

APPENDIX D

GROUNDWATER MONITORING WELL ABANDONMENT LOGS



Matrix Environmental Services, L.L.C.
Integrated Environmental Solutions

Matrix Environmental Services
1601 Blake Street, Suite 200
Denver, Colorado 80202
(303) 572-0200
(303) 572-0202

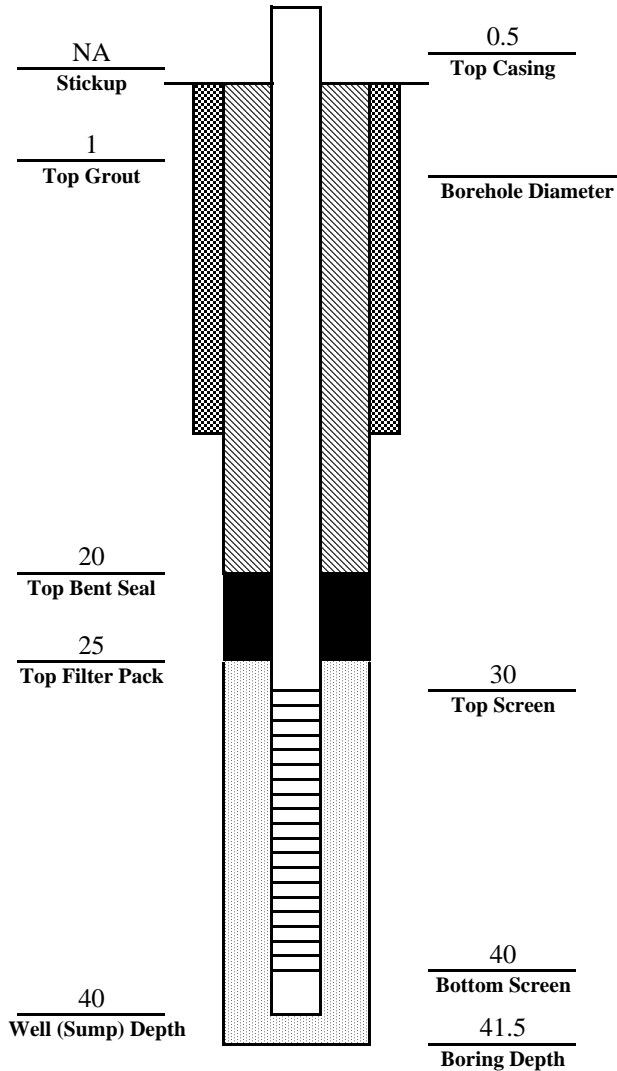
Project	McClellan	Well ID	LF1-G01
Project No.		Location (Site)	Landfill 1

MONITORING WELL ABANDONMENT

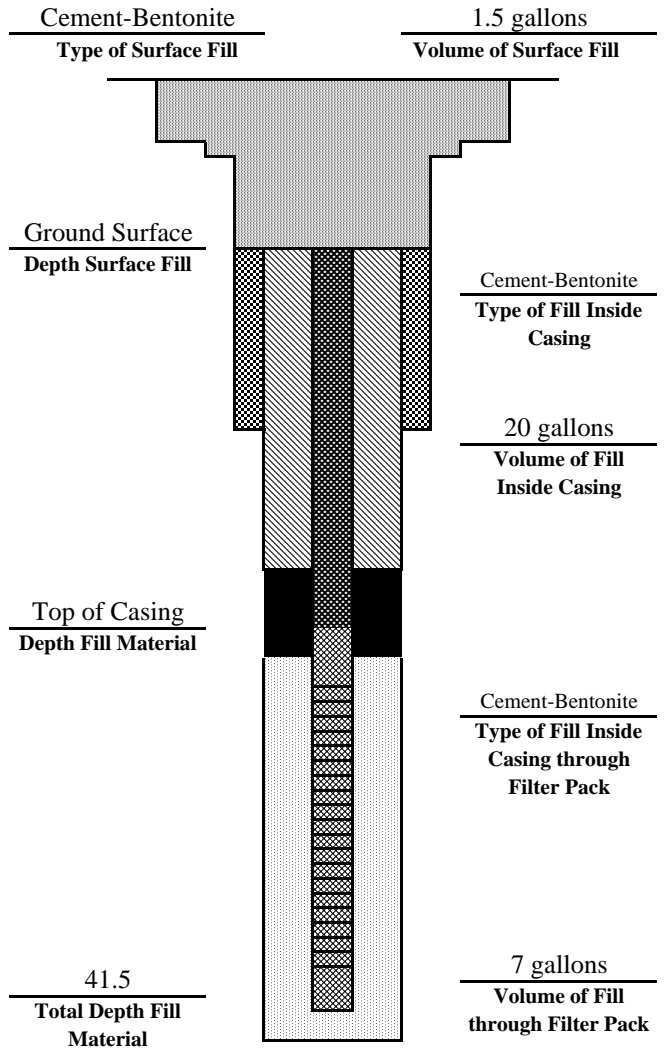
Abandoned By	Miller Drlg/Glen Bilbrey	Date	9/21/2006	Well Type	4-inch PVC	Northing	1170290.74	Easting	664874.42
Observed Water Level	31 feet	Observed Well Depth	41.5 feet	Well Finish and Protective Casing Type and Description					
Flush-Mounted Steel Vault/Cover set in Concrete Pad									

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After Abandonment



notes:

Well was sealed with grout mixture prepared by adding granular bentonite at the rate of 5 lbs. per each 94 lb. sack of Type I Portland cement and mixing with 7 gallons of potable water per sack to form a pumpable slurry. Grout was prepared in a mechanical mixer and was pumped to the bottom of the well through a 1" diameter PCV tremie pipe.

