

Company Name Delta
 Project RAW only
 Site Name Maust



AMDTREAT

AMD TREAT

Costs AMD TREAT MAIN COST FORM

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond	1	0	\$63,761
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands	1	0	\$38,457
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$102,218
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching			\$0
Engineering Cost	1	0	\$10,722
Ancillary Subtotal:			\$15,722
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$117,940
<u>Annual Costs</u>			
Sampling	1	0	\$674
Labor	1	0	\$837
Maintenance	1	0	\$1,022
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$837
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$3,370
Other Cost			

Water Quality

Calculated Acidity mg/L
 Alkalinity mg/L

- Calculate Net Acidity (Acid-Alkalinity)
- Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm
 Typical Flow gpm
 Total Iron mg/L
 Aluminum mg/L
 Manganese mg/L
 pH su
 Ferric Iron mg/L
 Ferrous Iron mg/L
 Sulfate mg/L
 Filtered Fe mg/L
 Filtered Al mg/L
 Filtered Mn mg/L
 Specific Conductivity uS/cm
 Total Dissolved Solids mg/L
 Dissolved Oxygen mg/L

Total Annual Cost: per
 1000 Gal of H2O Treated \$0.256



AMDTREAT

AMD TREAT
VERTICAL FLOW POND (VFP)

VFP Name

Opening Screen Water Parameters

Influent Water Parameters that Affect VFP

Calculated Acidity mg/L
Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)
 Enter Net Acidity manually
Net Acidity (Hot Acidity) mg/L

Design Flow gpm
Typical Flow gpm
Total Iron mg/L
Aluminum mg/L
Manganese mg/L

Record Number

1 of 1

SIZING METHODS Select One

- | | | | | | |
|-----------------------------|------------------------------------|--|-------------------------------|------------------------------------|----------|
| 1. Tons of Limestone Needed | <input type="text" value="701"/> | <input type="radio"/> VFP Based on Acidity Neutralization | 6. Retention Time | <input type="text"/> | hours |
| 2. Tons of Limestone Needed | <input type="text" value="985"/> | <input type="radio"/> VFP Based on Retention Time | 7. Alkalinity Generation Rate | <input type="text"/> | g/m2/day |
| 3. Tons of Limestone Needed | <input type="text" value="3,274"/> | <input type="radio"/> VFP Based on Alkalinity Generation Rate | 8. Limestone Needed | <input type="text" value="1,686"/> | tons |
| 4. Tons of Limestone Needed | <input type="text" value="1,686"/> | <input checked="" type="radio"/> VFP Based on Tons Limestone Entered | 9. Length at Top of Freeboard | <input type="text"/> | ft |
| 5. Tons of Limestone Needed | <input type="text" value="1,921"/> | <input type="radio"/> VFP Based on Dimensions | 10. Width at Top of Freeboard | <input type="text"/> | ft |

11. % Void Space of LS. Bed %
12. System Life years
13. Limestone Purity %
14. Limestone Efficiency %
15. Density of Loose Limestone lbs/ft3
16. Limestone Unit Cost \$/ton
17. LS Placement Unit Cost \$/yd3
18. Slope of Pond Sides : Run of Slope Rise of Slope
19. Freeboard Depth ft
20. Free Standing Water Depth ft
21. Organic Matter Depth ft
22. Organic Matter Unit Cost \$/yd3
23. Organic Matter Spreading Unit Cost \$/yd3
24. Limestone Depth ft
25. Excavation Unit Cost \$/yd3

Liner Cost

- No Liner
- Clay Liner
11. Clay Liner Unit Cost \$/yd3
12. Thickness of Clay Liner ft
- Synthetic Liner
13. Synthetic Liner Unit Cost \$/yd2

29. Clearing and Grubbing?

- 30a. Land Multiplier ratio
- 30b. Clear/Grub Acres acres
31. Clear and Grub Unit Cost \$/acre
32. Nbr. of Valves nbr
33. Unit Cost of Valves \$ ea.

