5 Fuel Production Facilities Description and Costs

This section provides a description of the Newport RDF facility and a C&D processing facility that could be constructed. Each facility description is followed by estimated capital and operating costs and, for Newport, the estimated expansion costs to add a third and fourth line to the existing facility.

5.1 Newport Facility

5.1.1 Site Description

The current processing facility is a 129,000 square foot building on a 14-acre parcel of land. The facility was originally constructed in 1986-87. The site includes inbound and outbound lanes with scales adjacent to a scalehouse; trailer parking areas; a 64,000 square foot (approximate) receiving building/tipping floor; a bulky waste residue loadout; processing building; administration building; service center; dust collection facilities; recyclables loadout; and residue and RDF loadout areas. A site layout is provided in Figure 5-1.

The current equipment at the Newport facility can process approximately 1,700 to 2,000 tons per day of MSW into RDF. If the additional processing lines are added, production capacity would increase by 100 percent (although 100 percent capacity is seldom used). The addition of up to two processing lines is discussed in Section 5.1.5.

5.1.2 Newport Facility Operating Cost and Purchase Costs

5.1.2.1 Operating Costs

Operating costs for the Newport Facility were originally estimated by Foth & Van Dyke in 1998 based on information provided by NRG and business assumptions made where cost data were not provided or were not available. The general categories for the cost analysis in 1998 included:

- Labor
- NRG overhead allowance
- Site maintenance
- Building maintenance
- Fuel processing equipment O&M/replacement
- Mobile processing equipment
- Electricity
- Natural gas allowance
- Telephone, water, sewer
- Fire/explosion suppression
- Insurance allowance
- Utility contingency
- RDF hauling
- Landfilling costs
- Hazardous waste handling

- Property taxes
- NRG/NSP contract

In order to provide a comparison for the 1998 study, the following costs are placed in the same general categories with 1998 estimates provided as reference. Costs were provided by Gary White at NRG and other sources were used as needed.

