
<tr>
<td>Drill Finish Date:</td>
<td>09-25-2009</td>
<td>Finish Time:</td>
<td>07:18</td>
<td>Logged By: M. Baumgardner</td>
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<tr>
<td>Depth 1st H2O (ft):</td>
<td>N/A</td>
<td>Date / Time:</td>
<td>N/A</td>
<td>Reviewed By: V. Vathanasin, P.G.</td>
</tr>
<tr>
<td>Depth H2O After Drilling (ft):</td>
<td>N/A</td>
<td>Date / Time:</td>
<td>N/A</td>
<td>Drilling Contractor: Envirosolve</td>
</tr>
</tbody>
</table>

**Comments:** Tall grass and weeds up to 2 ft high at surface

**Well Comp. Date:** N/A  **Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve

**Soil Backfill Date:** N/A  **Backfill Time:** N/A

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Interval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, brown (10YR 4/3), loose, dry, no odor, no staining [Alluvium]</td>
<td></td>
<td></td>
<td>35</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Sample Interval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>SP</td>
<td>Poorly Graded Sand, yellowish brown (10YR 5/6), loose to medium dense, dry to moist, angular sandstone fragments, no odor, no staining [Alluvium]</td>
<td></td>
<td>10</td>
<td>30</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

**Total Depth** = 1.5 ft.

Collected soil samples S001, S001SP, and S001-RWQCB at 07:15 from excavation floor.

Excavation backfilled 12-02-2009.
Soil with grass at surface

Grab sample collected in 6-inch stainless steel sleeve

N/A

Envirosolve

Drilling Contractor: N/A

Field Instrumentation: N/A

SSFL ISRASampling - Outfall 008 Area

[See Trench Log ISRA-HVS-3 for lithology]

Sandstone, pale brown (10YR 6/3), weathered, hard, dry, no odor, no staining [Chatsworth Formation]

Total Depth = 3.5 ft.

Collected soil sample S001 at 10:55 from excavation floor.

Excavation backfilled 12-02-2009.
**Boring ID: HZET0712**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>9</td>
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</tr>
</tbody>
</table>

**Depth 1st H₂O (ft):** N/A
**Date / Time:** N/A

**Soil with grass at surface**

**Sampler:** Grab sample collected in 6-inch stainless steel sleeve

**Comments:** [See Trench Log ISRA-HVS-3 for lithology]

- Silty Sand, dark yellowish brown (10YR 4/6), medium dense, moist, rootlets, no odor, no staining [Colluvium]

Total Depth = 3.8 ft.

Collected soil sample S001 at 10:40 from excavation floor.

Excavation backfilled 12-02-2009.

**Est. % of Soil**

- Gravel: 5
- Coarse Sand: 25
- Med. Sand: 25
- Fine Sand: 45
- Silt/Clay: 45
**Boring ID: HZET0713**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 3.5
- **Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-3

**Job Number:** 1891614

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

- **Easting (ft):** 266936.68
- **Northing (ft):** 09-24-2009
- **Start Time:** NR
- **Finish Time:** NR
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Driller's Name:** Not applicable
- **Drill Start Date:** 09-24-2009
- **Drill Finish Date:** 09-24-2009
- **Field Instrumentation:** N/A
- **Total Depth (ft):** 3.5 ft.

**Soil Sample:** Grab sample collected in 6-inch stainless steel sleeve

**Comments:** Soil with grass at surface

**Soil Backfill Date:** N/A

**Backfill Time:** N/A

**Drilling Contractor:** Envirosolve

---

**USCS Soil Classification**

- **SM**
  - Silty Sand, dark yellowish brown (10YR 4/6), medium dense, moist, rootlets, no odor, no staining [Colluvium]
  - **PID (ppm):**
    - **Gravel:** 5
    - **Coarse Sand:** 25
    - **Med. Sand:** 40
    - **Fine Sand:** 30
    - **Silt/Clay:**

**Notes:**

- Total Depth = 3.5 ft.
- Collected soil sample S001 at 10:35 from excavation floor.
- Excavation backfilled 12-02-2009.

---

**Graph Log**

- **Water Level:** Retained
- **Sample Interval:**
  - **Depth (feet):** 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- **Sample Type:**
  - **Sample Retained:**
  - **Sample Recovery (%):**
  - **Blow Count/6”:**
  - **PID (ppm):**
  - **Sample Type:**
  - **Sample Interval:**
  - **Sample Description:**
  - **Sample Recovery (%):**
  - **Blow Count/6”:**
  - **PID (ppm):**
  - **Sample Type:**

---

**Comments:**

[See Trench Log ISRA-HVS-3 for lithology]
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td>0</td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td></td>
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<td>SM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), medium dense, moist, rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>5 25 30 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td>Total Depth = 2.8 ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 09:45 from excavation floor.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>6</td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Comments:** Soil with grass at surface