AMDTreat Piping Costs

34. Total Length of Effluent / Influent Pipe ft
35. Pipe Install Rate ft/hr
36. Labor Rate \$/hr
37. Segment Len. of Trunk Pipe ft/pipe seg.
38. Trunk Pipe Cost \$/ft
39. Trunk Coupler Cost \$/coupler
40. Spur Cost \$/ft
41. Spur Coupler Cost \$/spur
42. "T" Connector Cost \$/T coupler
43. Segment Len. of Spur Pipe ft/pipe seg.
44. Spur Pipe Spacing ft

Custom Piping Costs

- | | Length | Diameter | Unit Cost |
|-------------|-------------------------|-------------------------|-------------------------|
| 45. Pipe #1 | <input type="text"/> ft | <input type="text"/> in | <input type="text"/> \$ |
| 46. Pipe #2 | <input type="text"/> ft | <input type="text"/> in | <input type="text"/> \$ |
| 47. Pipe #3 | <input type="text"/> ft | <input type="text"/> in | <input type="text"/> \$ |

VFP Sizing Summaries

- | | | |
|--------------------------------|---------------------------------------|------|
| 48. Length at Top of Freeboard | <input type="text" value="177.53"/> | ft |
| 49. Width at Top of Freeboard | <input type="text" value="100.76"/> | ft |
| 50. Freeboard Volume | <input type="text" value="1,807"/> | yd3 |
| 51. Water Surface Area | <input type="text" value="14,694"/> | ft2 |
| 52. Total Water Volume | <input type="text" value="1,014"/> | yd3 |
| 53. Organic Matter Volume | <input type="text" value="453"/> | yd3 |
| 54. Limestone Surface Area | <input type="text" value="11,786"/> | ft2 |
| 55. Limestone Volume | <input type="text" value="1,161.43"/> | yd3 |
| 56. Excavation Volume | <input type="text" value="2,629.9"/> | yd3 |
| 57. Clear and Grub Area | <input type="text" value="0.0"/> | acr. |
| 58. Liner Area | <input type="text" value="0.0"/> | ft2 |
| 59. Theoretical Retention Time | <input type="text" value="27.36"/> | hrs |

VFP Cost Summaries

- | | | |
|---|-------------------------------------|----|
| 60. Organic Matter Cost | <input type="text" value="8,622"/> | \$ |
| 61. Limestone Cost | <input type="text" value="37,092"/> | \$ |
| 62. Limestone and Organic Matter Placement Cost | <input type="text" value="4,845"/> | \$ |
| 63. Excavation Cost | <input type="text" value="6,575"/> | \$ |
| 64. Liner Cost | <input type="text" value="0"/> | \$ |
| 65. Clear and Grub Cost | <input type="text" value="0"/> | \$ |
| 66. Valve Cost | <input type="text" value="0"/> | \$ |
| 67. Pipe Cost | <input type="text" value="6,627"/> | \$ |
| 68. Total Cost | <input type="text" value="63,761"/> | \$ |

Company Name

Project

Site Name



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AEROBIC WETLANDS

Aerobic Wetlands Name

Opening Screen Water Parameters

SIZING METHODS Select One

- Aerobic Wetland Based on Metal Removal Rates 1. Iron Removal Rate g/m2/day 2. Mn Removal Rate g/m2/day
- Aerobic Wetland Based on Dimensions 3. Top Length at Freeboard ft 4. Top Width at Freeboard ft
- Aerobic Wetland Based on Iron Oxidation Kinetics 5. Rate Constant moles/sec 6. Effluent Fe Concentration mg/l
- 7. Dissolved Oxygen mg/l 8. H2O Temperature °C

Influent Water Parameters that Affect Aerobic Wetlands

Calculated Acidity mg/L
 Alkalinity mg/L

- Calculate Net Acidity (Acid-Alkalinity)
- Enter Net Acidity manually
 Net Acidity (Hot Acidity) mg/L

Design Flow gpm
 Typical Flow gpm
 Total Iron mg/L
 Aluminum mg/L
 Manganese mg/L
 pH su