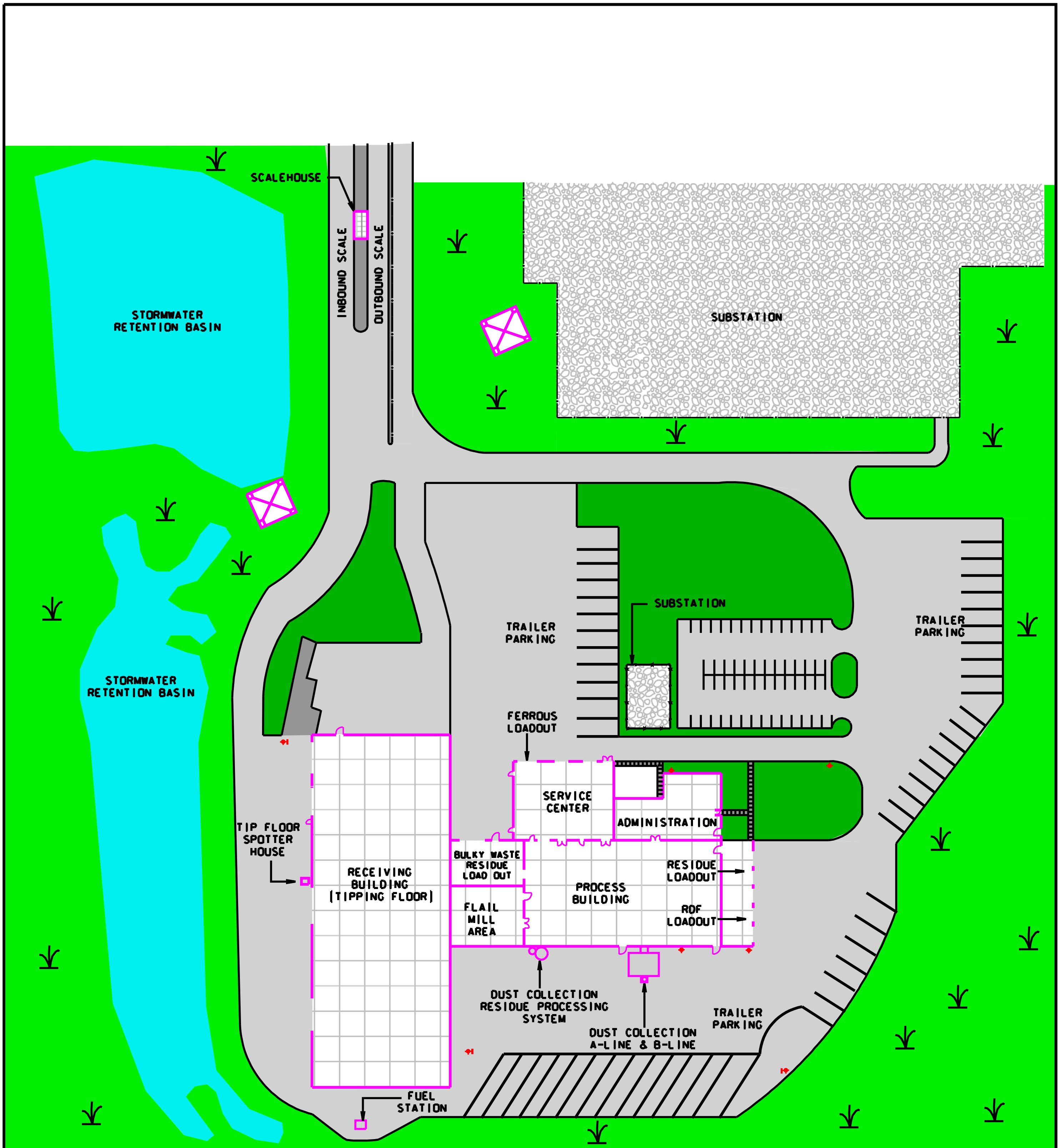
5.1.2.1.1 Labor

The 1998 study provided labor categories that included scale operations, administration, shift supervisors, traffic director, loader operator, grapple operator, yard tractors, control room, process line, maintenance, helpers, and contingency. This analysis simplifies the labor structure to include scale operators, supervisors, processors, mechanics, electricians, helpers, laborers, and administration. Estimated costs for the 2006 labor categories follow.

5.1.2.1.1.1 Scale Operators

Scale operators have not changed noticeably since the 1998 study. Scale operations occur Monday through Friday for 32 man-hours per day and Saturday and Sunday for 24 man-hours per day. Total scale operator time per week is estimated to be 208 hours per week. Additionally, 24 hours per week were estimated for vacations, sick leave, overtime, etc. Total weekly man-hours was estimated to be 232 hours. With 52 weeks per year, this equates to a total scale operator usage of 12,064 hours per year.

In 1998, a salary rate of $23.00 per hour was used for scale operator costs, including fringe benefits. If this cost is inflated at 3 percent per year, the 2006 salary rate is estimated to be $29.13 per hour. Therefore, scale operator costs in 2006 are estimated to be $351,424.



NOTE:
FROM OSM & ASSOCIATES

NRG NEWPORT FACILITY

FIGURE 5-1
SITE LAYOUT

Foth & Van Dyke
engineers · architects · scientists

NOT TO SCALE

Date: APR. 2006 | By: CKV

5.1.2.1.1.2 Administration

Administration costs estimated in 1998 included a plant manager, purchaser, payroll, transportation, office administrator, and an assistant. Total annual administration costs estimated in 1998 were $370,000, including fringe benefits. In discussions with Gary White, administration positions have remained unchanged since 1998 except the 1998 payroll position is now accounts payable and the 1998 assistant position is now a payroll position.

To estimate 2006 administration costs, the 1998 total cost was inflated at 3 percent per year. Thus, in 2006, the estimated administration costs are $468,705.

5.1.2.1.1.3 NRG Processing Staff

In the 1998 study, several staff members were identified as being part of shift work at the Newport Facility. These positions included traffic director, loader operator, grapple operator, yard tractor operators, control room operators, and process line operators. In 1998, these positions were estimated to cost $1,060,000. In discussions with Gary White for this analysis, the positions for shift work are simplified. For each processing shift there are:

- 12 processors
- 2 mechanics
- 1 electrician
- 2 helpers

There are two 10-hour shifts Monday through Friday and one 10-hour shift Saturday and Sunday. Additionally, there are two contract laborers Monday through Friday for 12 hours per day that are certified in asbestos handling and disposal. Labor rates for the positions are estimated based on actual hourly rates provided by NRG that were increased by 40 percent to include fringe benefits.

<u>Processors</u>

12 processors/shift x 2 shifts/day x 10 hours/shift x 5 days/week x $38.00/hour	=	$45,600
12 processors/shift x 1 shift/day x 10 hours/shift x 2 days/week x $38.00/hour	=	$9,120
$/week	=	$54,720
$/year	=	$2,845,440

<u>Mechanics</u>

2 mechanics/shift x 2 shifts/day x 10 hours/shift x 5 days/week x $39.90/hour	=	$7,980
2 mechanics/shift x 1 shift/day x 10 hours/shift x 2 days/week x $39.90/hour	=	$1,596
$/week	=	$9,576
$/year	=	$497,952

<u>Electrician</u>

1 electrician/shift x 2 shifts/day x 10 hours/shift x 5 days/week x $39.90/hour	=	$3,990
1 electrician/shift x 1 shift/day x 10 hours/shift x 2 days/week x $39.90/hour	=	$798
$/week	=	$4,788
$/year	=	$248,976

Helpers

2 helpers/shift x 2 shifts/day x 10 hours/shift x 5 days/week x $25.00/hour	=	$5,000
2 helpers/shift x 1 shift/day x 10 hours/shift x 2 days/week x $25.00/hour	=	$1,000
$/week	=	$6,000
$/year	=	$312,000

Contract Laborer

1 laborer/shift x 2 shifts/day x 10 hours/shift x 5 days/week x $35.19/hour	=	$3,519
$/week	=	$3,519
$/year	=	$182,988

Total annual labor costs for processing is estimated to be $4,087,356.