Screen Volume-	7
Casing Volume-	20
Total (gal.) -	27

Concrete Pad Removed

Protective Posts Removed

Flush Mount Removed

Outer Casing Removed

Inner Casing Removed

Length of Inner Casing Removed 2 feet

No	Yes	NA
X		
		X
	X	
		X

No	Yes	Partial
		X



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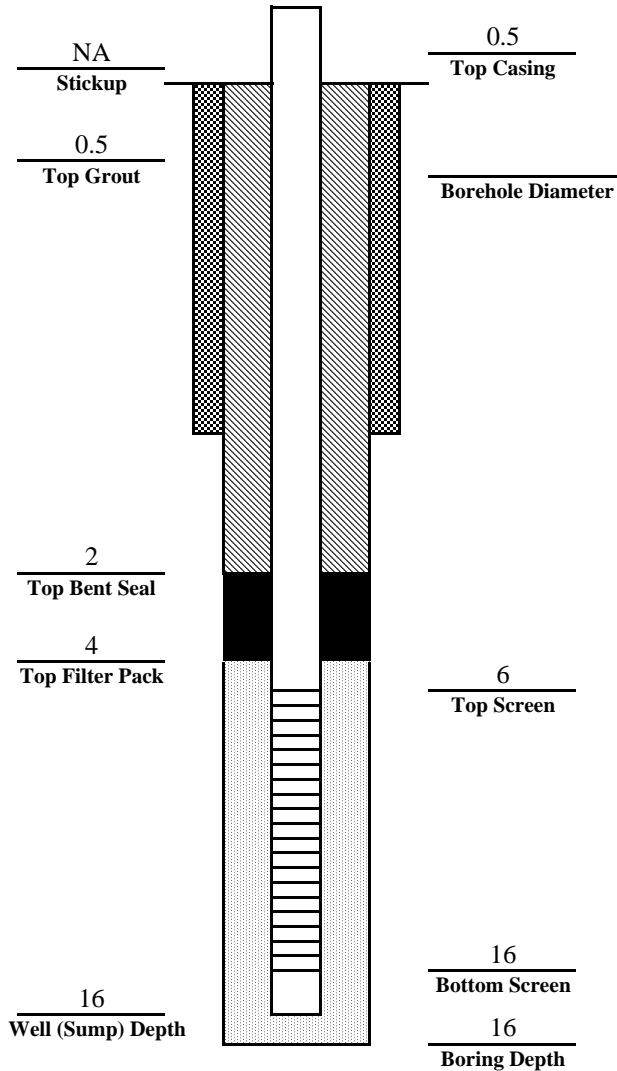
Project	McClellan	Well ID	LF1-G02
Project No.		Location (Site)	Landfill 1

MONITORING WELL ABANDONMENT

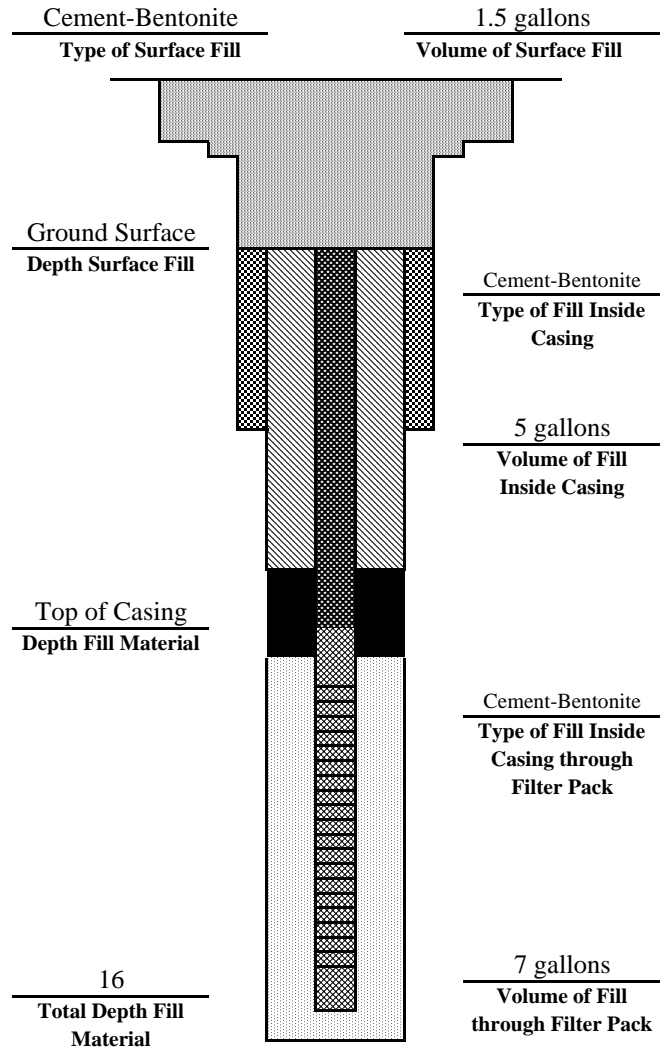
Abandoned By	Miller Drlg/Glen Bilbrey	Date	9/21/2006	Well Type	4-inch PVC	Northing	1170126.76	Easting	665573.48
Observed Water Level	ground level	Observed Well Depth	16	Well Finish and Protective Casing Type and Description					
	feet		feet	Flush-Mounted Steel Vault/Cover set in Concrete Pad					

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After Abandonment



notes:

Well was sealed with grout mixture prepared by adding granular bentonite at the rate of 5 lbs. per each 94 lb. sack of Type I Portland cement and mixing with 7 gallons of potable water per sack to form a pumpable slurry. Grout was prepared in a mechanical mixer and was pumped to the bottom of the well through a 1" diameter PCV tremie pipe.