- 9. Length to Width Ratio Length : Width
- 10. Slope of Wetland Sides Run of Slope : Rise of Slope
- 11. Freeboard Depth ft
- 12. Free Standing Water Depth ft
- 13. Organic Matter Depth ft
- 14. Organic Matter Unit Cost \$/yd3
- 15. Organic Matter Spreading Unit Cost \$/yd3
- 16. Excavation Unit Cost \$/yd3
- 17. Wetland Planting Unit Cost \$/acre

- Liner Cost
- No Liner
 - Clay Liner
 18. Clay Liner Unit Cost \$/yd3
 19. Thickness of Clay Liner ft
 - Synthetic Liner
 20. Synthetic Liner Unit Cost \$/yd2

- 21. Clearing and Grubbing?
- 22. Land Multiplier ratio
- 23. Clear/Grub Acres acres
- 24. Clear and Grub Unit Cost \$/acre

Aerobic Wetland Sizing Summaries

25. Length at Top of Freeboard	200.00	ft
26. Width at Top of Freeboard	200.00	ft
27. Freeboard Volume	2,156	yd3
28. Water Surface Area	37,636	ft2
29. Water Volume	689	yd3
30. Organic Matter Volume	1,337	yd3
31. Excavation Volume	2,026	yd3
32. Clear and Grub Area	0.0	acres
33. Liner Area	0	ft2
34. Retention Time	46	hrs

Aerobic Cost Summaries

35. Organic Matter Cost	30,084	\$
36. Excavation Cost	5,067	\$
37. Liner Cost	0	\$
38. Clear and Grub Cost	0	\$
39. Wetland Planting Cost	3,306	\$
40. Total Cost	38,457	\$

Record Number 1 of 1

Company Name

Project

Site Name

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AMD TREAT

PONDS

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Pond Name

Pond Design Based On:

Retention Time

1. Desired Retention Time hours

2. Include Sludge Removal?

3. Sludge Removal Frequency times/year

4. Titration?

5. Sludge Rate gal sludge/
gal H2O

6. Percent Solids %

7. Sludge Density lbs./gal

Pond Size

8. Pond Length at Top of Freeboard ft

9. Pond Width at Top of Freeboard ft

10. Slope Ratio of Pond Sides Run : Rise

11. Freeboard Depth ft

12. Water Depth ft

13. Excavation Unit Cost \$/yd3

14. Total Length of Effluent / Influent Pipe ft

15. Unit Cost of Pipe \$/ft

Liner Cost

No Liner

Clay Liner

16. Clay Liner Unit Cost \$/yd3

17. Thickness of Clay Liner ft

Synthetic Liner

18. Synthetic Liner Unit Cost \$/yd2

19. Clearing and Grubbing?

20. Land Multiplier ratio

21. Clear/Grub Acres acres

22. Clear and Grub Unit Cost \$/acre

23. Revegetation Cost \$/acre

24. Number of Ponds for this Design number

25. Cost of Baffles \$

Calculated Pond Dimensions per Pond

26. Length at Top of Freeboard ft

27. Width at Top of Freeboard ft

28. Freeboard Volume yd3

29. Water Volume yd3

30. Estimated Annual Sludge yd3/yr

31. Volume of Sludge yd3/
per Removal

32. Excavation Volume acre ft

33. Excavation Volume yd3

34. Clear and Grub Area acres

35. Liner Area yd2

36. Calculated Retention Time hours

Ponds Sub-Totals per Pond

37. Excavation Cost \$

38. Pipe Cost \$

39. Liner Cost \$

40. Clearing and Grubbing Cost \$

41. Revegetation Cost \$

42. Baffle Cost \$

43. Estimated Cost \$

44. Accept Minimum Pond Cost?

The Recommended Minimum Construction Cost of Building a Pond is \$ 5,000

45. Recommended Minimum Cost \$

46. Total Cost \$

Opening Screen Water Parameters

Influent Water Parameters that Affect Ponds

Calculated Acidity mg/L

Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

Record Number
1 of 1

Company Name Delta
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AMD TREAT ENGINEERING COST