**Grab sample collected in 6-inch stainless steel sleeve**

**Job Number:** 1891614

**Drill Start Date:** 09-24-2009

**Start Time:** NR

**Drill Finish Date:** 09-24-2009

**Finish Time:** NR

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614

**Site:** Happy Valley South - HVS-3

**Drilling Contractor:** Envirosolve

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Easting (ft):** 266931.79

**Northing (ft):** 1795678.30

**Borehole Diam. (in.):** 2

**Total Depth (ft):** 2.8

**Drill Rig Type/Method:** Grab (hand sampling)

**Depth 1st H₂O (ft):** N/A

**Date / Time:** N/A

**Well Comp. Date:** N/A

**Completion Time:** N/A

**Dates / Times:**
- Start Time: 09-24-2009
- Finish Time: 09-24-2009
- Backfill Time: N/A

**Comments:**
- Soil Backfill Date: N/A
- Backfill Time: N/A
- Easting: 266931.79
- Northing: 1795678.30
- Borehole Diameter: 2 in.
- Total Depth: 2.8 ft.
- Drilling Rig Type: Grab (hand sampling)

**Est. % of Soil:**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Sampler:** Grab sample collected in 6-inch stainless steel sleeve

**Driller’s Name:** Not applicable
### Description

Silty Sand, dark yellowish brown (10YR 4/6), loose to medium dense, dry to moist, rootlets, no odor, no staining [Colluvium]

[See Trench Log ISRA-HVS-3 for lithology]

Total Excavation Depth = 1.3 ft.
Collected soil sample S001 at 13:37 from excavation sidewall.
Excavation backfilled 12-02-2009.

---

### Est. % of Soil

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Sil/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>5</td>
<td>30</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

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### Sample Log

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand</td>
<td></td>
</tr>
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</table>
**Boring ID: HZET0716**

<table>
<thead>
<tr>
<th>Borehole Diam. (in.)</th>
<th>Total Depth (ft)</th>
<th>Project: SSFL ISRA Sampling - Outfall 008 Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.3</td>
<td>Site: Happy Valley South - HVS-3</td>
</tr>
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<table>
<thead>
<tr>
<th>Northing (ft)</th>
<th>Easting (ft)</th>
<th>Job Number: 1891614</th>
</tr>
</thead>
<tbody>
<tr>
<td>267001.19</td>
<td>1795733.50</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>Drill Start Date</th>
<th>Start Time</th>
<th>Logged By: A. Goldenberg</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-24-2009</td>
<td>NR</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Drill Finish Date</th>
<th>Finish Time</th>
<th>Drilling Contractor: Envirosolve</th>
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</thead>
<tbody>
<tr>
<td>09-24-2009</td>
<td>NR</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth 1st H₂O (ft):</th>
<th>Date / Time:</th>
<th>Drill Rig Type/Method: Grab (hand sampling)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth H₂O After Drilling (ft):</th>
<th>Date / Time:</th>
<th>Driller’s Name: Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:** Soil with grass at surface

**Sample Types:** Grab sample collected in 6-inch stainless steel sleeve

**Well Comp. Date: N/A**  **Completion Time: N/A**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/6), loose to medium dense, dry, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Total Excavation Depth = 1.3 ft.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 13:40 from excavation sidewall.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

| Total Excavation Depth: 1.3 ft. |

**Total Depth (ft): 2**

**Soil with grass at surface**

**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Well Comp. Date: N/A**  **Completion Time: N/A**

**Gravel:** 5  **Coarse Sand:** 5  **Med. Sand:** 30  **Fine Sand:** 25  **Silt/Clay:** 35
**LOG OF BORING  OUTFALL008.GPJ  BOEING.GDT  12/16/09**

### Sample Interval

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SP-SM</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>10</td>
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<td></td>
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</tbody>
</table>

### USCS Soil Classification

<table>
<thead>
<tr>
<th>Description</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorly Graded Sand with Silt, brown (10YR 4/3), loose, dry, no odor, no staining [Alluvium]</td>
<td>30</td>
<td>60</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Graded Sand, dark brown (10YR 3/3), medium dense to dense, dry to moist, no odor, no staining [Alluvium]</td>
<td>30</td>
<td>35</td>
<td>30</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Sandstone, very pale brown (10YR 8/3), well indurated but rippable by excavator [Chatsworth Formation]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Excavation Depth = 2.5 ft.

Collected soil samples S001 and S001-RWQCB at 07:25 from excavation sidewall.

