

## 6.0 REFERENCES

- Agency for Toxic Substances and Disease Registry, ToxFAQs™ Website, [www.atsdr.cdc.gov/toxfaq.html](http://www.atsdr.cdc.gov/toxfaq.html).
- Brewer Environmental Services; *Further Phase II Site Characterization Report, Dole Packaged Foods Company, Emulsion Plant Facility*; July 13, 1993.
- EnviroServices & Training Center, LLC; *Soil Sampling Report, Former Emulsion Plant*; April 16, 2003.
- Macdonald, G.A., A.T. Abbot, and F.L. Peterson, "Volcanoes and the Sea." University of Hawaii Press, 1983.
- Mink, John F. and Stephen L. Lau, "Aquifer Identification and Classification for Lanai: Groundwater Protection Strategy for Hawaii." April 1993.
- State of Hawaii Department of Health, Underground Storage Tank Program, "Technical Guidance Manual for Underground Storage Tank Closure & Release Response." March 2000.
- State of Hawaii Department of Health. Risk-Based Corrective Action and Decision-Making at Sites with Contaminated Soil and Groundwater. December 1995.
- State of Hawaii Department of Health. Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan. December 1996.
- US Department of Agriculture Soil Conservation Service. "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii." 1972.
- US Department of Health and Human Services, Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health, Pocket Guide to Chemical Hazards, [www.cdc.gov/niosh/npg/npg.html](http://www.cdc.gov/niosh/npg/npg.html).
- US Department of Interior Geological Survey. 1983. Lanai South Quadrangle, Island of Maui, 7.5 Minute Series (Topographic Map).

## Appendix 1: Exposure Pathway Assessment Data

### Former Emulsion Plant Lanai City, Hawaii

Contaminants of Concern: TPH-D, 1,2-dichloropropane, 4,4-DDT, heptachlor, and toxaphene  
 Estimated surface elevation of facility = 1550 feet msl  
 Estimated depth to groundwater = 800 to 900 feet bgs  
 Net precipitation: > 30 inches per year  
 Depth to Aquifer: > 250 feet  
 Soil type: Lahaina Silty Clay, 3 to 7 percent slopes, available water capacity 1.3-1.4 in/ft  
 Hydraulic conductivity:  $10^{-6}$  cm/sec (standard silt classification)  
 Thickness of lowest hydraulic conductivity layer: Greater than 500 feet,  $10^{-6}$  cm/sec (silt)

Description	TPH-D	1,2-dichloropropane	4,4-DDT	Heptachlor	Toxaphene
Maximum concentration (mg/kg)	5,100	230	6.1	1.8	2.4
Location & depth	B9, 41.5'	TP6, 15'	B9, 56.5'	B9, 41.5'	B10, 66.5'
Maximum depth detected	113'	66.5'	82.8'	103'	66.5'
Location & concentration at max depth	B9, 16 mg/kg	B11, 0.18 mg/kg	B10, 0.009 mg/kg	B9, 0.025 mg/kg	B10, 2.4 mg/kg
Minimum depth exceeding Tier 1 ALs or PRGs	41.5'	15'	26.5'	41.5'	66.5'
Location & concentration at min depth	B9, 5100 mg/kg	TP6, 230 mg/kg	B9, 0.9 mg/kg	B9, 1.8 mg/kg	B10, 2.4 mg/kg
DOH Tier 1 Action Level (mg/kg)	5,000		0.82		
EPA Region 9 PRG (residential soil, mg/kg)		0.34	1.7	0.11	0.44
EPA Region 9 PRG (industrial soil, mg/kg)		0.74	7.0	0.38	1.6
Water solubility		2700 mg/l @ 20°C	0.025 mg/l @ 25°C	0.05 mg/l @ 25°C	3 mg/l @ 25°C
Vapor pressure (mm Hg @ 25°C)		40	$2 \times 10^{-7}$	$3 \times 10^{-4}$	0.4
Henry's Law Constant (atm-m <sup>3</sup> /mol @ 24°C)		$2.07 \times 10^{-3}$	$8.3 \times 10^{-6}$	$1.48 \times 10^{-3}$	0.21
Density (g/cc)		1.16	0.99	1.66	1.65
Log K <sub>ow</sub>		1.99	6.91	5.44	3.30
Log K <sub>oc</sub>		1.67	5.18	4.34	2.474

Potentially Exposed Populations  
 Residents and workers within 1/4 mile  
 Drinking water wells approximately 0.9 miles  
 Surface waters approximately 2 miles  
 Sensitive ecological receptors not anticipated

Exposure Pathways (natural and engineered controls not considered)

Routes of Exposure	Receptor - Human	Receptor - Flora	Receptor - Fauna
Oral - Water	X	X	X
Oral - Soils	X	X	X
Dermal - Water	X	X	X
Dermal - Soils	X	X	X
Inhalation - Volatilization from Water	X	X	X
Inhalation - Volatilization from Soils	X	X	X

Effects of Natural or Engineered Controls

Routes of Exposure	Natural Barrier: Depth to Contaminants	Natural Barrier: Depth to Groundwater
Oral - Water	migration pathway broken	migration pathway broken
Oral - Soils	migration pathway broken	
Dermal - Water	migration pathway broken	migration pathway broken
Dermal - Soils	migration pathway broken	
Inhalation - Volatilization from Water	migration pathway broken	migration pathway broken
Inhalation - Volatilization from Soils	migration pathway broken	

## INFORMATION REQUEST

The County of Maui, Department of Environmental Management, Wastewater Reclamation Division (WWRD) received the following email in June 2016

>>> "Swindle, Kacey" <KSwindle@trcsolutions.com> 6/8/2016 9:53 AM >>>

We are conducting an Environmental Site Assessment at the property outlined in white on the attached map located in Lanai City, Lanai. This property encompasses portions of the following TMKs: 2-4-9-014:001, 2-4-9-014:009 and 2-4-9-002:001. In accordance with our requirements in conducting this assessment we need to confirm whether or not the County of Maui, Department of Environmental Management has any records for the property related to hazardous material contamination, underground storage tanks or other environmental issues.

TRC appreciates your assistance with this requirement of our assessment. If you have any questions or need further clarification regarding this request, please do not hesitate to contact us at (808) 927-5032, or you can email us at kswindle@trcsolutions.com.

Thank you,

Kacey Swindle  
Industrial Hygienist



1600 Kapiolani Boulevard, Suite 717, Honolulu, Hawaii 96814

T: 808.728.4111 | F: 808.638.5649 | C: 808.927.5032

The following pages reply to this inquiry.