1. Capital Cost *	107,218	\$
☛ 2. Per Cent of Capital Cost	10.00	%
☛ 3. Actual Engineering Cost		\$
4. Total Engineering Cost	10,722	\$

* Total Capital Cost minus Engineering and
Land Access Capital Cost

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AMD TREAT SAMPLING

Sampling Name

Estimate Sampling Cost

- 1. Unit Labor Cost \$/hr
- 2. Collection Time per Sample hours/sample
- 3. Travel Time hr
- 4. Sample Frequency samples/mo
- 5. Lab Cost Per Sample \$/sample
- 6. Number of Sample Points points

Enter Established Annual Sampling Cost

- 7. Actual Annual Sampling Cost \$

Sampling Sub-Totals

- 8. Yearly Sample Analysis Cost \$
- 9. Yearly Travel Cost \$
- 10. Yearly Collection Cost \$

\$

Record Number 1 of 1

Company Name Delta
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LABOR

Labor Name

Estimate Labor Cost

- 1. Site Visits per Week
- 2. Site Labor Time per Visit hours
- 3. Travel Time per Visit hours
- 4. Unit Labor Cost \$/hour

Enter Established Annual Labor Cost

5. Actual Annual Labor Cost \$

6. Total Cost \$

Record Number 1 of 1

Company Name Delta
Project RAW only
Site Name Maust



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MAINTANENCE

Estimate Maintenance Cost

- 1. Percent of Active Cost %
- 2. Percent of Passive Cost %
- 3. Percent of Ancillary Cost * %
- 4. Percent of Other Capital Cost %

Enter Established Annual Maintenance Cost

5. Annual Maintenance Cost \$

Maintenance Sub-Totals

- 6 Total Maintenance Active Cost \$
- 7. Total Maintenance Passive Cost \$
- 8. Total Maintenance Ancillary Cost \$
- 9. Total Maintenance Other Capital Cost \$

10. Total Maintenance Cost \$

* Ancillary Cost does int include Cost for
Land Access and Engineering Cost

Company Name Delta
 Project RAW only
 Site Name Maust



AMDTREAT

**AMD TREAT
 SLUDGE REMOVAL**

Opening Screen
 Water Parameters

Sludge Removal Name

Influent Water Parameters that Affect Sludge Removal

Calculated Acidity mg/L

Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

Selection for Method of Removing Sludge

1. Select One

Sludge Removal by \$ per Gallon

2. Sludge Removal Unit Cost \$/gal

Sludge Removal by Vacuum Truck

3. Vacuum Truck Unit Cost \$/hr

4. Mobilization Cost \$

5. Hours to be Used hr

Sludge Removal by Mechanical Excavation

6. Mechanical Excavation Unit Rate \$/hr

7. Mobilization Cost \$

8. Hours to be Used hr

Sludge Removal by Lagoon Cleaner

9. Lagoon Cleaning Unit Rate \$/hr

10. Mobilization Cost \$

11. Hours to be Used hr

Actual Sludge Removal Cost

12. Actual Sludge Removal Cost \$

13. Off Site Disposal Cost \$

14. Iron Concentration mg/L

15. Manganese Concentration mg/L

16. Aluminum Concentration mg/L

17. Total Miscellaneous Concentration mg/L

18. Percent Solids %

19. Sludge Density lbs/gal

20 Titration?

21. Gal. of Sludge per Gal of Water Treated gal

22. Estimated Sludge Volume yd³/yr

Cost for Sludge Removal Types

23. Removal by \$ per Gallon \$

24. Removal by Vacuum Truck \$

25. Removal by Mechanical Excavation \$

26. Removal by Lagoon Cleaner \$

27. Actual Sludge Removal Cost \$

Sludge Removal Sub-Totals

28. Currently Selected Removal Cost Plus Off Site Disposal Cost \$

Company Name Delta
 Project RAW only
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AMD TREAT RECAPITIALIZATION COST