Excavation backfilled 12-02-2009.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, dark brown (10YR 3/3), medium dense, moist, minor asphalt debris observed, no odor, no staining [Fill]</td>
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</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>2</td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Excavation Depth = 2.5 ft.
Collected soil sample S001 at 13:15 from excavation sidewall.
Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, brown (10YR 4/3), dense, moist, roots and rootlets, no odor, no staining [Colluvium]</td>
<td></td>
</tr>
<tr>
<td>3</td>
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<td></td>
<td>Total Depth = 2.6 ft.</td>
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<tr>
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<td></td>
<td>Collected soil sample S001 at 13:35 from excavation floor.</td>
<td></td>
</tr>
<tr>
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<td>Excavation backfilled 12-02-2009.</td>
<td></td>
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</tbody>
</table>

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>25</td>
<td>35</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Sample Interval</td>
<td>Sample Type</td>
<td>Retained Recovery (%)</td>
<td>Blow Count/6&quot;</td>
<td>PID (ppm)</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
<td>------------------------</td>
<td>--------------</td>
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</tr>
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</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Total Depth = 3.0 ft.
Collected soil sample S001 at 13:55 from excavation floor.
Excavation backfilled 12-02-2009.
### Description

[See Trench Log ISRA-HVS-3 for lithology]

**Sample Interval**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td>S</td>
<td>Silty Sand, strong brown (7.5YR 4/6) to dark yellowish brown (10YR 4/4), dense, moist, subangular to subrounded gravel, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 3            |             | S                        | Total Depth = 3.0 ft.  
Collect soil sample S001 at 14:05 from excavation floor.  
Excavation backfilled 12-02-2009. |
| 4            |             |                          |             |
| 5            |             |                          |             |
| 6            |             |                          |             |
| 7            |             |                          |             |
| 8            |             |                          |             |
| 9            |             |                          |             |
| 10           |             |                          |             |

### Est. % of Soil

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>25</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>
**Boring ID: HZET0722**

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Job Number:** 1891614

**Site:** Happy Valley South - HVS-3

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Northing:** 266979.90  **Easting:** 1795758.75  **Drill Start Date:** 09-30-2009  **Drill Finish Date:** 09-30-2009

**Start Time:** NR  **Finish Time:** NR  **Drill Rig Type/Method:** Grab (hand sampling)

**Depth H₂O After Drilling (ft):** N/A  **Date / Time:** N/A

**Depth H₂O Before Drilling (ft):** N/A  **Date / Time:** N/A

**Driller's Name:** N/A

**Field Instrumentation:** N/A

**Easting (ft):** 1795758.75  **Start Time:** NR

**Finish Time:** NR  **Date / Time:** N/A

**Job Number:** 1891614  **Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Soil with mowed grass and brush at surface**

**Comments:** Soil with mowed grass and brush at surface

**Sample Interval Retained:** 0

**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Recovery (%):** Grab sample collected in 6-inch stainless steel sleeve

**Blow Count/6”:** N/A

**PID (ppm):** N/A

**Water Level:** Not applicable

**Sample Interval Retained:** 0

**Sample Type:** Grab sample collected in 6-inch stainless steel sleeve

**Recovery (%):** Grab sample collected in 6-inch stainless steel sleeve

**Blow Count/6”:** N/A

**PID (ppm):** N/A

**Water Level:** Not applicable

**Depth (feet):** 0

**USCS Soil Classification:** SM

**Graphic Log:** Silty Sand, strong brown (7.5YR 4/6), dense, moist, rootlets, no odor, no staining [Colluvium]

**Est. % of Soil:**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>20</td>
<td>35</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

**Water Level:** N/A

**Comments:** Total Depth = 3.2 ft.

Collected soil sample S001 at 14:16 from excavation floor.

Excavation backfilled 12-02-2009.

[See Trench Log ISRA-HVS-3 for lithology]
Boring ID: HZET0723

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM Silty Sand, strong brown (7.5YR 4/6), dense, moist, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Total Depth = 3.2 ft.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Collected soil sample S001 at 14:25 from excavation floor.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

Comments: Soil with mowed grass and brush at surface

Well Comp. Date: N/A  Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: N/A  Backfill Time: N/A

Field Instrumentation: N/A

Drill Rig Type/Method: Grab (hand sampling)
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand with Gravel, brown (10YR 4/3) to dark brown (10YR 3/3), medium dense, moist, angular to subrounded gravel and cobbles, unknown odor, no staining [Fill]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Total Excavation Depth = 3.5 ft.</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 13:30 from excavation sidewall.</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Ben Stewart onsite to observe unknown odor and take headspace PID reading (0.0 ppm at background of 0.0 ppm).</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
</tr>
</tbody>
</table>

**Comments:** Excavation in soil and gravel roadway

**Field Instrumentation:** PID

**Drill Rig Type/Method:** Grab (hand sampling)

**Sampler:** Grab sample collected in 6-inch stainless steel sleeve

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-3

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>SM</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry to moist, asphalt and metal debris observed, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
<td></td>
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</tr>
</tbody>
</table>

**Depth:**

- **Depth:** 2.5 ft.

- **Total Excavation Depth:** 2.5 ft.