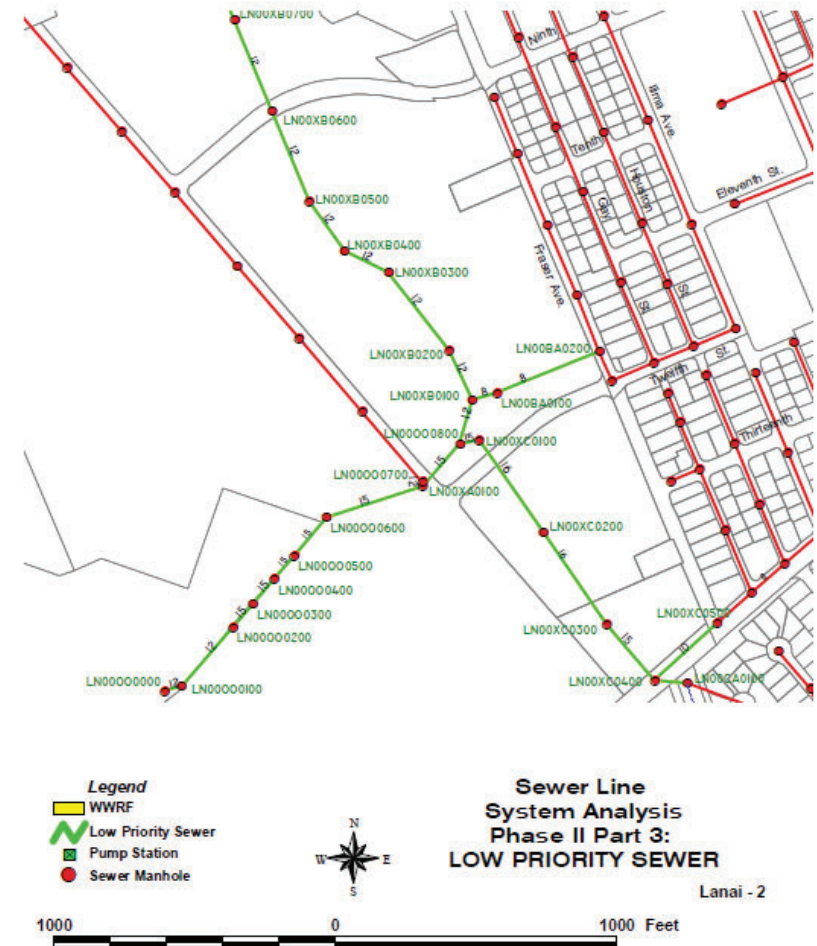
**County of Maui  
Island of Lanai  
Sewer System**

In response to the TRC request WWRD offers the following:

The property in question is in the County of Maui, Island of Lanai, Lanai City. It encompasses portions of the following TMKs: (2)4-9-014:001, (2)4-9-014:009 and (2)4-9-002:001.



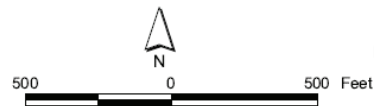
As can be seen in the above map, the property is just north of the Lanai Wastewater Reclamation Facility. There are significant trunk sewer lines and manholes that are owned, operated and maintained by the County of Maui which traverse the site. The last analysis of the system condition in 2009 showed that these lines are in very good condition. WWRD does not have any records that indicate any past problems or sewer spills in the area. However, there is always the possibility of these problems occurring in the future. The following pages are the excerpts from the last CCTV project verifying the condition of the lines. Please contact the Wastewater Reclamation Division (808-270-7417) should you have any additional questions.





#### LEGEND

- Additional Sewer CCTV
- Sewer CCTV
- Sewer
- Force main
- Sewer manhole
- Pump Station
- WWRP



#### Sewer Line System Analysis ISLAND OF MAUI CCTV 2009

LANAI Additional Lines  
Page 2 of 4

#### PO Number: 4B

Date: 10/20/2009 2:21:00 PM

Street: EASEMENT

Length Surveyed: 295.1

PO Number: 4B

Height (Diameter): 8

Pipe Segment Reference:

LN00XA0900LN00XA0800

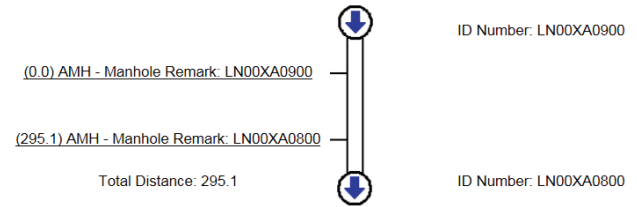
Upstream MH: LN00XA0900

Downstream MH: LN00XA0800

Direction of Survey: Downstream

Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

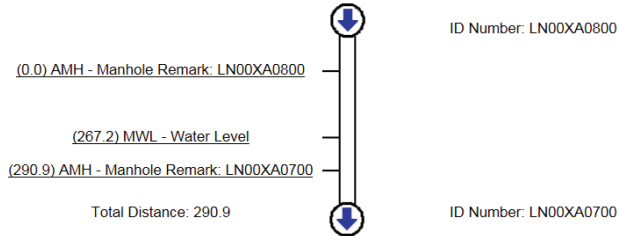
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0	51	AMH - Manhole							
		LN00XA0900							
295.1	510	AMH - Manhole							
		LN00XA0800							

# PO Number: 5B

Date: 10/20/2009 2:43:00 PM  
 Street: EASEMENT  
 Length Surveyed: 290.9  
 PO Number: 5B  
 Height (Diameter): 8

Pipe Segment Reference:  
 LN00XA0800LN00XA0700  
 Upstream MH: LN00XA0800  
 Downstream MH: LN00XA0700  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

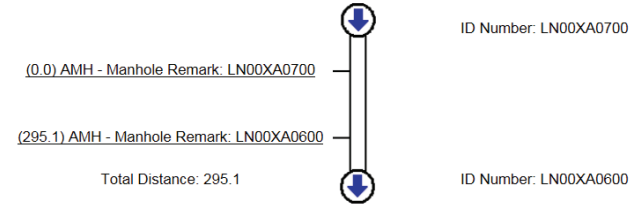
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0	28	AMH - Manhole						
		LN00XA0800						
267.2	478	MWL - Water Level			30			
290.9	690	AMH - Manhole						
		LN00XA0700						

# PO Number: 6B

Date: 10/22/2009 9:07:00 AM  
 Street: EASEMENT  
 Length Surveyed: 295.1  
 PO Number: 6B  
 Height (Diameter): 8