AMDTREAT

Calculation Period yrs Inflation Rate % Net Return Rate %

Recapitalization Name

A. Description of Item	B. Unit Cost Per Item	C. Quantity	D. Total Item Cost	E. Life Cycle	F. Number of Periods	G. Total PV
1. replace vfp	63,761	1	63,761	7	10	254,836
2. replace aerobic wetland	38,457	1	38,457	20	3	42,041
3. replace settling pond	5,000	1	5,000	20	3	5,466
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
13.	0	0	0	0	0	0
14.	0	0	0	0	0	0
15.	0	0	0	0	0	0
16.	0	0	0	0	0	0
17.	0	0	0	0	0	0
18.	0	0	0	0	0	0
19.	0	0	0	0	0	0
20.	0	0	0	0	0	0

Total Capital Cost \$ PV Grand Total \$

Company Name Delta
 Project OLDDH
 Site Name Maust



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Costs AMD TREAT MAIN COST FORM

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond	1	0	\$25,096
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands	1	0	\$13,524
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$38,620
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching			\$0
Engineering Cost	1	0	\$8,724
Ancillary Subtotal:			\$13,724
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$52,344
<u>Annual Costs</u>			
Sampling	1	0	\$674
Labor	1	0	\$837
Maintenance	1	0	\$386
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$191
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$2,088
Other Cost			

Water Quality

Calculated Acidity mg/L
 Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)
 Enter Net Acidity manually
 Net Acidity (Hot Acidity) mg/L

Design Flow gpm
 Typical Flow gpm
 Total Iron mg/L
 Aluminum mg/L
 Manganese mg/L
 pH su
 Ferric Iron mg/L
 Ferrous Iron mg/L
 Sulfate mg/L
 Filtered Fe mg/L
 Filtered Al mg/L
 Filtered Mn mg/L
 Specific Conductivity uS/cm
 Total Dissolved Solids mg/L
 Dissolved Oxygen mg/L

Total Annual Cost: per
 1000 Gal of H2O Treated \$0.397

Company Name

Project

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AMD TREAT VERTICAL FLOW POND (VFP)

AMDTREAT

VFP Name

Opening Screen Water Parameters

Influent Water Parameters that Affect VFP

Calculated Acidity

mg/L

Alkalinity

mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity)

mg/L

Design Flow

gpm

Typical Flow

gpm

Total Iron

mg/L

Aluminum

mg/L

Manganese

mg/L

Record Number

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SIZING METHODS Select One

- 1. Tons of Limestone Needed
- 2. Tons of Limestone Needed
- 3. Tons of Limestone Needed
- 4. Tons of Limestone Needed
- 5. Tons of Limestone Needed

