

Company Name Arthur Brooks

Project MP 9 A

Site Name Arthur Brooks (Honsaker)



AMDTREAT

AMD TREAT

Costs AMD TREAT MAIN COST FORM

<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	1	0	\$2,404
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$2,404
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime	1	0	\$32,239
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	1	0	\$512
Engineering Cost	1	0	\$4,116
Ancillary Subtotal:			\$9,628
Other Cost (Capital Cost)			\$1,000
Total Capital Cost:			\$45,271
<u>Annual Costs</u>			
Sampling	1	0	\$1,736
Labor	1	0	\$3,640
Maintenance	1	0	\$1,440
Pumping			\$0
Chemical Cost	1	0	\$314
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$333
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$7,463
Other Cost	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

**Total Annual Cost: per
 1000 Gal of H2O Treated \$7.094**

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AMDTREAT

AMD TREAT MANGANESE REMOVAL BED

MN Removal Bed Name

SIZING METHODS **Select One**

Tons of Limestone Needed	147.85	<input checked="" type="radio"/> Based on Retention Time
Tons of Limestone Needed	200.00	<input type="radio"/> Based on Tons of Limestone
Tons of Limestone Needed	919.45	<input type="radio"/> Based on Dimensions
Tons of Limestone Needed	0.00	<input type="radio"/> Based on Kinetics

1. Retention Time	1.00	days
2. Limestone Needed		tons
3. Length at Top of Freeboard		ft
4. Width at Top of Freeboard		ft
5. Rate Constant (k)		hr/ft

Opening Screen Water Parameters

Influent Water Parameters that Affect MN Removal Bed

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

6. Stone Diameter	1.00	inches
7. Effluent Mn Concentration	5.00	mg/l
8. % Void Space of Limestone Bed	35.00	%
9. Density of Loose Limestone	107.53	lbs/ft3
10. Limestone Unit Cost	12.00	\$/ton
11. Limestone Placement Unit Cost	0.00	\$/yd3
12. Freeboard Depth	2.00	ft
13. Limestone Depth	1.00	ft
14. Excavation Unit Cost	4.50	\$/yd3
15. Slope of Pond Sides	2.0	Run : <input style="width: 30px;" type="text" value="1"/> Rise

Liner Cost

<input checked="" type="radio"/> No Liner		
<input type="radio"/> Clay Liner		
16. Clay Liner Unit Cost		\$/yd3
17. Thickness of Clay Liner		ft
<input type="radio"/> Synthetic Liner		
18. Synthetic Liner Unit Cost		\$/yd2

19. Clearing and Grubbing?

20. Land Multiplier	1.50	ratio
21. Clear/Grub Acres		acres
22. Clear and Grub Unit Cost	1256.00	\$/acre

Manganese Removal Bed Sizing Summaries

23. Top Length at Freeboard	85.15	ft
23. Top Width at Freeboard	46.57	ft
25. Freeboard Volume	256	yd3
26. Limestone Surface Area	2,976.1	ft2
27. Limestone Volume	101.8	yd3
28. Tons of Limestone	147	tons
29. Excavation Volume	101	yd3
30. Clear and Grub Area	0.1	acres
31. Liner Area	0	ft2
32. Theoretical Retention Time	1.00	days

Manganese Removal Bed Sub-Totals

33. Limestone Cost	1,774	\$
34. Limestone Placement Cost	0	\$
35. Excavation Cost	458	\$
36. Liner Cost	0	\$
37. Clear and Grub Cost	172	\$

38. Total Cost \$

Record Number 1 of 1

Company Name Arthur Brooks

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Project MP 9

Site Name Arthur Brooks (Honsaker)

AMD TREAT PEBBLE QUICK LIME



AMDTREAT

Pebble Quick Lime Name:

**Opening Screen
Water Parameters**

Influent Water Parameters that Affect Pebble Quick Lime

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

- 1. Annual Pebble Quick Lime tons/yr
- 2. Pebble Quick Lime 50 Lbs Bags per day
- 3. Pounds per Hour of Pebble Quick Lime lbs/hr
- 4. Refill Frequency for 1 Ton Bin days
- 5. Refill Frequency for 35 Ton Silo days
- 6. Purity of Pebble Quick Lime %
- 7. Mixing Efficiency of Pebble Quick Lime %
- 8. Titration?
- 9. Pebble Quick Lime Titration Amount lbs of Pebble Lime /gal of H2O
- 10. Excavation Unit Cost \$/yd3
- 11. Aggregate Unit Cost \$/yd3
- 12. Aggregate Placement Unit Cost \$/yd3

13. Ditching System

Default Ditching System Based on Flow

- 14. Default Ditch Length ft
- 15. Default Ditch Bottom Width ft
- 16. Default Ditch Depth ft

Custom Ditching System

- 17. Ditch Length ft
- 18. Ditch Bottom Width ft
- 19. Ditch Depth ft

Run : Rise

- 20. Slope Ratio of Ditch Sides :
- 21. Rock Depth in Ditch ft
- 22. Length of Rock Lined Ditch ft

23. Clearing and Grubbing?

- 24a. Land Multiplier ratio
- 24b. Clear/Grub Acres acres
- 25. Clear and Grub Cost \$/acre