Pipe Segment Reference:  
 LN00XA0700LN00XA0600  
 Upstream MH: LN00XA0700  
 Downstream MH: LN00XA0600  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

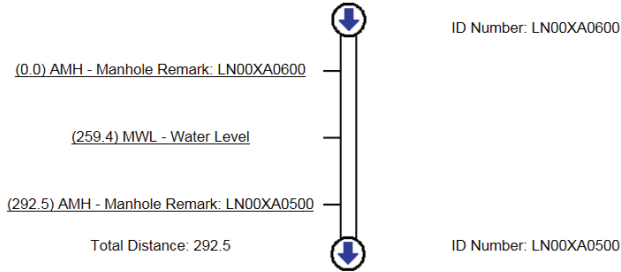
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				Dimension		%		At / From	To
				1st	2nd				
0	32	AMH - Manhole							
		LN00XA0700							
295.1	611	AMH - Manhole							
		LN00XA0600							

# PO Number: 7B

Date: 10/22/2009 9:20:00 AM  
 Street: EASEMENT  
 Length Surveyed: 292.5  
 PO Number: 7B  
 Height (Diameter): 8

Pipe Segment Reference:  
 LN00XA0600LN00XA0500  
 Upstream MH: LN00XA0600  
 Downstream MH: LN00XA0500  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

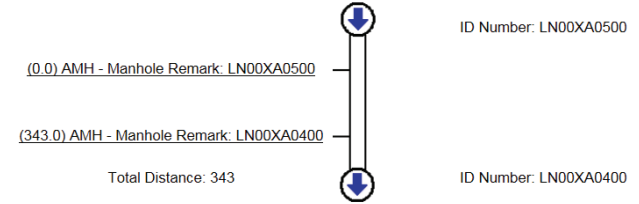
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				Dimension		%		At / From	To
				1st	2nd				
0	29	AMH - Manhole							
		LN00XA0600							
259.4	432	MWL - Water Level				15			
292.5	510	AMH - Manhole							
		LN00XA0500							

# PO Number: 8B

Date: 10/22/2009 9:31:00 AM  
 Street: EASEMENT  
 Length Surveyed: 343  
 PO Number: 8B  
 Height (Diameter): 10

Pipe Segment Reference:  
 LN00XA0500LN00XA0400  
 Upstream MH: LN00XA0500  
 Downstream MH: LN00XA0400  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

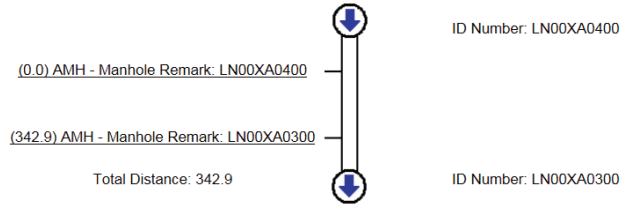
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				Dimension		%		At / From	To
				1st	2nd				
0	59	AMH - Manhole							
		LN00XA0500							
343	527	AMH - Manhole							
		LN00XA0400							

**PO Number: 9B**

Date: 10/22/2009 9:54:00 AM  
Street: EASEMENT  
Length Surveyed: 342.9  
PO Number: 9B  
Height (Diameter): 10

Pipe Segment Reference:  
LN00XA0400LN00XA0300  
Upstream MH: LN00XA0400  
Downstream MH: LN00XA0300  
Direction of Survey: Downstream  
Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

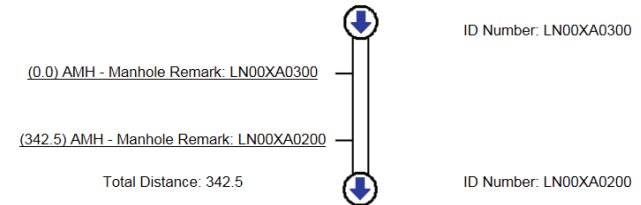
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				Dimension		%		At / From	To
0	27	AMH - Manhole		1st	2nd				
		LN00XA0400							
342.9	632	AMH - Manhole							
		LN00XA0300							

**PO Number: 10B**

Date: 10/22/2009 10:23:00 AM  
Street: EASEMENT  
Length Surveyed: 342.5  
PO Number: 10B  
Height (Diameter): 10

Pipe Segment Reference:  
LN00XA0300LN00XA0200  
Upstream MH: LN00XA0300  
Downstream MH: LN00XA0200  
Direction of Survey: Downstream  
Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

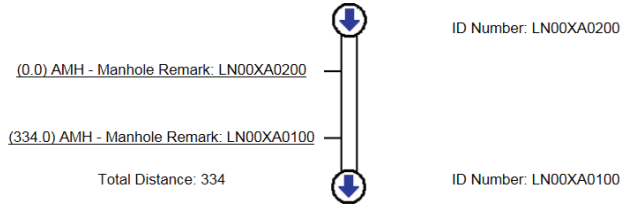
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0	36	AMH - Manhole		1st	2nd				
		LN00XA0300							
342.5	660	AMH - Manhole							
		LN00XA0200							

# PO Number: 15

Date: 10/22/2009 11:51:00 AM  
 Street: EASEMENT  
 Length Surveyed: 334  
 PO Number: 15  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XA0200LN00XA0100  
 Upstream MH: LN00XA0200  
 Downstream MH: LN00XA0100  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

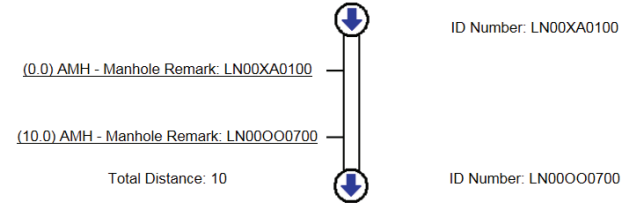
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0	29	AMH - Manhole		1st	2nd				
		LN00XA0200							
334	568	AMH - Manhole							
		LN00XA0100							

# PO Number: 14

Date: 10/22/2009 12:05:00 PM  
 Street: EASEMENT  
 Length Surveyed: 10  
 PO Number: 14  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XA0100LN00OO0700  
 Upstream MH: LN00XA0100  
 Downstream MH: LN00OO0700  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

