

Company Name

Project **FRANK KOWALSKI**

Site Name **SP8**



**AMD TREAT**

**AMD TREAT MAIN COST FORM**

**AMDTREAT**

**Costs**

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond	1	0	\$13,851
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands			\$0
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
<b>Passive Subtotal:</b>			<b>\$13,851</b>
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
<b>Active Subtotal:</b>			<b>\$0</b>
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching	1	0	\$3,512
Engineering Cost	1	0	\$4,855
<b>Ancillary Subtotal:</b>			<b>\$13,367</b>
<b>Other Cost (Capital Cost)</b>			<b>\$10,000</b>
<b>Total Capital Cost:</b>			<b>\$37,218</b>
<u>Annual Costs</u>			
Sampling	1	0	\$718
Labor	1	0	\$1,820
Maintenance	1	0	\$1,133
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$213
<b>Other Cost (Annual Cost)</b>			<b>\$0</b>
<b>Land Access (Annual Cost)</b>			<b>\$0</b>
<b>Total Annual Cost:</b>			<b>\$3,884</b>
<b>Other Cost</b>	1	0	

**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

Typical Acid Loading  tons/yr

**Total Annual Cost: per  
 1000 Gal of H2O Treated \$0.369**

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### AMD TREAT VERTICAL FLOW POND (VFP)

**AMDTREAT**

VFP Name

Opening Screen Water Parameters

#### 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

#### 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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- 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 | <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  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  \$

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# AMD TREAT PONDS

AMDTREAT

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

Run Rise

10. Slope Ratio of Pond Sides  :

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. Cost of Baffles  \$

### Calculated Pond Dimensions per Pond

25. Length at Top of Freeboard  ft

26. Width at Top of Freeboard  ft

27. Freeboard Volume  yd3

28. Water Volume  yd3

29. Estimated Annual Sludge  yd3/yr

30. Volume of Sludge  
per Removal  yd3/  
removal

31. Excavation Volume  acre ft

32. Excavation Volume  yd3

33. Clear and Grub Area  acres

34. Liner Area  yd2

35. Calculated Retention Time  hours

### Ponds Sub-Totals per Pond

36. Excavation Cost  \$

37. Pipe Cost  \$

38. Liner Cost  \$

39. Clearing and Grubbing Cost  \$

40. Revegetation Cost  \$

41. Baffle Cost  \$

42. Estimated Cost  \$

43. Accept Minimum Pond Cost?

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

44. Recommended Minimum Cost  \$

45. 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

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# AMD TREAT DITCHING



**AMDTREAT**

Ditching Name

- 1. Ditch Length Rock  ft
- 2. Ditch Length Grass  ft
- 3. Bottom Width of Ditch  ft
- 4. Ditch Depth  ft
- 5. Geo Textile Unit Cost  \$/yd2
- 6. Length of Geo Textile  ft
- 7. Slope Ratio of Ditch Sides 

Run		Rise
<input type="text" value="2.00"/>	:	<input type="text" value="1.00"/>
- 8. Surveying?
- 9. Survey Rate  acres/day
- 10. Survey Unit Cost  \$/day
- 11. Clearing and Grubbing?
- 12. Clear and Grub Cost  \$/acre

- 13. Ditch Depth of Rock  ft
- 14. Cost of Ditch Surface Rock  \$/yd3
- 15. Cost to Place Rock  \$/yd3
- 16. Excavation Unit Cost  \$/yd3
- 17. Length of Silt Fence  ft
- 18. Unit Cost of Silt Fence  \$/ft
- 19. Revegetation Unit Cost  \$/acre

### Ditching Sub-Totals

- 20. Excavation Cost  \$
- 21. Survey Cost  \$
- 22. Clear and Grub Cost  \$
- 23. Aggregate Cost  \$
- 24. Filter Fabric Cost  \$
- 25. Silt Fence Cost  \$
- 26. Revegetation Cost  \$

**Record Number 1 of 1**

**27. Total Cost  \$**

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**AMDTREAT**

**AMD TREAT  
ENGINEERING COST**

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**

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**AMDTREAT**

**AMD TREAT  
OTHER COST**

Other Cost Name Stream crossing

A. Description of Item	B. Unit Cost Per Item	C. Quantity	D. Total Item Cost	E. Capital Cost Annual Cost
1. 2 36" CMP stream crossing	10,000.00	1	10,000	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
2.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
3.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
4.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
5.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
6.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
7.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
8.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
9.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
10.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
11.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
12.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
13.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
14.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost
15.	0.00	0	0	<input checked="" type="checkbox"/> Capital Cost <input type="checkbox"/> Annual Cost

**Record Number**  
1 of 1

Current Capital Cost  \$  
Current Annual Cost  \$

Total Capital Cost  \$  
Total Annual Cost  \$

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## AMD TREAT SAMPLING



Sampling Name FRANK KOWALSKI SP8 4--RAW,DICHARGE,UP AND DOWN

**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  \$

11. Sampling Cost  \$

Record Number 1 of 1

Company Name

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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



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**AMDTREAT**

## AMD TREAT

### 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

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**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

1. **Select One** Selection for Method of Removing Sludge

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  \$

**Concentrations from Main Water Quality Screen**

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

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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. VERTICAL FLOW POND	13,851	1	13,851	7	10	55,359
2. POND	5,000	1	5,000	20	3	5,466
3. 2x36" CMP stream crossing	10,000	1	10,000	25	3	8,745
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  \$