- **Collected soil sample S001 at 13:25 from excavation sidewall.**

- **Excavation backfilled 12-02-2009.**
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Retained Sample</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
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</tr>
</tbody>
</table>

[See Trench Log ISRA-HVS-3 for lithology]

**SM**
- Silty Sand, dark yellowish brown (10YR 3/4) to dark brown (10YR 3/3), medium dense, moist, rootlets, no odor, no staining [Colluvium]

Total Depth = 6.0 ft.

- Collected soil samples S001 and S001-RWQCB at 08:55 from excavation floor.
- Excavation backfilled 12-02-2009.
**Boring ID: HZET0727**

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>[See Trench Log ISRA-HVS-3 for lithology]</td>
</tr>
</tbody>
</table>

**Comments:**

- Bare soil at surface
- Grab sample collected in 6-inch stainless steel sleeve
- Soil Backfill Date: N/A
- Backfill Time: N/A

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Comments:**

- Total Excavation Depth = 6.0 ft.
- Collected soil samples S001 and S001-RWQB at 09:05 from excavation sidewall.
- Excavation backfilled 12-02-2009.
**MWH**

**Boring ID: HZET0728**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft.):** 1.2
- **Project:** SSFL ISRA Sampling - Outfall 008 Area

**Drill Rig Type/Method:** Grab (hand sampling)

**Comments:** Adjacent to metal pipe, bare soil at surface

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, brown (10YR 4/3) to dark yellowish brown (10YR 4/4), loose to dense, moist, angular sandstone gravel, debris observed (ceramic and metal pipe), no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone, very hard [Chatsworth Formation]</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Depth = 1.2 ft.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 10:50 from excavation floor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Excavation backfilled 12-02-2009.</td>
<td></td>
</tr>
</tbody>
</table>

**Well Comp. Date:** N/A
**Completion Time:** N/A
**Soil Backfill Date:** N/A
**Backfill Time:** N/A

**Borehole Diam. (in.):** 2
**Total Depth (ft.):** 1.2

**Easting (ft):** 266922.95
**Northing (ft):** 1795731.56
**Drill Start Date:** 10-29-2009
**Start Time:** 10:50
**Logged By:** A. Goldenberg
**Job Number:** 1891614
**Reviewed By:** B. Martasin, P.G.
**Site:** Happy Valley South - HVS-3

**Drill Rig Type/Method:** Grab (hand sampling)

**Depth 1st H₂O (ft):** N/A
**Date / Time:** N/A

**Depth H₂O After Drilling (ft):** N/A
**Date / Time:** N/A

**Driller’s Name:** Not applicable
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand with Gravel, brown (10YR 4/3) to dark yellowish brown (10YR 4/4), loose to medium dense, moist, subangular sandstone gravel, subrounded to rounded fill gravel, no odor, no staining [Fill]</td>
<td>15 5 25 20 35</td>
</tr>
<tr>
<td>1.0</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Sandstone, very hard [Chatsworth Formation]</td>
<td></td>
</tr>
</tbody>
</table>

**Boring ID: HZET0729**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 1.7
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Nothing (ft):** 266926.06
- **Easting (ft):** 1795732.12
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-3
- **Drill Start Date:** 10-29-2009
- **Start Time:** 11:05
- **Logged By:** A. Goldenberg
- **Reviewed By:** B. Martasin, P.G.
- **Drill Finish Date:** 10-29-2009
- **Finish Time:** 11:10
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** PID
- **Depth 1st H₂O (ft):** N/A
- **Date / Time:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Depth H₂O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Driller’s Name:** Not applicable
- **Comments:** Adjacent to metal pipe, bare soil at surface
- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Samplers:** Grab sample collected in 6-inch stainless steel sleeve
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A

**Excavation backfilled 12-02-2009.**
**Boring ID: HZET0730**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 9.5
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Job Number:** 1891614
- **Site:** Happy Valley South - HVS-3
- **Drill Start Date:** 10-29-2009
- **Start Time:** 11:20
- **Logged By:** A. Goldenberg
- **Reviewed By:** B. Martasin, P.G.
- **Drill Finish Date:** 10-29-2009
- **Finish Time:** 11:25
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** PID

**Comments:**
- **Former tank location**
- **Well Comp. Date:** N/A
- **Completion Time:** N/A

**Sample Interval**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>UCS Soil Classification</th>
<th>USCS Soil Classification</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>20.0</td>
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</tr>
</tbody>
</table>

- **Former tank**
- **Gravel and cobbles 2 to 4 inches diameter** [Fill]
- **Sandstone, very pale brown (10YR 7/4) to yellow (10YR 7/6), very hard, well indurated, massive** [Chatsworth Formation]
- **Total Depth = 9.5 ft.**
- **Collected soil samples S001 and S001-RWQCB at 11:25 from excavation floor.**
- **Collected two additional sleeves at 12:46 on 11-02-09 (HZET0730AS001).**
- **Excavation backfilled 12-02-2009.**
Driller’s Name: N/A
Project: SSFL ISRA Sampling - Outfall 008 Area

Not applicable
Bare soil at surface
Grab sample collected in 6-inch stainless steel sleeve
Fill [See Trench Log ISRA-HVS-3 for lithology]

Drill Rig Type/Method: Grab (hand sampling)

266923.94
1795728.72
10-29-2009
11:45
Drilling Contractor: Envirosolve
Field Instrumentation: PID

Depth 1st H₂O (ft): N/A
Date / Time: N/A

Drill Start Date: 10-29-2009
Start Time: 11:40
Logged By: A. Goldenberg
Reviewed By: B. Martasin, P.G.