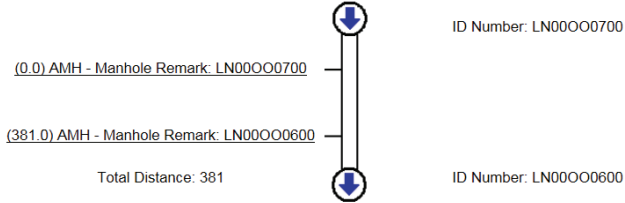
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				Dimension		%		At / From	To
0	31	AMH - Manhole		1st	2nd				
		LN00XA0100							
10	85	AMH - Manhole							
		LN00OO0700							

# PO Number: 12

Date: 10/23/2009 8:44:00 AM  
 Street: LANAI WWRF ACCESS RD  
 Length Surveyed: 381  
 PO Number: 12  
 Height (Diameter): 15

Pipe Segment Reference:  
 LN00000700LN00000600  
 Upstream MH: LN00000700  
 Downstream MH: LN00000600  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

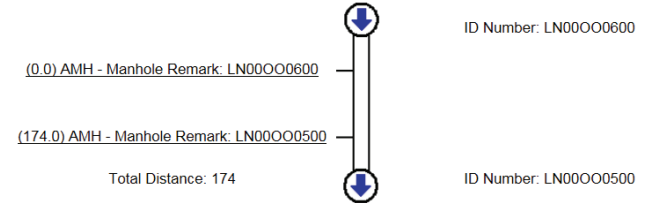
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				Dimension		%		At / From	To
				1st	2nd				
0	27	AMH - Manhole							
		LN00000700							
381	549	AMH - Manhole							
		LN00000600							

# PO Number: 11

Date: 10/23/2009 8:44:00 AM  
 Street: LANAI WWRF ACCESS RD  
 Length Surveyed: 174  
 PO Number: 11  
 Height (Diameter): 15

Pipe Segment Reference:  
 LN00000600LN00000500  
 Upstream MH: LN00000600  
 Downstream MH: LN00000500  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

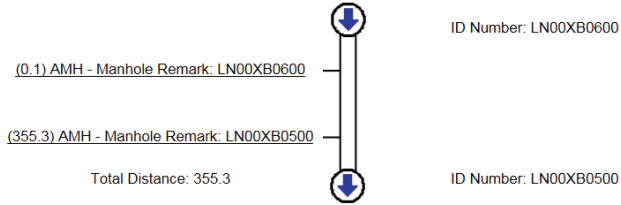
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				Dimension		%		At / From	To
				1st	2nd				
0	5	AMH - Manhole							
		LN00000600							
174	839	AMH - Manhole							
		LN00000500							

# PO Number: 21

Date: 10/21/2009 9:45:00 AM  
 Street: EASEMENT/NINTH ST  
 Length Surveyed: 355.3  
 PO Number: 21  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0600LN00XB0500  
 Upstream MH: LN00XB0600  
 Downstream MH: LN00XB0500  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

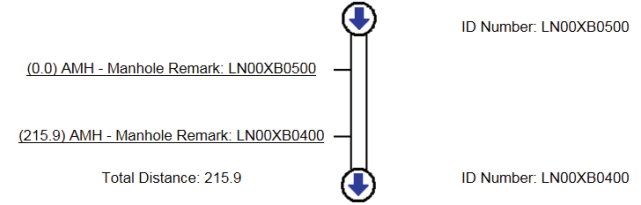
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				1st	2nd	%		At / From	To
0.1	26	AMH - Manhole							
		LN00XB0600							
355.3	659	AMH - Manhole							
		LN00XB0500							

# PO Number: 20

Date: 10/21/2009 9:45:00 AM  
 Street: EASEMENT  
 Length Surveyed: 215.9  
 PO Number: 20  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0500LN00XB0400  
 Upstream MH: LN00XB0500  
 Downstream MH: LN00XB0400  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

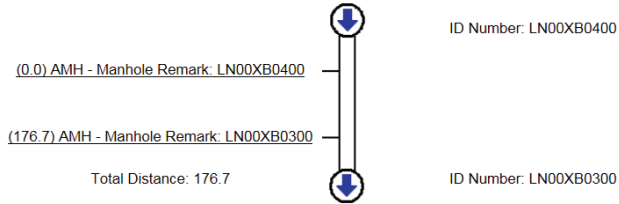
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				1st	2nd	%		At / From	To
0	28	AMH - Manhole							
		LN00XB0500							
215.9	472	AMH - Manhole							
		LN00XB0400							

# PO Number: 19

Date: 10/21/2009 10:12:00 AM  
 Street: EASEMENT  
 Length Surveyed: 176.7  
 PO Number: 19  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0400LN00XB0300  
 Upstream MH: LN00XB0400  
 Downstream MH: LN00XB0300  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

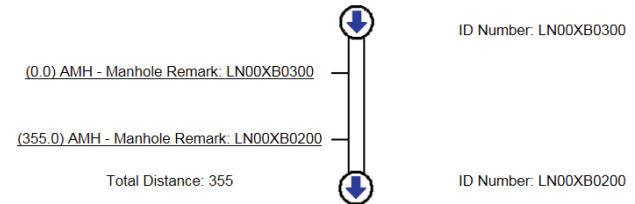
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	29	AMH - Manhole							
		LN00XB0400							
176.7	348	AMH - Manhole							
		LN00XB0300							

# PO Number: 18

Date: 10/21/2009 10:22:00 AM  
 Street: EASEMENT/AWALUA AVE  
 Length Surveyed: 355  
 PO Number: 18  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0300LN00XB0200  
 Upstream MH: LN00XB0300  
 Downstream MH: LN00XB0200  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

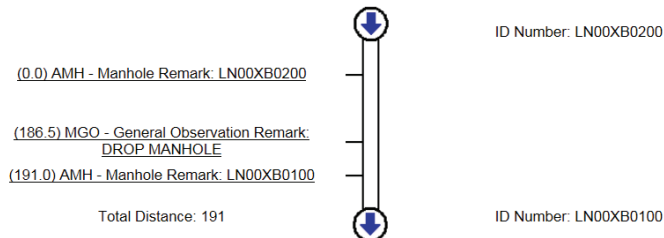
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	26	AMH - Manhole							
		LN00XB0300							
355	602	AMH - Manhole							
		LN00XB0200							

# PO Number: 17

Date: 10/21/2009 10:22:00 AM  
 Street: EASEMENT/AWALUA AVE  
 Length Surveyed: 191  
 PO Number: 17  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0200LN00XB0100  
 Upstream MH: LN00XB0200  
 Downstream MH: LN00XB0100  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