Screen Volume-	7
Casing Volume-	4
Total (gal.) -	11

- Concrete Pad Removed**
- Protective Posts Removed**
- Flush Mount Removed**
- Outer Casing Removed**
- Inner Casing Removed**
- Length of Inner Casing Removed** 2 feet

	No	Yes	NA
Concrete Pad Removed	X		
Protective Posts Removed			X
Flush Mount Removed		X	
Outer Casing Removed			X

	No	Yes	Partial
Inner Casing Removed			X



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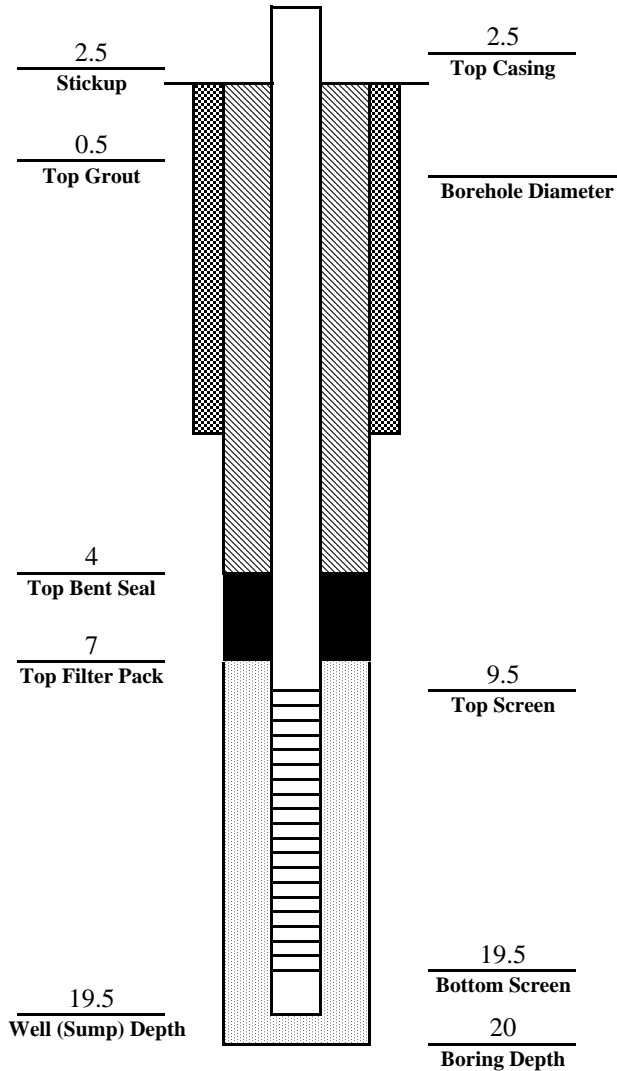
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Project No.		Location (Site)	Landfill 1

MONITORING WELL ABANDONMENT

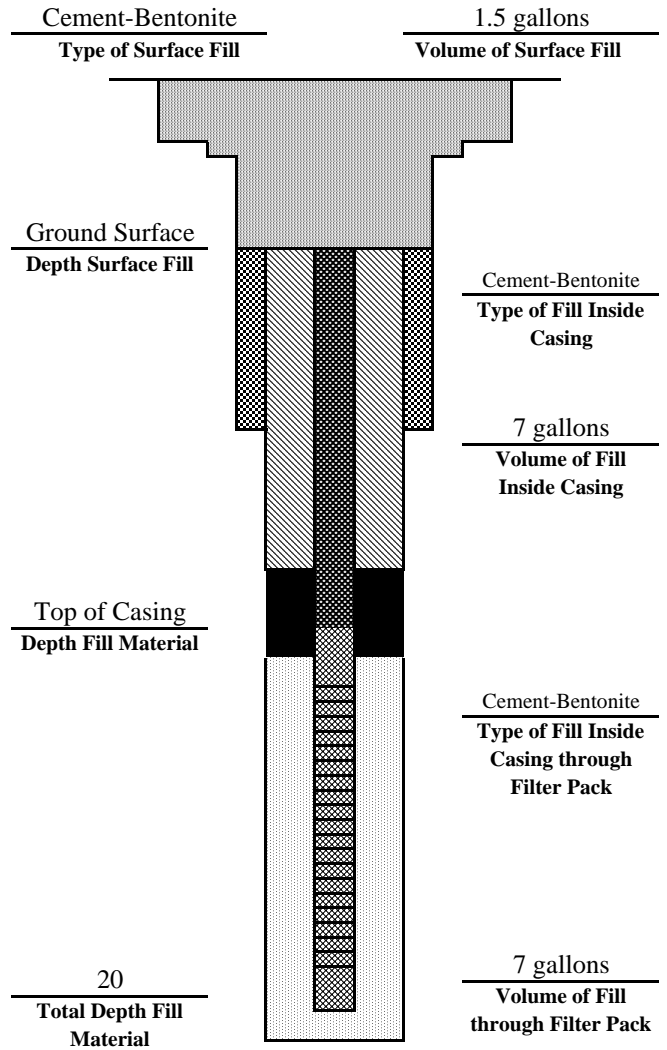
Abandoned By	Date	Well Type	Northing	Easting
Miller Drlg/Glen Bilbrey	9/21/2006	4-inch PVC	1169724.79	665328.47
Observed Water Level	Observed Well Depth	Well Finish and Protective Casing Type and Description		
3 feet	20 feet	4" x 4" steel shroud set in concrete pad w/ 3 steel bollards		

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After Abandonment



notes:

Well was sealed with grout mixture prepared by adding granular bentonite at the rate of 5 lbs. per each 94 lb. sack of Type I Portland cement and mixing with 7 gallons of potable water per sack to form a pumpable slurry. Grout was prepared in a mechanical mixer and was pumped to the bottom of the well through a 1" diameter PCV tremie pipe.