Total Excavation Depth = 9.0 ft.

Collected soil sample S001 at 11:45 from excavation sidewall.
Excavation backfilled 12-02-2009.
<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
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<td>0</td>
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<td>[See Trench Log ISRA-HVS-4 for lithology]</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>SM</td>
<td></td>
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<td>4</td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, rootlets, no odor, no staining [Colluvium]</td>
<td>5 30 25 40</td>
</tr>
<tr>
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<td></td>
<td>5</td>
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</tr>
</tbody>
</table>

Total Depth = 5.0 ft.

Collected soil sample S001 at 10:10 from excavation floor.

Excavation backfilled 11-24-2009.
**MWH**

**Boring ID: HZET0801**

**Borehole Diam. (in.):** 2  
**Total Depth (ft):** 4.5  
**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Northing (ft):** 266891.12  
**Easting (ft):** 1795637.56  
**Job Number:** 1891614  
**Site:** Happy Valley South - HVS-4

**Drill Start Date:** 09-23-2009  
**Start Time:** NR  
**Logged By:** A. Goldenberg  
**Reviewed By:** V. Vathanasin, P.G.

**Drill Finish Date:** 09-23-2009  
**Finish Time:** NR  
**Drilling Contractor:** Envirosolve  
**Field Instrumentation:** N/A

**Depth 1st H₂O (ft):** N/A  
**Date / Time:** N/A  
**Drill Rig Type/Method:** Grab (hand sampling)

**Depth H₂O After Drilling (ft):** N/A  
**Date / Time:** N/A  
**Driller’s Name:** Not applicable

**Comments:** Bare soil at surface  
**Well Comp. Date:** N/A  
**Completion Time:** N/A

**Samplers:** Grab sample collected in 6-inch stainless steel sleeve  
**Soil Backfill Date:** N/A  
**Backfill Time:** N/A

---

**Sample Interval**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Retained</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
<td>[See Trench Log ISRA-HVS-4 for lithology]</td>
</tr>
</tbody>
</table>

| 0 | | | | | | | | | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

---

**SM**  
Silty Sand, dark yellowish brown (10YR 4/4), dense, moist, rootlets, no odor, no staining [Colluvium]

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silty/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>30</td>
<td>25</td>
<td>35</td>
</tr>
</tbody>
</table>

- Total Depth = 4.5 ft.
- Collected soil sample S001 at 10:40 from excavation floor.
- Excavation backfilled 11-24-2009.
<table>
<thead>
<tr>
<th>Sample Interval Retained Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Est. % of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td></td>
<td></td>
<td></td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), dense, dry, subangular gravel, roots, no odor, no staining [Colluvium]</td>
<td>10 10 30 20 30</td>
<td></td>
</tr>
</tbody>
</table>

Total Depth = 4.3 ft.

Collected soil samples S001 and S001-RWQCB at 09:10 from excavation floor.

Excavation backfilled 11-24-2009.

[See Trench Log ISRA-HVS-4 for lithology]
Boring ID: HZET0803

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
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<td>0</td>
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<td></td>
<td>[See Trench Log ISRA-HVS-4 for lithology]</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense, dry, roots and rootlets, no odor, no staining [Colluvium]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Total Depth = 4.5 ft.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>Collected soil sample S001 at 10:50 from excavation floor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td>Excavation backfilled 11-24-2009.</td>
</tr>
</tbody>
</table>

Total Depth: 4.5 ft.

Comments: Soil with loose asphalt debris at surface

Well Comp. Date: N/A
Completion Time: N/A

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Soil Backfill Date: N/A
Backfill Time: N/A

Est. % of Soil

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

**Boring ID: HZET0804**

**Borehole Diam. (in.): 2**  **Total Depth (ft): 3.8**

**Notching (ft): 266895.85**  **Easting (ft): 1795610.47**

**Drill Start Date: 09-23-2009**  **Start Time: NR**

**Logged By: A. Goldenberg**  **Reviewed By: V. Vathanasin, P.G.**

**Drill Finish Date: 09-23-2009**  **Finish Time: NR**

**Drilling Contractor: Envirosolve**  **Field Instrumentation: N/A**

**Depth 1st H₂O (ft): N/A**  **Date / Time: N/A**

**Drill Rig Type/Method: Grab (hand sampling)**

**Depth H₂O After Drilling (ft): N/A**  **Date / Time: N/A**

**Driller’s Name: Not applicable**

**Comments: Asphalt 3 inches thick at surface, no road base**

**Well Comp. Date: N/A**  **Completion Time: N/A**

**Sample Type: Grab sample collected in 6-inch stainless steel sleeve**  **Soil Backfill Date: N/A**  **Backfill Time: N/A**