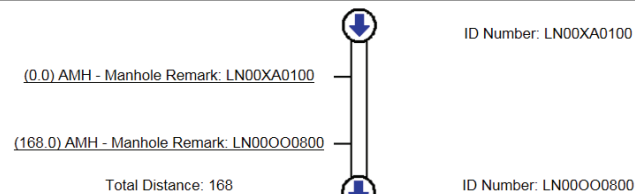
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	31	AMH - Manhole							
		LN00XB0200							
186.5	406	MGO - General Observation							
		DROP MANHOLE							
191	440	AMH - Manhole							
		LN00XB0100							

# PO Number: 16

Date: 10/23/2009 8:20:00 AM  
 Street: EASEMENT/AWALUA AVE  
 Length Surveyed: 168  
 PO Number: 16  
 Height (Diameter): 12

Pipe Segment Reference:  
 LN00XB0100LN00OO0800  
 Upstream MH: LN00XA0100  
 Downstream MH: LN00OO0800  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

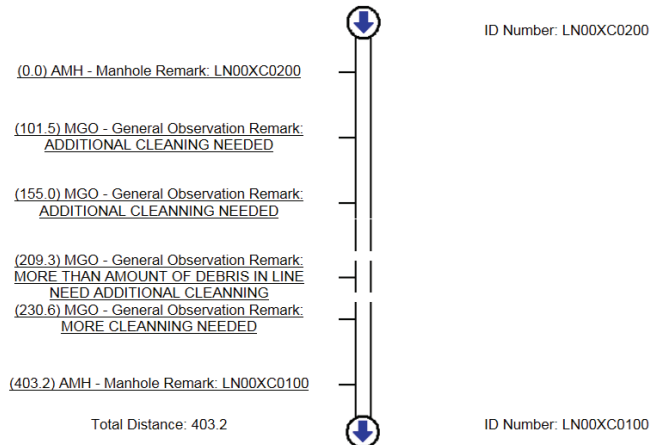
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
				1st	2nd				
0	27	AMH - Manhole							
		LN00XA0100							
168	336	AMH - Manhole							
		LN00OO0800							

# PO Number: 23

Date: 10/22/2009 1:07:00 PM  
 Street: EASEMENT/TWELFTH ST  
 Length Surveyed: 403.2  
 PO Number: 23  
 Height (Diameter): 16

Pipe Segment Reference:  
 LN00XC0200LN00XC0100  
 Upstream MH: LN00XC0200  
 Downstream MH: LN00XC0100  
 Direction of Survey: Downstream  
 Material: Reinforced Concrete Pipe

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

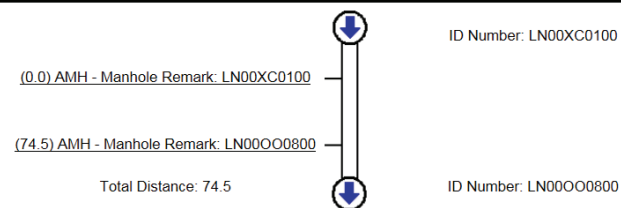
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
0	33	AMH - Manhole							
		LN00XC0200							
101.5	304	MGO - General Observation							
		ADDITIONAL CLEANING NEEDED							
155	832	MGO - General Observation							
		ADDITIONAL CLEANING NEEDED							
209.3	1073	MGO - General Observation							
		MORE THAN AMOUNT OF DEBRIS IN LINE NEED ADDITIONAL CLEANING							
230.6	935	MGO - General Observation							
		MORE CLEANING NEEDED							
403.2	267	AMH - Manhole							
		LN00XC0100							

# PO Number: 22

Date: 10/22/2009 4:16:00 PM  
 Street: EASEMENT/TWELFTH ST  
 Length Surveyed: 74.5  
 PO Number: 22  
 Height (Diameter): 15

Pipe Segment Reference:  
 LN00XC0100LN00000800  
 Upstream MH: LN00XC0100  
 Downstream MH: LN00000800  
 Direction of Survey: Downstream  
 Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
0	34	AMH - Manhole							
		LN00XC0100							
74.5	195	AMH - Manhole							
		LN00000800							

# PO Number: 13

Date: 10/22/2009 4:34:00 PM

Street: EASEMENT/WWRF ACCESS RD

Length Surveyed: 173

PO Number: 13

Height (Diameter): 15

Pipe Segment Reference:

LN00000800LN00000700

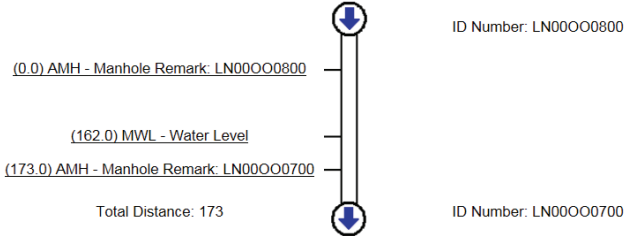
Upstream MH: LN00000800

Downstream MH: LN00000700

Direction of Survey: Downstream

Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension 1st	2nd	%		At / From	To
0	29	AMH - Manhole							
		LN00000800							
162	282	MWL - Water Level				40			
173	328	AMH - Manhole							
		LN00000700							

# PO Number: 2

Date: 10/20/2009 9:47:00 AM

Street: EASEMENT / TWELFTH ST

Length Surveyed: 399

PO Number: 2

Height (Diameter): 8

Pipe Segment Reference:

LN00BA0200LN00BA0100

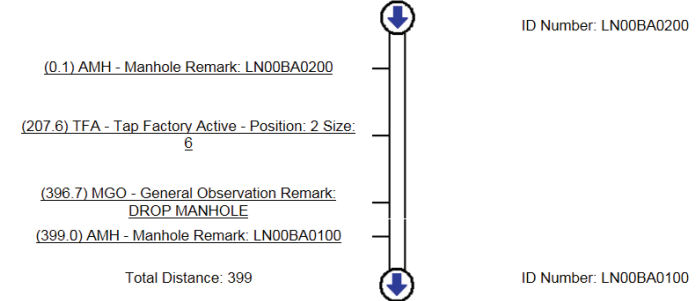
Upstream MH: LN00BA0200

Downstream MH: LN00BA0100

Direction of Survey: Downstream

Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

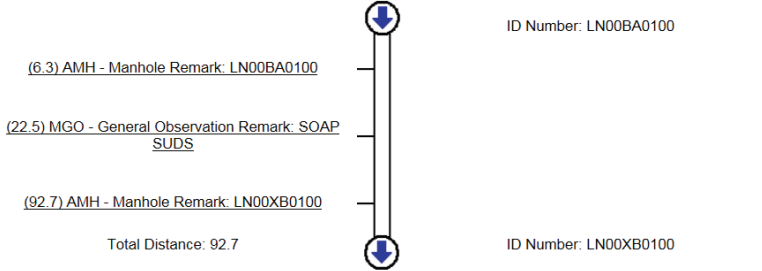
Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension 1st	2nd	%		At / From	To
0.1	36	AMH - Manhole							
		LN00BA0200							
207.6	372	TFA - Tap Factory Active		6				2	
396.7	727	MGO - General Observation							
		DROP MANHOLE							
399	759	AMH - Manhole							
		LN00BA0100							