Screen Volume-	7
Casing Volume-	6
Total (gal.) -	13

	No	Yes	NA
Concrete Pad Removed		X	
Protective Posts Removed		X	
Flush Mount Removed			X
Outer Casing Removed		X	
Inner Casing Removed			X
Length of Inner Casing Removed		2	feet



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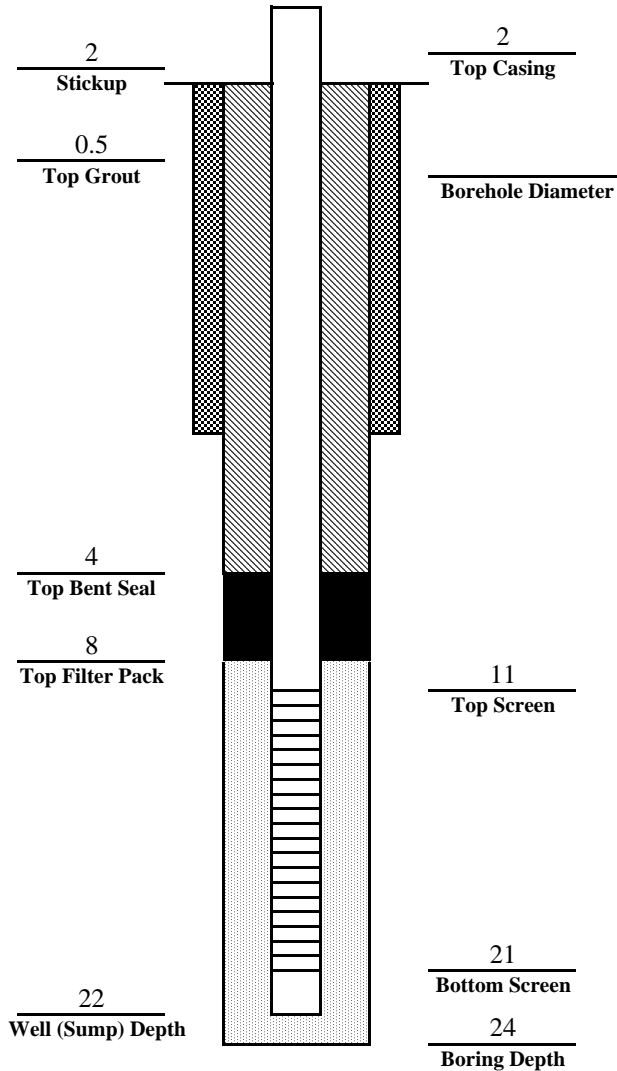
Project	McClellan	Well ID	LF1-G04
Project No.		Location (Site)	Landfill 1

MONITORING WELL ABANDONMENT

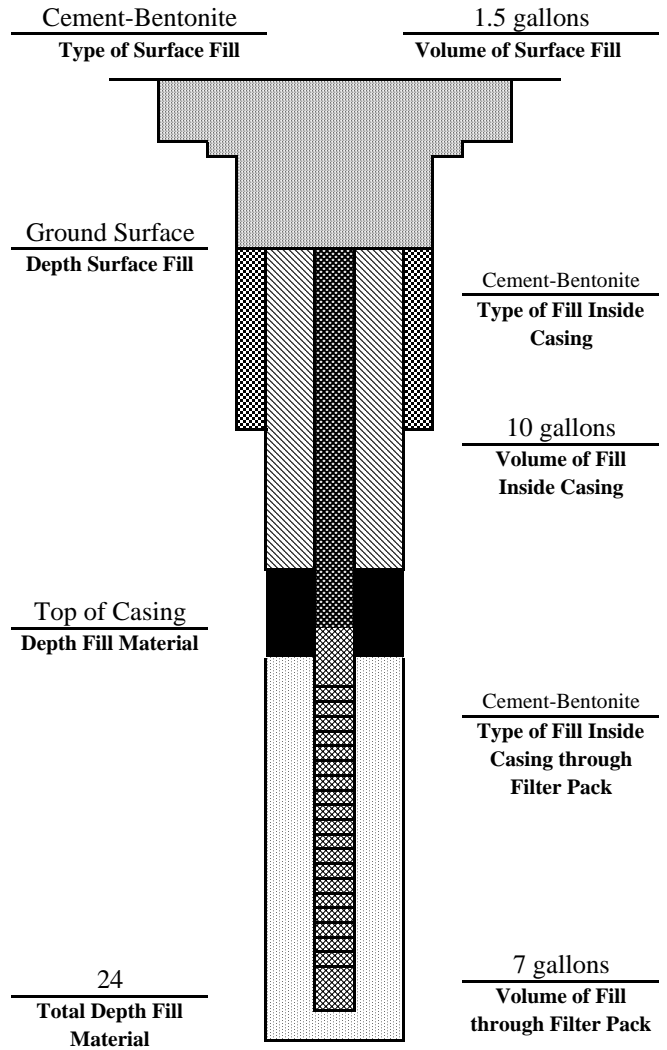
Abandoned By	Date	Well Type	Northing	Easting
Miller Drlg/Glen Bilbrey	9/21/2006	4-inch PVC	1170290.74	664874.42
Observed Water Level	Observed Well Depth	Well Finish and Protective Casing Type and Description		
5.1 feet	24 feet	4" x 4" steel shroud set in concrete pad w/ 3 steel bollards		

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After Abandonment



notes:

Well was sealed with grout mixture prepared by adding granular bentonite at the rate of 5 lbs. per each 94 lb. sack of Type I Portland cement and mixing with 7 gallons of potable water per sack to form a pumpable slurry. Grout was prepared in a mechanical mixer and was pumped to the bottom of the well through a 1" diameter PCV tremie pipe.

Screen Volume-	8
Casing Volume-	7
Total (gal.) -	15

	No	Yes	NA
Concrete Pad Removed		X	
Protective Posts Removed		X	
Flush Mount Removed			X
Outer Casing Removed		X	
Inner Casing Removed			X
Length of Inner Casing Removed		2	feet



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Project
 McClellan
 Project No.
 04.094.029.01