**Sample Interval Retained (%)**

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>SM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**Water Level**

- Total Excavation Depth = 3.8 ft.
- Collected soil sample S001 at 10:40 from excavation sidewall.
- Excavation backfilled 11-24-2009.

**Graph Log**

<table>
<thead>
<tr>
<th>PID (ppm)</th>
<th>Blow Count/6&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**USCS Soil Classification**

- Silty Sand with Gravel, yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/4), dense, dry, roots and rootlets, no odor, no staining [Fill]

[See Trench Log ISRA-HVS-4 for lithology]

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>SIh/Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>10</td>
<td>25</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-4

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-4
Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, subangular gravel, roots and rootlets, asphalt and metal (wire) debris observed, no odor, no staining [Fill]

[See Trench Log ISRA-HVS-4 for lithology]

Total Excavation Depth = 4.8 ft.

Collected soil samples S001 and duplicate D001 at 10:25 from excavation sidewall.

Excavation backfilled 11-24-2009.
**LOG OF BORING OUTFALL008.GPJ  BOEING.GDT  12/16/09**

**Boring ID: HZET0806**

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 4.0
- **Project:** SSFL ISRA Sampling - Outfall 008 Area
- **Northing (ft):** 266890.84
- **Easting (ft):** 1795655.64
- **Job Number:** 1891614
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.
- **Site:** Happy Valley South - HVS-4
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.
- **Drill Start Date:** 09-23-2009
- **Start Time:** NR
- **Logged By:** A. Goldenberg
- **Reviewed By:** V. Vathanasin, P.G.
- **Drill Finish Date:** 09-23-2009
- **Finish Time:** NR
- **Drilling Contractor:** Envirosolve
- **Field Instrumentation:** N/A
- **Depth 1st H2O (ft):** N/A
- **Date / Time:** N/A
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Depth H2O After Drilling (ft):** N/A
- **Date / Time:** N/A
- **Driller's Name:** Not applicable

**Comments:**
- Soil with brush at surface
- Soil with brush at surface
- Soil with brush at surface

**Sample Interval Retained:**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
</tbody>
</table>

---

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>30</td>
<td>25</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

---

**Comments:**
- Total Excavation Depth = 4.0 ft.
- Collected soil samples S001 and S001-RWQCB at 09:20 from excavation sidewall.
- Excavation backfilled 11-24-2009.

**Job Number:** 1891614

**Logged By:** A. Goldenberg

**Reviewed By:** V. Vathanasin, P.G.

**Easting (ft):** 1795655.64

**Date / Time:** N/A

---

**Comments:**
- Soil with brush at surface
- Soil with brush at surface
- Soil with brush at surface

**Sample Interval Retained:**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, roots and rootlets, no odor, no staining [Fill]</td>
</tr>
</tbody>
</table>

---

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>30</td>
<td>25</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

---

**Comments:**
- Total Excavation Depth = 4.0 ft.
- Collected soil samples S001 and S001-RWQCB at 09:20 from excavation sidewall.
- Excavation backfilled 11-24-2009.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Depth Level (feet)</th>
<th>USCS Soil Classification</th>
<th>Description</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silts/Clays</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td>Silty Sand with Gravel, dark yellowish brown (10YR 4/6), medium dense to dense, dry to moist, subangular gravel, no odor, no staining [Fill]</td>
<td></td>
<td>15</td>
<td>5</td>
<td>25</td>
<td>30</td>
<td>25</td>
</tr>
</tbody>
</table>

Total Excavation Depth = 3.5 ft.

Collected soil sample S001 at 08:00 from excavation sidewall.

Excavation backfilled 11-24-2009.
Drill Rig Type/Method: Grab (hand sampling)

Date / Time: 08-26-2009

PID

Easting (ft): 2795444.02

File Instrumentation: N/A

Logged By: A. Goldenberg

Reviewed By: S. Valenzuela, P.G.

Depth 1st H2O (ft): N/A

Drill Type: N/A

Comments: Soil with brush, old hydromulch at surface

Sample Interval Retained Sample Type Recovery (%) Blow Count/6" PID (ppm) Water Level Depth (feet) Graphic Log USCS Soil Classification Description

<table>
<thead>
<tr>
<th>Depth</th>
<th>SM</th>
<th>Silty Sand, dark yellowish brown (10YR 4/4), loose to medium dense, dry, angular to subangular gravel, roots and rootlets, bioturbation observed, no odor, no staining [Alluvium]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1.0</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2.0</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>3.0</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>4.0</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sandy, light yellowish brown (10YR 6/4), weathered, hard, dry [Chatsworth Formation]

Total Depth = 3.0 ft.