PO Number: 1

Date: 10/21/2009 11:36:00 AM  
Street: EASEMENT/AWALUA AVE  
Length Surveyed: 92.7  
PO Number: 1  
Height (Diameter): 8

Pipe Segment Reference:  
LN00BA0100LN00XB0100  
Upstream MH: LN00BA0100  
Downstream MH: LN00XB0100  
Direction of Survey: Downstream  
Material: Polyvinyl Chloride

Severity
Light
Moderate
Average
Heavy
Severe



APPENDIX C:  
USER QUESTIONNAIRE

Grade	Structural	O&M	Overall
5	0	0	0
4	0	0	0
3	0	0	0
2	0	0	0
1	0	0	0
Overall	0	0	0
Number of Defects	0	0	0
Pipe Rating	0000	0000	0000

Distance	Video Ref	Code	Cont Defect	Value			Joint	Circumferential Location	
				Dimension		%		At / From	To
6.3	29	AMH - Manhole		1st	2nd				
		LN00BA0100							
22.5	80	MGO - General Observation							
		SOAP SUDS							
92.7	455	AMH - Manhole							
		LN00XB0100							


**ASTM E-1527 PHASE I ENVIRONMENTAL SITE ASSESSMENT  
PRE-SURVEY QUESTIONNAIRE AND DISCLOSURE STATEMENT**

**Borrower:** Please complete this questionnaire before the Consultant's site visit. For those questions that are not applicable to the subject please respond with an "N/A". This document must be signed by the Owner or his/her representative (Item No. 2). If you have any questions about how to answer any of the questions please call. If additional pages for response are necessary please attach them to this form. Clearly mark all references to the appropriate question number(s). This document and your written response to same will be an exhibit in our report.

**1. PROPERTY INFORMATION:**

Property Name: 200 units west of Lanai City		
Property Address: TMK: 2-4-09-014:001, TMK: 2-4-09-014:009, TMK 2-4-9-002:001		
City Lanai City	State Hawaii	Zip 96763
Assessor's Parcel Number: LC App. 862 Lot1209		

**2. COMPLETED BY**

Signature 	Date 06-02-16
Printed Name AJ Vergara	Title Engineering Coordinator

**3. ASTM-REQUIRED INQUIRIES**

Property Owner: Name: Pulama Lanai Phone: 808-565-3000 Fax: 808-565-3887	
Key Site Manager (Site contact): Name: AJ Vergara Phone: 808-565-3670 Fax: 808-565-3887	
<b>If not residential Property, please provide list of tenants, including contact names and phone numbers.</b>	
Can you provide a Current Title Abstract for the Property, including a chain of Title? If so, please send documents along with completed questionnaire.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Do you have knowledge of any environmental liens recorded against the Property, or environmentally related Activity and Use Limitations of the Property?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Do you have any specialized knowledge that would be material in identifying recognized environmental conditions in connection with the Property?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are you aware of a reduction in the property value due to environmental issues?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Please attach explanation of all affirmative answers.	



Please state reason for procuring this Phase 1 ESA:

- ☒ Qualify for Innocent Landowner defense to CERCLA Liability.  
☐ Other: (state below)

**4. PLEASE PROVIDE A GENERAL SITE DESCRIPTION BY COMPLETING THE FOLLOWING TABLE:**

Legal description/ boundary survey/ plat available for inspector TMK: 2-4-9-014:001, TMK:2-4-9-014:009, TMK 2-4-9-002:001	<input type="checkbox"/> Yes <input type="checkbox"/> No
Total Property Size 103 acres	
Total number of buildings 1	
Total square footage of buildings 7886' sf	
Date of construction	
Dates of significant renovation	
Waste water discharge <input checked="" type="checkbox"/> Municipal Sanitary Sewer <input type="checkbox"/> On-site septic system <input type="checkbox"/> Other	
Potable water source <input checked="" type="checkbox"/> Community Water Supplier <input type="checkbox"/> On-site well <input type="checkbox"/> Other	
Please describe prior use of property, if known: Zoned as Open Space and Agricultural	

**5. PREVIOUS INVESTIGATIONS:**

Have any previous environmental investigations been performed at the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>INVESTIGATION TYPE</b> If yes, please describe conclusions, and attach copy of report(s)	
<input type="checkbox"/> Phase 1 ESA	
<input type="checkbox"/> Phase 2 ESA	
<input type="checkbox"/> Tank Tightness Testing	
<input type="checkbox"/> Asbestos Survey/ O&M	
<input type="checkbox"/> Radon	
<input type="checkbox"/> Lead-based Paint	
<input type="checkbox"/> Lead in Water	
<input type="checkbox"/> Operations & Maintenance Plan(s)	
<input checked="" type="checkbox"/> Other	Old Mecco Power Plant Building assessment



**6. ON SITE OPERATIONS**

Are you aware of any of the following conditions, either past or present, on the site?		
Condition	Response	If yes, please describe
1. Stored Chemicals	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
2. Underground Storage Tanks	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
3. Aboveground Storage Tanks	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Spills or Releases	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Dump Areas/ Landfills	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6. Waste Treatment Systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7. Clarifiers/ Separators	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
8. Air stacks/ Vents/ Odors	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9. Floor Drains/Sumps	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
10. Stained Soil/ Impacted Vegetation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
11. On-site OWNED Electrical Transformers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
12. Hydraulic lifts/ Elevators	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
13. Dry Cleaning Operations	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
14. Wetlands/ Flooding	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
15. Oil/ Gas/ Water/ Monitoring Wells	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
16. Environmental Cleanups	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
17. Environmental Permits	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, please describe and ATTACH ALL COPIES of permits. Please attach last three waste manifests.
a) Industrial Discharge	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
b) POTW (NPDES)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
c) Hazardous Waste Generator	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
d) Air Quality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
e) Flammable Materials	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
f) AST/UST	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
g) Waste Manifest(s)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
h) other	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