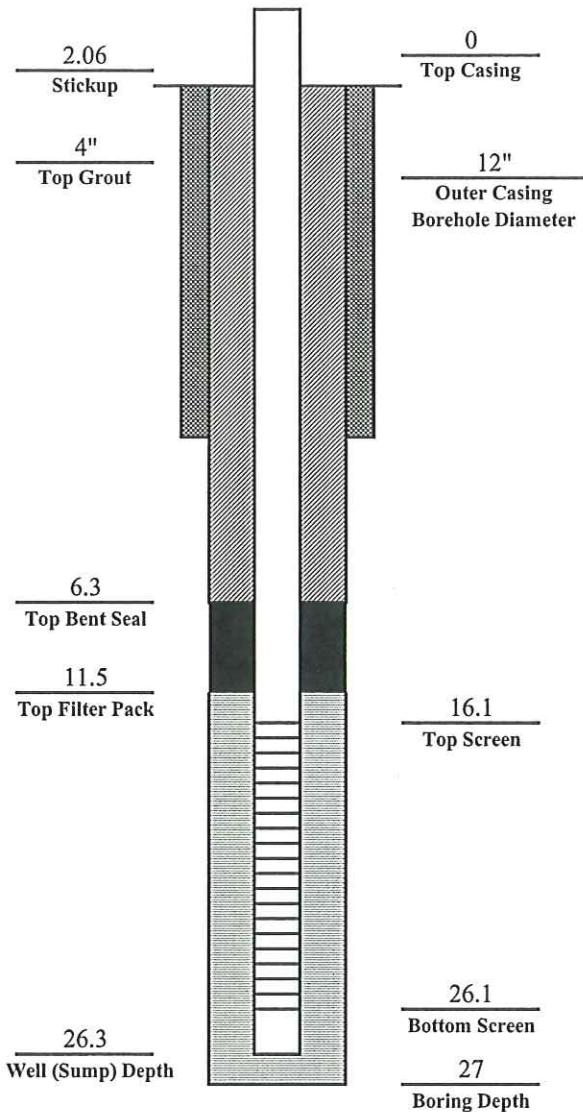
Well ID
 LF2-G01
 Location (Site)
 Landfill 2

MONITORING WELL ABANDONMENT

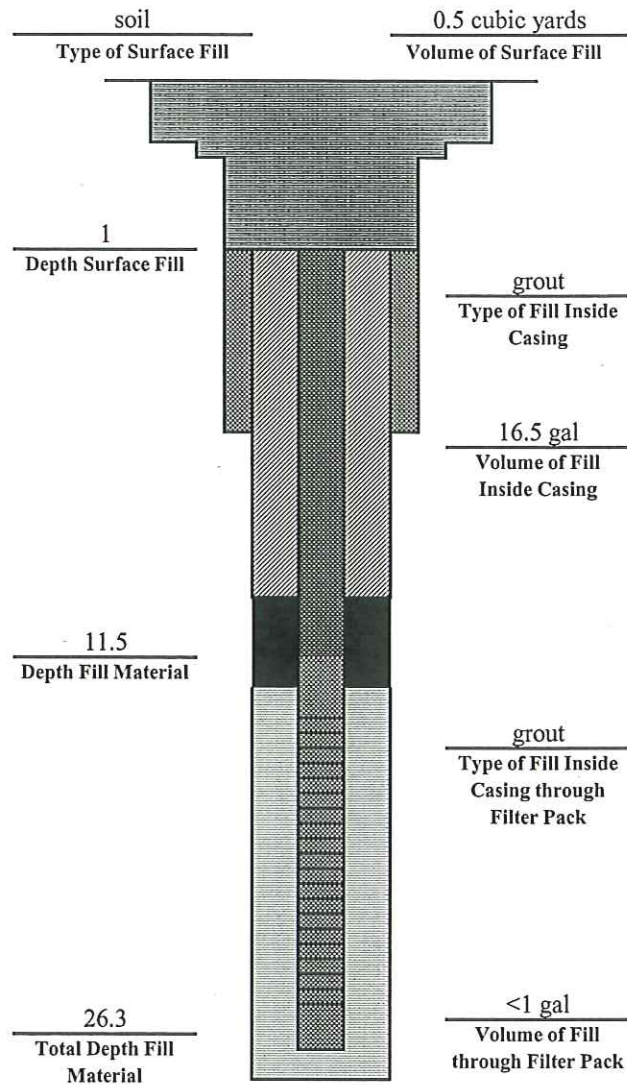
Abandoned By Harmon Engineering	Date 7/14/2008	Well Type 4" Schd 40 PVC Well	Northing 1175440.33	Easting 672890.59
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Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After to Abandonment



notes:

water at 26.1' below top of casing
 approximate total volume of grout: 17 gallons

- Concrete Pad Removed
- Protective Posts Removed
- Flush Mount Removed
- Outer Casing Removed

	No	Yes	NA
Concrete Pad Removed		x	
Protective Posts Removed		x	
Flush Mount Removed			x
Outer Casing Removed	x		

Inner Casing Removed

	No	Yes	Partial
Inner Casing Removed	x		

Length of Inner Casing Removed _____ feet



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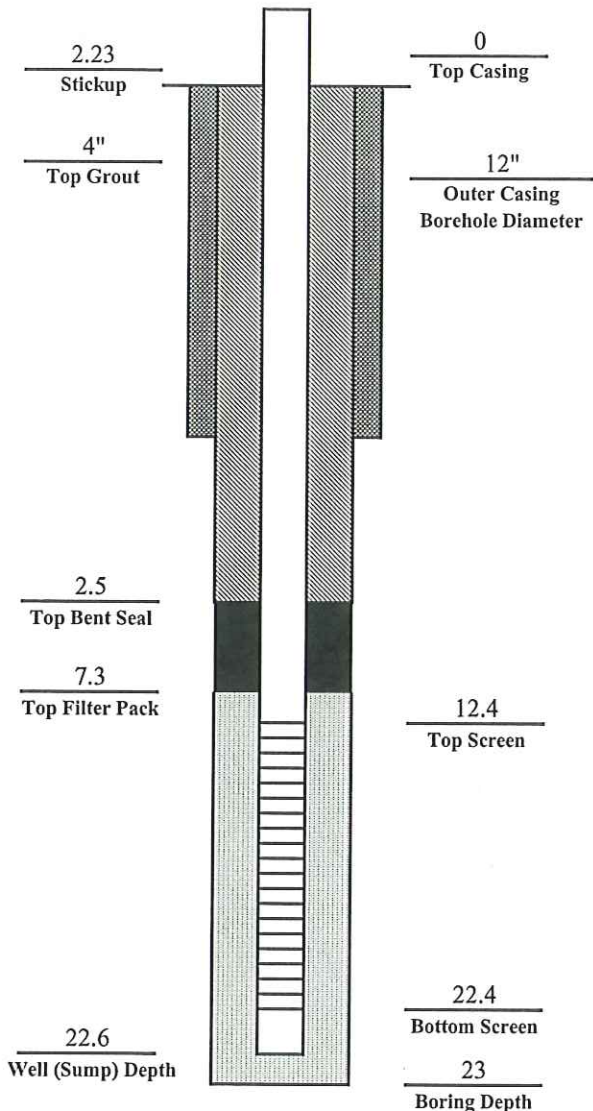
Project	McClellan	Well ID	LF2-G02
Project No.	04.094.029.01	Location (Site)	Landfill 2