VFP Based on Acidity Neutralization

VFP Based on Retention Time

VFP Based on Alkalinity Generation Rate

VFP Based on Tons Limestone Entered

VFP Based on Dimensions

6. Retention Time hours

7. Alkalinity Generation Rate g/m2/day

8. Limestone Needed tons

9. Length at Top of Freeboard ft

10. Width at Top of Freeboard ft

11. % Void Space of LS. Bed %

12. System Life years

13. Limestone Purity %

14. Limestone Efficiency %

15. Density of Loose Limestone lbs/ft3

16. Limestone Unit Cost \$/ton

17. LS Placement Unit Cost \$/yd3

Run of Slope Rise of Slope

18. Slope of Pond Sides :

19. Freeboard Depth ft

20. Free Standing Water Depth ft

21. Organic Matter Depth ft

22. Organic Matter Unit Cost \$/yd3

23. Organic Matter Spreading Unit Cost \$/yd3

24. Limestone Depth ft

25. Excavation Unit Cost \$/yd3

Liner Cost

No Liner

Clay Liner

11. Clay Liner Unit Cost \$/yd3

12. Thickness of Clay Liner ft

Synthetic Liner

13. Synthetic Liner Unit Cost \$/yd2

29. Clearing and Grubbing?

30a. Land Multiplier ratio

30b. Clear/Grub Acres acres

31. Clear and Grub Unit Cost \$/acre

32. Nbr. of Valves nbr

33. Unit Cost of Valves \$ ea.

AMDTreat Piping Costs

34. Total Length of Effluent / Influent Pipe ft

35. Pipe Install Rate ft/hr

36. Labor Rate \$/hr

37. Segment Len. of Trunk Pipe ft/pipe seg.

38. Trunk Pipe Cost \$/ft

39. Trunk Coupler Cost \$/coupler

40. Spur Cost \$/ft

41. Spur Coupler Cost \$/spur

42. "T" Connector Cost \$/T coupler

43. Segment Len. of Spur Pipe ft/pipe seg.

44. Spur Pipe Spacing ft

Custom Piping Costs

Length Diameter Unit Cost

45. Pipe #1 ft in \$

46. Pipe #2 ft in \$

47. Pipe #3 ft in \$

VFP Sizing Summaries

48. Length at Top of Freeboard ft

49. Width at Top of Freeboard ft

50. Freeboard Volume yd3

51. Water Surface Area ft2

52. Total Water Volume yd3

53. Organic Matter Volume yd3

54. Limestone Surface Area ft2

55. Limestone Volume yd3

56. Excavation Volume yd3

57. Clear and Grub Area acr.

58. Liner Area ft2

59. Theoretical Retention Time hrs

VFP Cost Summaries

60. Organic Matter Cost \$

61. Limestone Cost \$

62. Limestone and Organic Matter Placement Cost \$

63. Excavation Cost \$

64. Liner Cost \$

65. Clear and Grub Cost \$

66. Valve Cost \$

67. Pipe Cost \$

68. Total Cost \$

Company Name

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AMD TREAT

AEROBIC WETLANDS

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Aerobic Wetlands Name

Opening Screen Water Parameters

SIZING METHODS Select One

- Aerobic Wetland Based on Metal Removal Rates 1. Iron Removal Rate g/m2/day 2. Mn Removal Rate g/m2/day
- Aerobic Wetland Based on Dimensions 3. Top Length at Freeboard ft 4. Top Width at Freeboard ft
- Aerobic Wetland Based on Iron Oxidation Kinetics 5. Rate Constant moles/sec 6. Effluent Fe Concentration mg/l
- 7. Dissolved Oxygen mg/l 8. H2O Temperature °C

Influent Water Parameters that Affect Aerobic Wetlands

Calculated Acidity mg/L
 Alkalinity mg/L

- Calculate Net Acidity (Acid-Alkalinity)
- Enter Net Acidity manually
 Net Acidity (Hot Acidity) mg/L

Design Flow gpm
 Typical Flow gpm

Total Iron mg/L
 Aluminum mg/L
 Manganese mg/L
 pH su

- 9. Length to Width Ratio Length : Width
- 10. Slope of Wetland Sides Run of Slope : Rise of Slope
- 11. Freeboard Depth ft
- 12. Free Standing Water Depth ft
- 13. Organic Matter Depth ft
- 14. Organic Matter Unit Cost \$/yd3
- 15. Organic Matter Spreading Unit Cost \$/yd3
- 16. Excavation Unit Cost \$/yd3
- 17. Wetland Planting Unit Cost \$/acre

Liner Cost

- No Liner
- Clay Liner
 - 18. Clay Liner Unit Cost \$/yd3
 - 19. Thickness of Clay Liner ft
- Synthetic Liner
 - 20. Synthetic Liner Unit Cost \$/yd2

- 21. Clearing and Grubbing?
- 22. Land Multiplier ratio
- 23. Clear/Grub Acres acres
- 24. Clear and Grub Unit Cost \$/acre

Aerobic Wetland Sizing Summaries

25. Length at Top of Freeboard	150.00	ft
26. Width at Top of Freeboard	100.00	ft
27. Freeboard Volume	792	yd3
28. Water Surface Area	13,536	ft2
29. Water Volume	246	yd3
30. Organic Matter Volume	466	yd3
31. Excavation Volume	713	yd3
32. Clear and Grub Area	0.0	acres
33. Liner Area	0	ft2
34. Retention Time	41	hrs

Aerobic Cost Summaries

35. Organic Matter Cost	10,501	\$
36. Excavation Cost	1,783	\$
37. Liner Cost	0	\$
38. Clear and Grub Cost	0	\$
39. Wetland Planting Cost	1,240	\$
40. Total Cost	13,524	\$