**APPENDIX D:  
HISTORICAL RESEARCH INFORMATION**

Lanai City Expansion - 200 Housing Units

Awalua Avenue

Lanai City, HI 96763

Inquiry Number: 4620578.9

May 17, 2016

## The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

### EDR Aerial Photo Decade Package

05/17/16

<b>Site Name:</b>	<b>Client Name:</b>
Lanai City Expansion - 200 Hoi	TRC
Awalua Avenue	7600 N. 16th Street
Lanai City, HI 96763	Phoenix, AZ 85020
EDR Inquiry # 4620578.9	Contact: Kacey Swindle



Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

#### Search Results:

Year	Scale	Details	Source
1992	1"=500'	Flight Date: September, 23 1992	USGS
1976	1"=1000'	Flight Date: December, 17 1976	USGS
1965	1"=500'	Flight Date: January, 20 1965	USGS
1952	1"=750'	Flight Date: January, 26 1952	USGS

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Lanai City Expansion - 200 Housing Units  
Awalua Avenue  
Lanai City, HI 96763

Inquiry Number: 4620578.4  
May 16, 2016

## EDR Historical Topo Map Report with QuadMatch™



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
www.edrnet.com

### EDR Historical Topo Map Report

05/16/16

<b>Site Name:</b>	<b>Client Name:</b>
Lanai City Expansion - 200 Hoi	TRC
Awalua Avenue	7600 N. 16th Street
Lanai City, HI 96763	Phoenix, AZ 85020
EDR Inquiry # 4620578.4	Contact: Kacey Swindle



EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by TRC were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDR's Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		Coordinates:	
P.O.#		Latitude:	20.821115 20° 49' 16" North
Project:	258407	Longitude:	-156.923237 -156° 55' 24" West
		UTM Zone:	Zone 4 North
		UTM X Meters:	716127.24
		UTM Y Meters:	2303742.85
		Elevation:	1548.94' above sea level

#### Maps Provided:

2013  
1992  
1984  
1925  
1923

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#### Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