MONITORING WELL ABANDONMENT

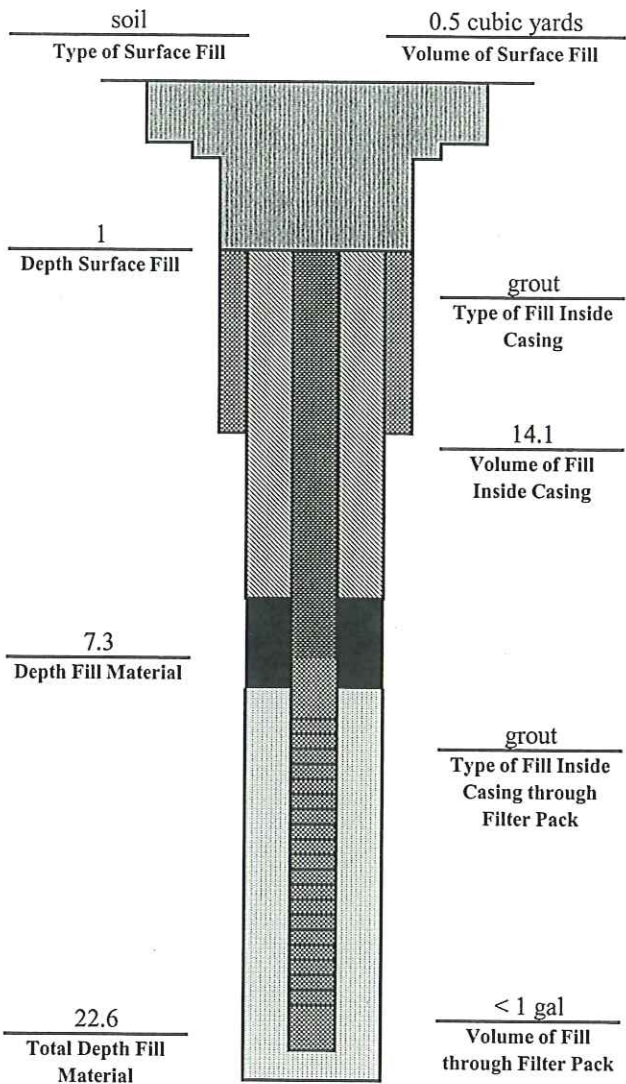
Abandoned By	Date	Well Type	Northing	Easting
Harmon Engineering	7/14/2008	4" Schd 40 PVC Well	1175137.16	672752.47

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After to Abandonment



notes:

water at 10.8' bgs
 approximate total volume of grout: 15 gallons

- Concrete Pad Removed
- Protective Posts Removed
- Flush Mount Removed
- Outer Casing Removed

	No	Yes	NA
Concrete Pad Removed		x	
Protective Posts Removed		x	
Flush Mount Removed			x
Outer Casing Removed	x		

Inner Casing Removed

Length of Inner Casing Removed _____ feet

	No	Yes	Partial
Inner Casing Removed	x		



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Project
McClellan
Project No.
04.094.029.01

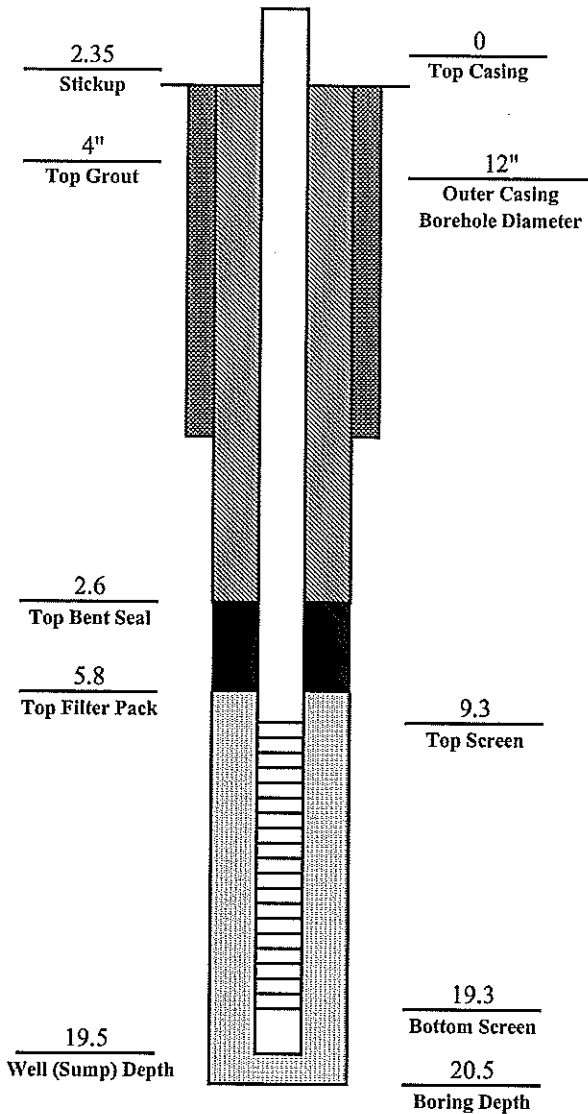
Well ID
6-5-09
LF2-3 LF2-603
Location (Site)
Landfill 2