Record Number 1 of 1

Company Name
Project
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AMD TREAT PONDS

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Pond Name

Pond Design Based On:

Retention Time

1. Desired Retention Time hours

2. Include Sludge Removal?

3. Sludge Removal Frequency times/year

4. Titration?

5. Sludge Rate gal sludge/
gal H2O

6. Percent Solids %

7. Sludge Density lbs./gal

Pond Size

8. Pond Length at Top of Freeboard ft

9. Pond Width at Top of Freeboard ft

Opening Screen
Water Parameters

**Influent Water
Parameters
that Affect
Ponds**

Calculated Acidity
 mg/L

Alkalinity
 mg/L

Calculate Net
Acidity
(Acid-Alkalinity)

Enter Net Acidity
manually

Net Acidity
(Hot Acidity)
 mg/L

Design Flow
 gpm

Typical Flow
 gpm

Total Iron
 mg/L

Aluminum
 mg/L

Manganese
 mg/L

**Record Number
1 of 1**

	Run	Rise
10. Slope Ratio of Pond Sides	<input type="text" value="2.0"/>	<input type="text" value="1"/>
11. Freeboard Depth	<input type="text" value="2.0"/>	ft
12. Water Depth	<input type="text" value="4.0"/>	ft
13. Excavation Unit Cost	<input type="text" value="2.50"/>	\$/yd3
14. Total Length of Effluent / Influent Pipe	<input type="text" value="0.20"/>	ft
15. Unit Cost of Pipe	<input type="text" value="7.90"/>	\$/ft

Liner Cost

No Liner

Clay Liner

16. Clay Liner Unit Cost \$/yd3

17. Thickness of Clay Liner ft

Synthetic Liner

18. Synthetic Liner Unit Cost \$/yd2

19. Clearing and Grubbing?

20. Land Multiplier ratio

21. Clear/Grub Acres acres

22. Clear and Grub Unit Cost \$/acre

23. Revegetation Cost \$/acre

24. Number of Ponds for this Design number

25. Cost of Baffles \$

Calculated Pond Dimensions per Pond

26. Length at Top of Freeboard ft

27. Width at Top of Freeboard ft

28. Freeboard Volume yd3

29. Water Volume yd3

30. Estimated Annual Sludge yd3/yr

31. Volume of Sludge yd3/
per Removal

32. Excavation Volume acre ft

33. Excavation Volume yd3

34. Clear and Grub Area acres

35. Liner Area yd2

36. Calculated Retention Time hours

Ponds Sub-Totals per Pond

37. Excavation Cost \$

38. Pipe Cost \$

39. Liner Cost \$

40. Clearing and Grubbing Cost \$

41. Revegetation Cost \$

42. Baffle Cost \$

43. Estimated Cost \$

44. Accept Minimum Pond Cost?

The Recommended Minimum Construction
Cost of Building a Pond is \$ 5,000

45. Recommended Minimum Cost \$

46. Total Cost \$

Company Name Delta
Project OLDDH
Site Name Maust

Printed on 03/20/2008

AMD TREAT ENGINEERING COST



AMD TREAT

1. Capital Cost * \$

2. Per Cent of Capital Cost %

3. Actual Engineering Cost \$

4. Total Engineering Cost \$

*** Total Capital Cost minus Engineering and
Land Access Capital Cost**

Company Name Delta
Project OLDDH
Site Name Maust

Printed on 03/20/2008

AMD TREAT SAMPLING



Sampling Name

Estimate Sampling Cost

- 1. Unit Labor Cost \$/hr
- 2. Collection Time per Sample hours/sample
- 3. Travel Time hr
- 4. Sample Frequency samples/mo
- 5. Lab Cost Per Sample \$/sample
- 6. Number of Sample Points points

Enter Established Annual Sampling Cost

- 7. Actual Annual Sampling Cost \$

Sampling Sub-Totals

- 8. Yearly Sample Analysis Cost \$
- 9. Yearly Travel Cost \$
- 10. Yearly Collection Cost \$