##### 2013 Source Sheets



Lanai North

7.5-minute, 24000



Lanai South

7.5-minute, 24000

##### 1992 Source Sheets



Haalelepaakai

7.5-minute, 24000  
Aerial Photo Revised 1992



Lanai City

7.5-minute, 24000  
Photo Inspected 1992  
Aerial Photo Revised 1992

##### 1984 Source Sheets



Lanai North

7.5-minute, 25000  
Aerial Photo Revised 1978  
Edited 1984

##### 1925 Source Sheets



Island of Lanai

15-minute, 62500

#### Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

##### 1923 Source Sheets

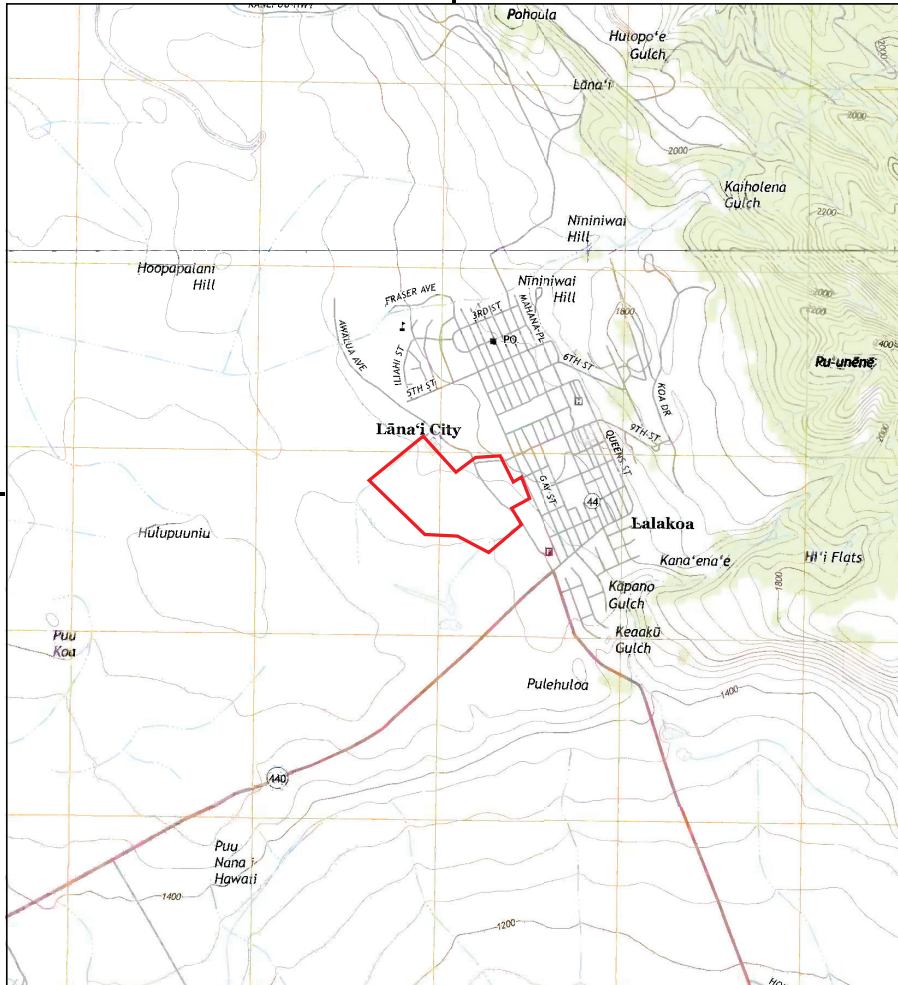


Island of Lanai

15-minute, 62500

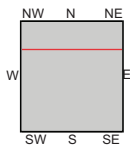
# Historical Topo Map

2013



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



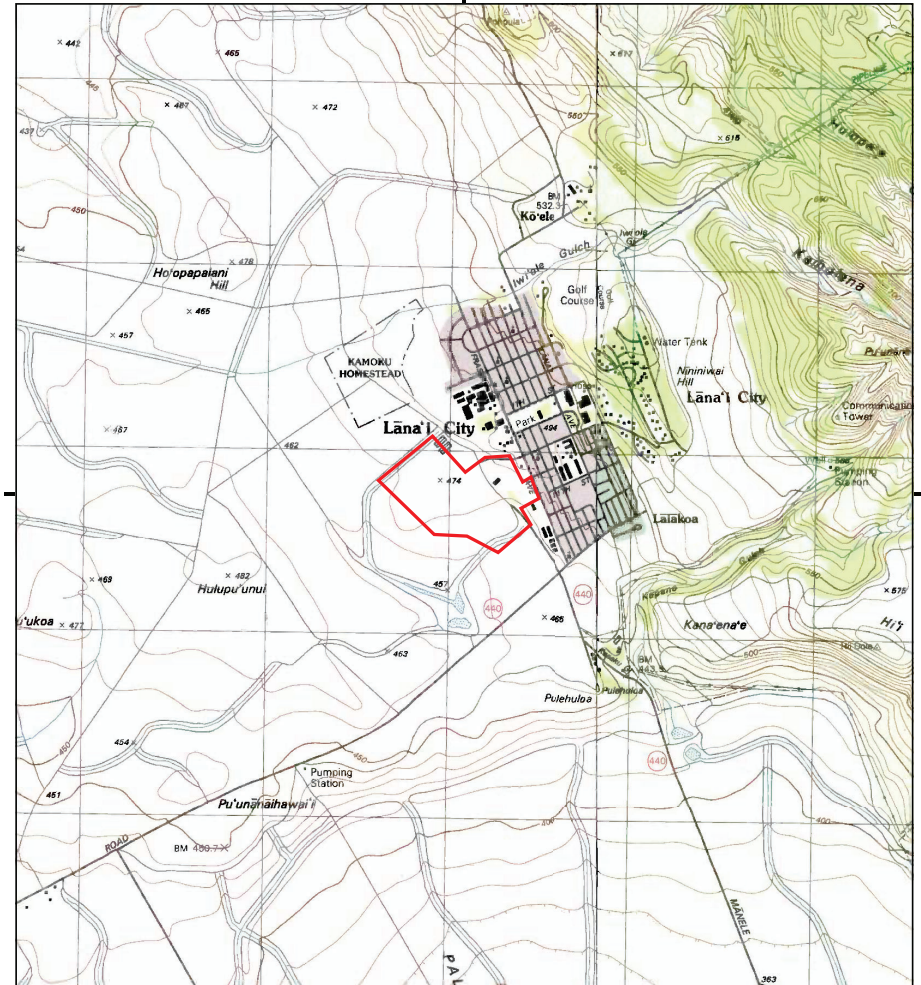
TP, Lanai South, 2013, 7.5-minute  
NE, Lanai North, 2013, 7.5-minute

SITE NAME: Lanai City Expansion - 200 Housing Units  
ADDRESS: Awalua Avenue  
Lanai City, HI 96763  
CLIENT: TRC



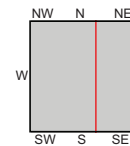
# Historical Topo Map

1992



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



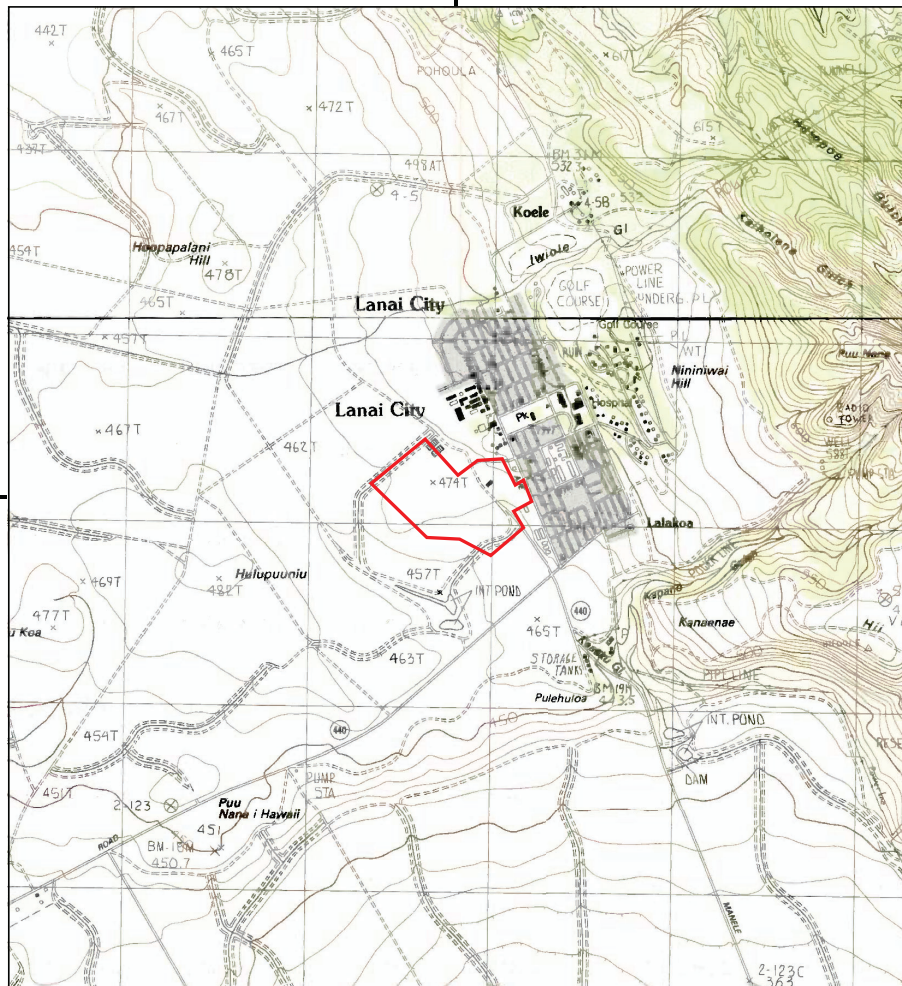
TP, Lanai City, 1992, 7.5-minute  
SE, Haalelepaakai, 1992, 7.5-minute

SITE NAME: Lanai City Expansion - 200 Housing Units  
ADDRESS: Awalua Avenue  
Lanai City, HI 96763  
CLIENT: TRC

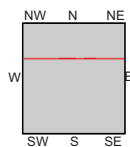
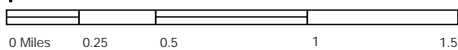


# Historical Topo Map

1984



This report includes information from the following map sheet(s).



TP, Lanai South, 1984, 7.5-minute  
N, Lanai North, 1984, 7.5-minute

SITE NAME: Lanai City Expansion - 200 Housing Units  
ADDRESS: Awalua Avenue  
Lanai City, HI 96763  
CLIENT: TRC



# Historical Topo Map

1925