26. Select One Delivery System

- 1 Ton Bin System \$
- 35 Ton Silo System \$

27. Electric Mixer ?

28. Electric Mixer System Cost \$

29. Slaker ?

30. Slaker Cost \$

Pebble Quick Lime Sub-Totals

- 31. Clear Grub Area acres
- 32. Storage System Cost \$
- 33. Electric Mixer Cost \$
- 34. Aggregate Cost \$
- 35. Ditch Excavation Cost \$
- 36. Clear and Grub Cost \$
- 37. Slaker Cost \$

38. Total Cost \$

Company Name Arthur Brooks

Printed on 08/21/2007

Project MP 9

Site Name Arthur Brooks (Honsaker)



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. 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
per Removal yd3/
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

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Company Name Arthur Brooks

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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
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 \$

Company Name Arthur Brooks

Printed on 05/19/2008

Project MP 9

Site Name Arthur Brooks (Honsaker)



AMD TREAT

**AMD TREAT
ENGINEERING COST**

1. Capital Cost *	41,155	\$
<input checked="" type="radio"/> 2. Per Cent of Capital Cost	10.00	%
<input type="radio"/> 3. Actual Engineering Cost		\$

4. Total Engineering Cost 4,116 \$

* Total Capital Cost minus Engineering and Land Access Capital Cost

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AMDTREAT

**AMD TREAT
OTHER COST**

Other Cost Name

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

Record Number
1 of 1

Curent Capital Cost \$
Current Annual Cost \$

Total Capital Cost \$
Total Annual Cost \$

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AMD TREAT SAMPLING

AMDTREAT

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 1

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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 Arthur Brooks

Project MP 9

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AMD TREAT

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

Company Name Arthur Brooks

Project MP 9

Site Name Arthur Brooks (Honsaker)



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

Record Number 1 of 1

Company Name Arthur Brooks

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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. MN Removal Bed Replacement	2,404	1	2,404	15	5	4,077
2. Misc for Hydrated Lime components	1,000	1	1,000	25	3	875
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 \$

Company Name Arthur Brooks
 Project MP4
 Site Name Arthur Brooks Honsaker



AMD TREAT

Costs AMD TREAT MAIN COST FORM

AMDTREAT

<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	\$868
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$868
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash	1	0	\$500
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching	1	0	\$512
Engineering Cost	1	0	\$688
Ancillary Subtotal:			\$6,200
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$7,568
<u>Annual Costs</u>			
Sampling	1	0	\$1,736
Labor	1	0	\$4,095
Maintenance	1	0	\$241
Pumping			\$0
Chemical Cost	1	0	\$104
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$13
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$6,189
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 \$11.767

Company Name Arthur Brooks

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Project MP4

Site Name Arthur Brooks Honsaker



AMD TREAT

Oxic Limestone Channel (OLC)

AMDTREAT

Oxic Limestone Channel Name

- 1. Ditch Length Rock ft
- 2. Bottom Width of the Ditch ft
- 3. Ditch Depth ft
- 4. Geo Textile Unit Cost \$/yd2
- 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 \$/yd3
- 14. Cost to Place Limestone \$/yd3
- 15. Excavation Unit Cost \$/yd3
- 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 \$

Record Number 1 of 1

Company Name Arthur Brooks

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Project MP4

Site Name Arthur Brooks Honsaker

AMD TREAT

SODA ASH



AMDTREAT

1. Soda Ash Dispenser Cost \$

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Project MP4

Site Name Arthur Brooks Honsaker



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. 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
per Removal yd3/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 Arthur Brooks

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Project MP4

Site Name Arthur Brooks Honsaker

AMD TREAT DITCHING



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

Record Number 1 of 1

- 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 \$

27. Total Cost \$

Company Name Arthur Brooks

Printed on 08/21/2007

Project MP4

Site Name Arthur Brooks Honsaker

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

Record Number 1 of 1

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 \$

27. Total Cost \$

Company Name Arthur Brooks

Printed on 08/21/2007

Project MP4

Site Name Arthur Brooks Honsaker



AMDTREAT

AMD TREAT
ENGINEERING COST

1. Capital Cost *	6,880	\$
2. Per Cent of Capital Cost	10.00	%
3. Actual Engineering Cost		\$

4. Total Engineering Cost 688 \$

* Total Capital Cost minus Engineering and Land Access Capital Cost

Company Name Arthur Brooks

Printed on 08/21/2007

Project MP4

Site Name Arthur Brooks Honsaker



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 1 of 1

Company Name Arthur Brooks

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Project MP4

Site Name Arthur Brooks Honsaker



AMD TREAT

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 Arthur Brooks
Project MP4
Site Name Arthur Brooks Honsaker



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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Printed on 08/21/2007

Project MP4

Site Name Arthur Brooks Honsaker



AMD TREAT CHEMICAL COST

AMDTREAT

Chemical Cost Name:

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

1 of 1

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

33. Total Hydrated Lime Cost \$

34. Total Pebble Lime Cost \$

35. Total Caustic Soda Cost \$

36. Total Limestone Cost \$

37. Total Anhydrous Ammonia Cost \$

38. Total Soda Ash Cost \$

39. Total Known Chemical Cost \$

Annual Amount of Chemicals Consumed

lbs

lbs

gals

tons

lbs

lbs

40. Selected Chemical: **SODA ASH**

Annual Chemical Cost \$

Company Name Arthur Brooks
 Project MP4
 Site Name Arthur Brooks Honsaker



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 \$

Company Name Arthur Brooks

Project MP4

Site Name Arthur Brooks Honsaker



AMD TREAT RECAPITALIZATION 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 Limestone in LS Channel	18	25	450	15	5	763
2.	0	0	0	0	0	0
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 \$