\$

Record Number 1 of 1

Company Name Delta
Project OLDDH
Site Name Maust

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AMDTREAT

AMD TREAT

LABOR

Labor Name

Estimate Labor Cost

1. Site Visits per Week

2. Site Labor Time per Visit hours

3. Travel Time per Visit hours

4. Unit Labor Cost \$/hour

Enter Established Annual Labor Cost

5. Actual Annual Labor Cost \$

6. Total Cost \$

Record Number 1 of 1

Company Name Delta
Project OLDDH
Site Name Maust



AMDTREAT

AMD TREAT MAINTENANCE

Estimate Maintenance Cost

- 1. Percent of Active Cost %
- 2. Percent of Passive Cost %
- 3. Percent of Ancillary Cost * %
- 4. Percent of Other Capital Cost %

Enter Established Annual Maintenance Cost

5. Annual Maintenance Cost \$

Maintenance Sub-Totals

- 6 Total Maintenance Active Cost \$
- 7. Total Maintenance Passive Cost \$
- 8. Total Maintenance Ancillary Cost \$
- 9. Total Maintenance Other Capital Cost \$
- 10. Total Maintenance Cost \$

* Ancillary Cost does not include Cost for Land Access and Engineering Cost

Company Name Delta
 Project OLDDH
 Site Name Maust



AMDTREAT

AMD TREAT SLUDGE REMOVAL

Opening Screen Water Parameters

Sludge Removal Name

Influent Water Parameters that Affect Sludge Removal

Calculated Acidity mg/L

Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

Selection for Method of Removing Sludge

1. Select One

Sludge Removal by \$ per Gallon

2. Sludge Removal Unit Cost \$/gal

Sludge Removal by Vacuum Truck

3. Vacuum Truck Unit Cost \$/hr

4. Mobilization Cost \$

5. Hours to be Used hr

Sludge Removal by Mechanical Excavation

6. Mechanical Excavation Unit Rate \$/hr

7. Mobilization Cost \$

8. Hours to be Used hr

Sludge Removal by Lagoon Cleaner

9. Lagoon Cleaning Unit Rate \$/hr

10. Mobilization Cost \$

11. Hours to be Used hr

Actual Sludge Removal Cost

12. Actual Sludge Removal Cost \$

13. Off Site Disposal Cost \$

14. Iron Concentration mg/L

15. Manganese Concentration mg/L

16. Aluminum Concentration mg/L

17. Total Miscellaneous Concentration mg/L

18. Percent Solids %

19. Sludge Density lbs/gal

20 Titration?

21. Gal. of Sludge per Gal of Water Treated

22. Estimated Sludge Volume yd³/yr

Cost for Sludge Removal Types

23. Removal by \$ per Gallon \$

24. Removal by Vacuum Truck \$

25. Removal by Mechanical Excavation \$

26. Removal by Lagoon Cleaner \$

27. Actual Sludge Removal Cost \$

Sludge Removal Sub-Totals

28. Currently Selected Removal Cost Plus Off Site Disposal Cost \$

Company Name Delta
 Project OLDDH
 Site Name Maust



AMD TREAT RECAPITIALIZATION COST

AMDTREAT

Calculation Period yrs Inflation Rate % Net Return Rate %

Recapitalization Name

A.	B.	C.	D.	E.	F.	G.
Description of Item	Unit Cost Per Item	Quantity	Total Item Cost	Life Cycle	Number of Periods	Total PV
1. replace fvp	25,096	1	25,096	7	10	100,302
2. replace aerobic wetland	13,524	1	13,524	20	3	14,784
3. replace settling pond	5,000	1	5,000	20	3	5,466
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
13.	0	0	0	0	0	0
14.	0	0	0	0	0	0
15.	0	0	0	0	0	0
16.	0	0	0	0	0	0
17.	0	0	0	0	0	0
18.	0	0	0	0	0	0
19.	0	0	0	0	0	0
20.	0	0	0	0	0	0

Total Capital Cost \$ PV Grand Total \$