MONITORING WELL ABANDONMENT

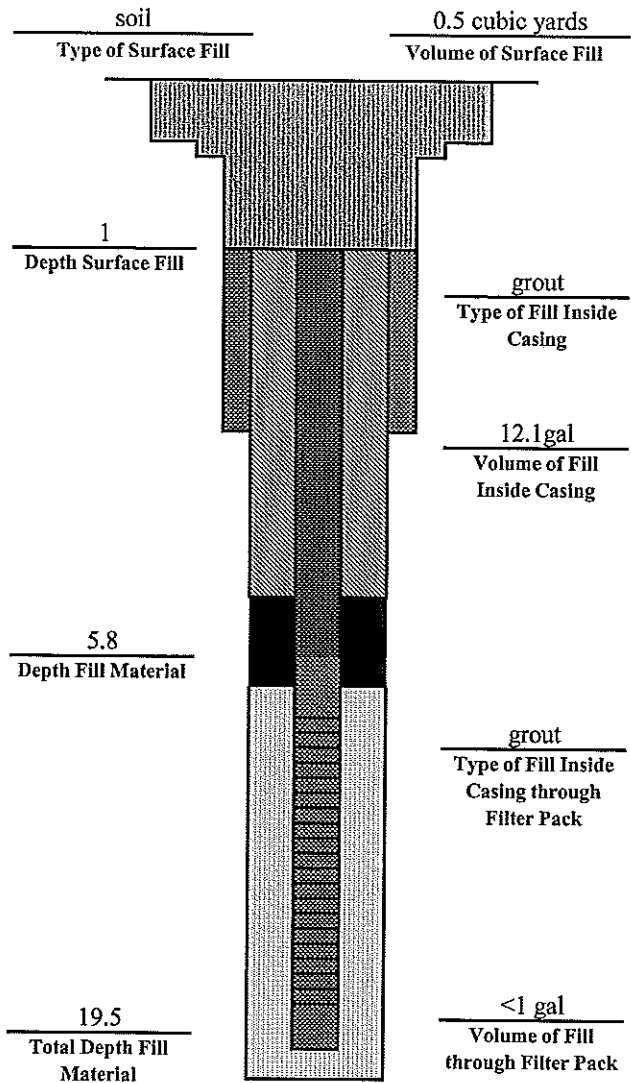
Abandoned By Harmon Engineering	Date 7/14/2008	Well Type 4" Schd 40 PVC Well	Northing 1175215.24	Easting 673113.92
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Well Summary Prior to Abandonment

Data presented in feet bgs



Well Summary After to Abandonment



notes:

water at 9' below ground surface
approximate total volume of grout: 13 gallons
casing removed.

- Concrete Pad Removed
- Protective Posts Removed
- Flush Mount Removed
- Outer Casing Removed

	No	Yes	NA
Concrete Pad Removed		x	
Protective Posts Removed		x	
Flush Mount Removed			x
Outer Casing Removed		x	

Inner Casing Removed No Yes Partial

Length of Inner Casing Removed _____ feet

Table 1
Williams-Russell and Johnson, Inc
Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
PPMP227-GP11	2	3/22/04	0/0	3.4	23.55	35.25	33 44.78N 85 46.53W	838	5.74575	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
PPMP227-GP10	2	3/22/04	0/0	2.15	24.1	32.4	33 44.79N 85 46.43W	847	5.2812	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

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PPMP227-GP02	2	3/22/04	0/0	2.1	20.75	31.06	33 44.77N 85 46.78W	771	5.06278	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
PPMP227-GP04	2	3/22/04	0/0	3.08	25	33.01	33 44.80N 85 46.71W	781	5.38063	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

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PPMP227-GP05	2	3/22/04	0/0	2.35	23.1	33.01	33 44.83N 85 46.69W	807	5.38063	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
FTA126-GP01	2	3/23/04	0/0	2.8	3.05	11.1	33 44.86N 85 46.66W	746	1.8093	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

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Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
FTA126-GP06 PPMP 227- JK 12-9-09	2	3/23/04	0/0	2.4	0.5	8.4	33 44.88N 85 46.63W	781	1.3692	Each PVC inner casing well was pulled with a drill rig up to 10 feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
FTA126-GP03	2	3/23/04	0/0	2.9	0.8	7	33 44.87N 85 46.58W	784	1.141	Each PVC inner casing well was pulled with a drill rig up to 10 feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

Table 1
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Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
PPMP227-GP03	2	3/23/04	0/0	0.8	26.7	30.85	33 44.81N 85 46.77W	804	5.02855	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
PPMP227-GP08	2	3/23/04	0/0	2	5.7	9.5	33 44.86N 85 46.56W	749	1.5485	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

Table 1
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Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
PPMP227-GP01	2	3/23/04	0/0	2	18.5	33.8	33 44.75N 85 46.66W	777	5.5094	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
PPMP227-GP09	2	3/23/04	0/0	0.8	5.7	9	Could not obtain fix on satellite	751	1.467	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

Table 1
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Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
PPMP227-GP07	2	3/23/04	0/0	0.4	27.5	35.5	Could not obtain fix on satellite	Could not obtain fix on satellite	5.7865	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.
PPMP227-GP12	2	3/23/04	0/0	2	28.9	42.3	Could not obtain fix on satellite	Could not obtain fix on satellite	6.8949	Each PVC inner casing well was pulled with a drill rig up to 10-feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

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Well Abandonment for Reilly Lake
Parcel 227 (7) and Parcel 126 (7)

Well No.	Casing Diam. (inches)	Date	PID/OVA Reading	Stick Up (ft)	Water level (ft)	Total Depth (ft)	GPS	Elevation (ft)	Concrete Trimmer Downhole (gal.)	Comment
FA227-SB02 PPMP-227- GP13 AR 12-9-09	2	3/23/04	0/0	1.5	21	40.3	Could not obtain fix on satellite	Could not obtain fix on satellite	6.5689	Each PVC inner casing well was pulled with a drill rig up to 10 feet out of well, cut 5 to 7-feet, sealed with Portland cement grout and pushed 2-feet below existing grade. All wells were sealed and allowed to settle.

