

Company Name Delta Penn Corp  
 Project SMP#65830202  
 Site Name Hostetter Refuse Pile



**AMD TREAT**  
**AMD TREAT MAIN COST FORM**

AMDTREAT

**Costs**

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond			\$0
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands			\$0
Manganese Removal Bed			\$0
Oxic Limestone Channel	1	0	\$3,701
Limestone Bed			\$0
BIO Reactor			\$0
<b>Passive Subtotal:</b>			<b>\$3,701</b>
<u>Active Treatment</u>			
Caustic Soda	1	0	\$9,812
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
<b>Active Subtotal:</b>			<b>9,812.00</b>
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching	1	0	\$5,485
Engineering Cost	1	0	\$2,400
<b>Ancillary Subtotal:</b>			<b>\$12,885</b>
Other Cost (Capital Cost)			\$0
<b>Total Capital Cost:</b>			<b>\$26,398</b>
<u>Annual Costs</u>			
Sampling	2	0	\$1,432
Labor	1	0	\$21,840
Maintenance	1	0	\$840
Pumping			\$0
Chemical Cost	1	0	\$11,165
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$1,236
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
<b>Total Annual Cost:</b>			<b>\$36,513</b>
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 \$13.884**

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### AMD TREAT

### Oxic Limestone Channel (OLC)

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Oxic Limestone Channel Name Open Limestone Channel

- 1. Ditch Length Rock  ft
- 2. Bottom Width of the Ditch  ft
- 3. Ditch Depth  ft
- 4. Geo Textile Unit Cost  \$/yd<sup>2</sup>
- 5. Length of GeoTextile  ft
- 6. Slope Ratio of Ditch Sides 

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

- 12. Ditch Depth of Limestone  ft
- 13. Cost of Limestone  \$/yd<sup>3</sup>
- 14. Cost to Place Limestone  \$/yd<sup>3</sup>
- 15. Excavation Unit Cost  \$/yd<sup>3</sup>
- 16. Revegetation Unit Cost  \$/acre

#### OLC Sub-Totals

- 17. Excavation Cost  \$
- 18. Survey Cost  \$
- 19. Clear and Grub Cost  \$
- 20. Limestone Cost  \$
- 21. Filter Fabric Cost  \$
- 22. Revegetation Cost  \$

23. Total Cost  \$

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AMDTREAT

## AMD TREAT CAUSTIC SODA

**Opening Screen Water Parameters**

Caustic Soda Name Caustic Treatment System

**Influent Water Parameters that Affect Caustic Soda**

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. Gallons of Caustic per Year  gal/yr  
 2. Gallons of Caustic per Month  gal/mo  
 3. Gallons of Caustic per Day  gal/day

4. Titration?

5. Caustic Titration Volume  gal caustic/gal water treated  
 6. Purity of Caustic Solution  purity of 20% caustic solution  
 7. Mixing Efficiency of Caustic Solution  %  
 8. Tank Cost  \$  
 9. Tank Volume  gal  
 10. Delivery Frequency  times/yr  
 11. Valve Unit Cost  \$  
 12. Number of Valves  nbr  
 13. Feeder Line Length  ft  
 14. Feeder Line Unit Cost  \$/ft  
 15. Installation of System Unit Cost  \$/hr  
 16. Installation Hours  hours

17. Automatic System?

18. PID pH Proportional Control  \$  
 19. pH Probe  \$  
 20. Chemical Metering Pump  \$  
 21. Water Wheel Dispenser  
 22. Dispenser Cost  \$

**Caustic Sub-Totals**

23. Number of Tanks Required  nbr  
 24. Tank Cost  \$  
 25. Automatic System or Wheel Dispenser Cost  \$  
 26. Cost of Valves  \$  
 27. Feeder Line Cost  \$  
 28. Labor Cost  \$

29. Total Capital Cost  \$

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# AMD TREAT PONDS

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Pond Name Settling Pond

### 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. 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

5. 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

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### AMD TREAT DITCHING



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Ditching Name Collection Trench

- 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="1.50"/>	<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  \$

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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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## AMD TREAT SAMPLING



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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  \$

11. Sampling Cost  \$

Record Number 1 of 2

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AMDTREAT

## 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  \$

11. Sampling Cost  \$

Record Number 2 of 2



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## 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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## 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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## AMD TREAT CHEMICAL COST

**AMDTREAT**

Chemical Cost Name: caustic

**Opening Screen Water Parameters**

**Influent Water Parameters that Affect Chemical Cost**

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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**A. Hydrated Lime ?**

1 Titration?

2. Hydrated Lime Titration Amount  lbs of hydrated lime / gal of H2O

3. Hydrated Lime Purity  %

4. Mixing Efficiency of Hydrated Lime  %

5. Hydrated Lime Unit Cost  \$/lb

**B. Pebble Quick Lime ?**

6. Titration?

7. Pebble Lime Titration Amount  lbs of Pebble Lime / gal of H2O

8. Pebble Lime Purity  %

9. Mixing Efficiency of Pebble Lime  %

Delivered in Bags

10. Pebble Lime Bag Unit Cost  \$/lb

Bulk Delivery

11. Pebble Lime Bulk Unit Cost  \$/lb

**C. Caustic Soda ?**

12. Titration?

13. Caustic Titration Amount  gal of caustic / gal H2O

14. Caustic Purity  purity of 20% caustic solution

15. Mixing Efficiency of Caustic  %

Non-Bulk Delivery

16. Caustic Non-Bulk Unit Cost  \$/gal

Bulk Delivery

17. Caustic Bulk Unit Cost  \$/gal

**D. Limestone ?**

18. Limestone Purity  %

19. Limestone Efficiency  %

20. Limestone Unit Cost  \$/ton

**E. Anhydrous Ammonia ?**

21. Titration?

22. Ammonia Titration Amount  lbs of ammonia / gal H2O

23. Ammonia Purity  %

24. Mixing Efficiency of Ammonia  %

Non-Bulk Delivery

25. Ammonia Non-Bulk Unit Cost  \$/lb

Bulk Delivery

26. Ammonia Bulk Unit Cost  \$/lb

**F. Soda Ash ?**

27. Titration?

28. Soda Ash Titration Amount  lbs of soda ash / gal of H2O

29. Soda Ash Purity  %

30. Mixing Efficiency of Soda Ash  %

31. Soda Ash Unit Cost  \$/lb

**G. Known Chemical Cost ?**

32. Known Annual Chemical Cost  \$

Chemical Cost Sub-Totals	Annual Amount of Chemicals Consumed
33. Total Hydrated Lime Cost <input type="text" value="0"/> \$	<input type="text" value="0"/> lbs
34. Total Pebble Lime Cost <input type="text" value="0"/> \$	<input type="text" value="0"/> lbs
35. Total Caustic Soda Cost <input type="text" value="11,165"/> \$	<input type="text" value="22,329"/> gals
36. Total Limestone Cost <input type="text" value="0"/> \$	<input type="text" value="0"/> tons
37. Total Anhydrous Ammonia Cost <input type="text" value="0"/> \$	<input type="text" value="0"/> lbs
38. Total Soda Ash Cost <input type="text" value="0"/> \$	<input type="text" value="0"/> lbs
39. Total Known Chemical Cost <input type="text" value="0"/> \$	

40. Selected Chemical: **CAUSTIC SODA**

Annual Chemical 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  \$

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. Oxid Limestone Channel	3,700	1	3,700	15	5	6,275
2. Settling Pond	5,000	1	5,000	15	5	8,479
3.	0	0	0	0	0	0
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  \$