Collected soil sample S001 at 14:55 from excavation floor in ISRA Area DRG-1.

<table>
<thead>
<tr>
<th>Sample Interval Retained Sample Type Recovery (%) Blow Count (6&quot;) PID (ppm) Water Level USCS Soil Classification</th>
<th>Description</th>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>SM</td>
<td>Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, roots and rootlets, no odor, no staining [Alluvium]</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td>0</td>
<td>SM</td>
<td>Sandstone, light yellowish brown (10YR 6/4), weathered, hard, dry, fine-grained, thinly bedded, fractured [Chatsworth Formation]</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Total Excavation Depth = 2.5 ft.

Collected soil sample S001 at 15:30 from excavation sidewall in ISRA Area DRG-1.

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>ML/SM</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td>2.5</td>
<td>Sandy Silt / Silty Sand, dark yellowish brown (10YR 4/4), loose to medium dense, dry, angular to subangular sandstone gravel, roots and rootlets, bioturbation observed, no odor, no staining [Alluvium]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandstone, light yellowish brown (10YR 6/4), weathered, very hard, dry, fine-grained, fractured; roots and rootlets at upper contact [Chatsworth Formation]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Excavation Depth = 2.5 ft.

Collected soil sample S001 and MS/MSD at 14:25 from excavation sidewall in ISRA Area DRG-1.

**Boring ID: HZET0903**

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - DRG-1

**Job Number:** 1891614

**Logged By:** A. Goldenberg

**Reviewed By:** S. Valenzuela, P.G.

**Borehole Diam. (in.):** 2

**Total Depth (ft):** 3.5

**Northing (ft):** 265879.73

**Easting (ft):** 1795426.86

**Drill Start Date:** 08-26-2009

**Start Time:** NR

**Drill Finish Date:** 08-26-2009

**Finish Time:** NR

**Drilling Contractor:** Envirosolve

**Field Instrumentation:** PID

**Drill Rig Type/Method:** Grab (hand sampling)

**Comments:** Soil with brush, old hydromulch at surface

### Sample Log

<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6”</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Depth (feet)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML</td>
<td>0</td>
<td>Sandy Silt, dark yellowish brown (10YR 4/4), loose to medium dense, dry, angular to subangular sandstone gravel, roots and rootlets, bioturbation observed, no odor, no staining [Alluvium]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML</td>
<td>2</td>
<td>Sandstone, yellowish brown (10YR 5/6) to light yellowish brown (10YR 6/4), slightly weathered, hard, dry, fine-grained, fractured [Chatsworth Formation]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ML</td>
<td>3</td>
<td>becomes less fractured</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Depth = 3.5 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collected sample S001 at 14:40 from excavation floor from ISRA Area DRG-1.</td>
</tr>
</tbody>
</table>

**Beg. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>40</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

**Site:** Happy Valley South - DRG-1

**Logged By:** A. Goldenberg

**Reviewed By:** S. Valenzuela, P.G.

**Drill Rig Type/Method:** Grab (hand sampling)
<table>
<thead>
<tr>
<th>Sample Interval (ft)</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td>0.0</td>
<td>5</td>
<td>ML/SM</td>
<td>0</td>
<td>0</td>
<td></td>
<td>Sandy Silt / Silty Sand, dark yellowish brown (10YR 4/4), medium dense, dry, subangular sandstone gravel, roots and rootlets, bioturbation observed, no odor, no staining [Alluvium]</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>Sandstone, yellowish brown (10YR 5/4) to light yellowish brown (10YR 6/4), weathered, hard, dry, fine-grained [Chatsworth Formation]</td>
<td>100</td>
</tr>
<tr>
<td>Sample Interval Retained</td>
<td>Sample Type</td>
<td>Recovery (%)</td>
<td>Blow Count/6&quot;</td>
<td>PID (ppm)</td>
<td>Water Level</td>
<td>Depth (feet)</td>
<td>Graphic Log</td>
<td>USCS Soil Classification</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------</td>
<td>--------------</td>
<td>---------------</td>
<td>-----------</td>
<td>-------------</td>
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<td>-------------</td>
<td>------------------------</td>
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</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty Sand with Gravel, light yellowish brown (10YR 6/4), dense, dry to moist, angular to subangular gravel and cobbles, rootlets, white hair-like fibers, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>Total Depth = 1.5 ft.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collected soil samples S001 and S001-RWQCB at 10:30 from excavation floor.</td>
</tr>
</tbody>
</table>