Notes:

Gallon - gal

Grout - grt

Global Position System - GPS

Feet -ft

Diameter - Diam



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Project
McClellan
Project No.
06.094.000.066

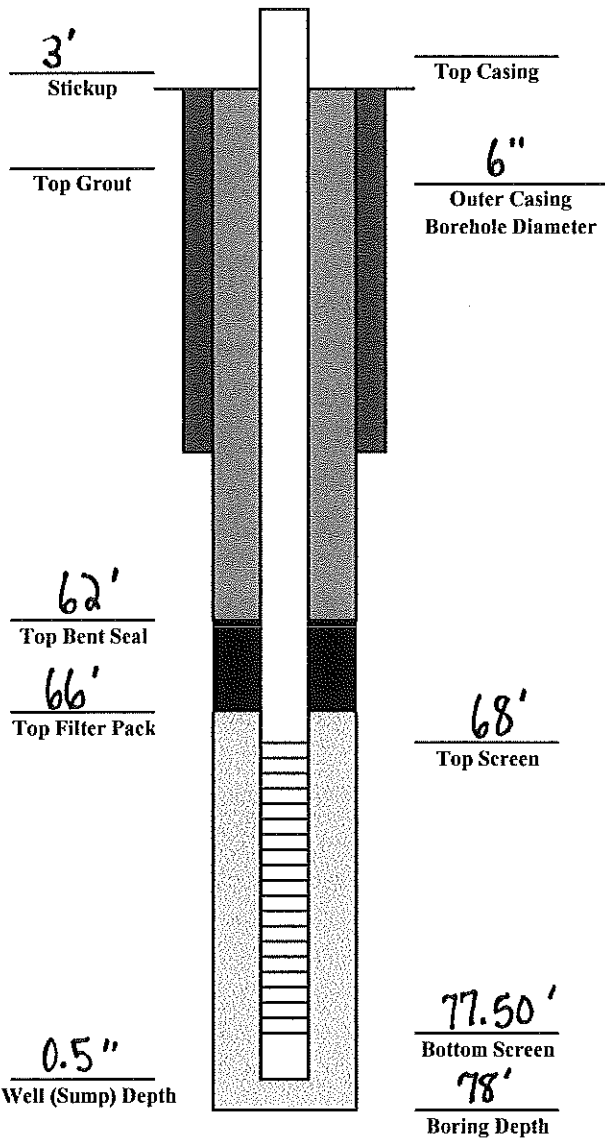
Well ID
PPMP-227-GP14
Location (Site)
GDAER

MONITORING WELL ABANDONMENT

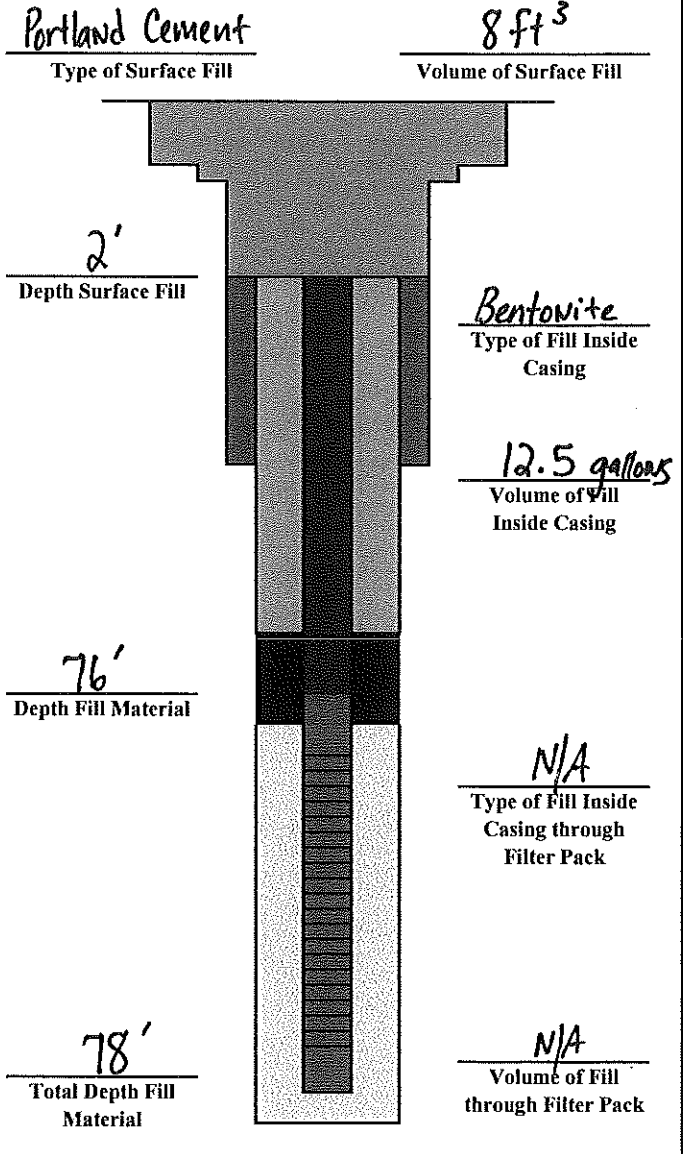
Abandoned By: **MES** Date: **7/14/2011** Well Type: **2" Stickup** Northing: **1181190.51** Easting: **673355.81**

Well Summary Prior to Abandonment

data presented in feet bgs



Well Summary After to Abandonment



notes:

	No	Yes	NA
Concrete Pad Removed		✓	
Protective Posts Removed		✓	
Flush Mount Removed			✓
Outer Casing Removed		✓	
Inner Casing Removed			✓
Length of Inner Casing Removed		10	feet