**Comments:** Located in unpaved road

- **Well Comp. Date:** N/A
- **Completion Time:** N/A
- **Samplers:** Grab sample collected in 6-inch stainless steel sleeve
- **Soil Backfill Date:** N/A
- **Backfill Time:** N/A

**Est. % of Soil**

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>5</td>
<td>20</td>
<td>25</td>
<td>35</td>
</tr>
</tbody>
</table>

**Project:** SSFL ISRA Sampling - Outfall 008 Area

**Site:** Happy Valley South - HVS-2D

**Boring ID:** HZET1000

- **Borehole Diam. (in.):** 2
- **Total Depth (ft):** 1.5
- **Job Number:** 1891614
- **Easting (ft):** 267129.57
- **Northing (ft):** 1796214.61
- **Drill Start Date:** 10-05-2009
- **Drill Finish Date:** 10-06-2009
- **Logged By:** A. Goldenberg
- **Drilled Contractor:** Envirosolve
- **Drill Rig Type/Method:** Grab (hand sampling)
- **Driller’s Name:** Not applicable
<table>
<thead>
<tr>
<th>Sample Interval</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>SM</td>
<td>90</td>
<td>100</td>
<td>3</td>
<td>2</td>
<td></td>
<td>Silty Sand with Gravel, light yellowish brown (10YR 6/4), dense, dry to moist, angular to subangular gravel and cobbles, rootlets, white hair-like fibers, no odor, no staining [Fill]</td>
<td></td>
</tr>
</tbody>
</table>

Total Depth = 2.0 ft.

Collected soil samples S001 and S001-RWQCB at 10:35 and S002 and S002-RWQCB at 10:38 from excavation floor.


Est. % of Soil

<table>
<thead>
<tr>
<th>Gravel</th>
<th>Coarse Sand</th>
<th>Med. Sand</th>
<th>Fine Sand</th>
<th>Silt/Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>5</td>
<td>20</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>
## Boring Log

**Boring ID:** HZET1002  
**Project:** SSFL ISRA Sampling - Outfall 008 Area  
**Site:** Happy Valley South - HVS-2D

### Site Information
- **Job Number:** 1891614
- **Easting (ft):** 267141.84
- **Northing (ft):** 1796216.37
- **Drill Start Date:** 10-19-2009
- **Drill Finish Date:** 10-19-2009
- **Start Time:** NR
- **Finish Time:** NR
- **Drill Rig Type/Method:** Grab (hand sampling)

### Soils Description
- **Depth 1st H₂O (ft):** N/A  
- **Date / Time:** N/A
- **Depth H₂O After Drilling (ft):** N/A  
- **Date / Time:** N/A

### Soil Types
- **SM:** Silty Sand, yellowish brown (10YR 5/4), dense to very dense, dry to moist, rootlets, white hair-like fibers, no odor, no staining [Fill]

### Sample Interval

<table>
<thead>
<tr>
<th>Sample Interval Retained</th>
<th>Sample Type</th>
<th>Recovery (%)</th>
<th>Blow Count/6&quot;</th>
<th>PID (ppm)</th>
<th>Water Level</th>
<th>Depth (feet)</th>
<th>Graphic Log</th>
<th>USCS Soil Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>SM</td>
<td>SM</td>
<td>Silty Sand, yellowish brown (10YR 5/4), dense to very dense, dry to moist, rootlets, white hair-like fibers, no odor, no staining [Fill]</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Total Depth = 2.0 ft.</td>
</tr>
</tbody>
</table>

### Additional Notes
- Collected soil samples S001 and S001-RWQCB at 10:00 from excavation floor.
- Excavation backfilled 11-23-2009.
Borehole Diam. (in.): 2
Total Depth (ft): 1.5
Project: SSFL ISRA Sampling - Outfall 008 Area

Northing (ft): 267006.68
Easting (ft): 1796201.65
Job Number: 1891614
Site: Happy Valley South - HVS-2D

Drill Start Date: 10-19-2009
Start Time: NR
Logged By: A. Goldenberg

Drill Finish Date: 10-19-2009
Finish Time: NR
Drilling Contractor: Envirosolve

Depth 1st H2O (ft): N/A
Date / Time: N/A
Drill Rig Type/Method: Grab (hand sampling)

Depth H2O After Drilling (ft): N/A
Date / Time: N/A
Driller’s Name: Not applicable

Comments: Fill soil at surface

Samplers: Grab sample collected in 6-inch stainless steel sleeve

Well Comp. Date: N/A
Completion Time: N/A
Soil Backfill Date: N/A
Backfill Time: N/A

[See Trench Log ISRA-HVS-2D for lithology]

Sandstone, pale brown (10YR 6/3) to light yellowish brown (10YR 6/4), weathered, hard, medium- to fine-grained, no odor, no staining

[Chatsworth Formation]

Total Excavation Depth = 1.5 ft.

Collected soil samples S001 and S001-RWQCB at 12:05 from excavation sidewall.