5.1.2.1.1.4 Maintenance Staff

In the 1998 study, annual maintenance costs were estimated to be $635,000. In 2006, in discussions with Gary White, maintenance staff includes one supervisor and three mechanics working Sunday through Thursday, 8-hour shifts. Additionally, contract labor for maintenance includes eight laborers and two iron workers working an 8-hour shift Sunday through Thursday. The laborers (and the asbestos laborers) are contracted through the Laborers International Union of North America (LIUNA) Construction and General Laborers Local No. 132. In discussions with LIUNA, the following rates are charged for the position at Newport (including benefits):

- Laborer: $36.79/hour
- Asbestos workers: $35.19/hour

For the iron workers labor rate, Iron Workers Local No. 512 was contacted. The estimated labor rate for an iron worker (including benefits) is $46.94 per hour.

Supervisor's compensation in the 1998 study was estimated to be 25 percent higher than a processor's pay. Therefore, in 2006, an estimated hourly rate for a supervisor is $47.50.

The total annual costs for maintenance staff are:

1 supervisor x 40 hours/week x $47.50/hour	=	$1,800/week
3 mechanics x 40 hours/week x $39.90/hour	=	$4,788/week
8 laborers x 40 hours/week x $36.79/hour	=	$11,772.80/week
2 iron workers x 40 hours/week x $47.50/hour	=	$3,800.00/week
Total weekly cost	=	$22,260.80
Total annual cost	=	$1,157,562

5.1.2.1.1.5 Supervisors

In addition to the supervisor assigned to maintenance, Newport employs five other supervisors. Each works a 40-hour per week shift and are salaried employees. For estimating costs for supervisors, an hourly rate of $47.50 is used. Therefore, the total annual costs for supervisors is $494,000.

5.1.2.1.1.6 Summary

Scale operators	=	$ 351,424
Administration	=	468,705
Processing staff	=	4,087,356
Maintenance staff	=	1,157,562
Supervisors	=	494,000
		$6,559,047

5.1.2.1.2 Overhead Allowance

In 1998, an allowance was provided to cover such items as main office staff, health and safety, training, public relations, office equipment, and related expenses. This allowance was estimated to be $500,000.

It is believed actual overhead allowance is probably less than $500,000 annually. For the 2006 analysis, this allowance is reduced to $250,000 per year.

5.1.2.1.3 Site Maintenance

Site maintenance costs include repairs to pavement, access roads, and general landscape maintenance, which is minimal. The majority of the site maintenance would occur on access roads that take the bulk of the wear at the facility. In 1998, site maintenance was estimated at $120,000 per year.

For 2006, the 1998 estimate was adjusted for inflation to $152,000 per year.

5.1.2.1.4 Building/Equipment Maintenance

Building maintenance can be further divided into fixed equipment maintenance and mobile equipment maintenance. Fixed equipment maintenance would include parts, machinery, etc. for fuel processing equipment. This would include the conveyors, hammermills, magnetic separators, etc. that are typically stationary. Mobile equipment maintenance includes maintenance and replacement of loaders, yard tractors, trailers, grapples, and other equipment on site.

In 1998, fixed equipment maintenance was estimated to be $1,000,000 per year. This estimate was based on 10 percent of the installed capital cost for the equipment. This is likely a high estimate since the fixed equipment is not replaced every ten years or subject to cost for parts over ten years that would equal the replacement cost. For example, the microsilicia topping lasted 12 years before replacement. Additionally, the large equipment is likely to have a service life more closer to 20 years. Therefore, for 2006, fixed equipment and building maintenance is estimated at $1,000,000 per year.

Mobile equipment maintenance included loader operation and maintenance, loader replacement, yard tractor O&M, yard tractor replacement, and a 10 percent contingency. Newport currently has two Case 921 loaders that operate on average 18 hours per day Monday through Friday and 10 hours per day on Saturday and Sunday. Estimated cost for O&M is $20.00 per hour. Replacement of loaders occurs approximately every three years. Each loader is estimated to cost $325,000. O&M costs are estimated to be:

220 hours/week x $20.00/hour = $4,400/week x 52 weeks = $228,800/year

Each loader is replaced every three years; there are three loaders that each cost $325,000; and trade-in value is estimated to be $40,000 (Bill Burkett, St. Joseph's Equipment); therefore, each loader has an annual cost of $95,000 and replacement allocation is $285,000 per year.

The Newport Facility has three yard tractors that are replaced one every five years. Each yard tractor is estimated to cost $60,000, with an estimated salvage value of $10,000. Two of the three tractors operate 20 hours per day. The third tractor on average operates 10 hours per day. Therefore, O&M costs for the tractors, estimating $10 per hour for O&M, would be $3,500 per week, or $182,000 per year. Replacement is on a 15-year cycle so replacement allocation is $4,000 per year per tractor, or $12,000 annually.

5.1.2.1.5 Electricity

Electrical costs charged to the Project Board in 2005 were approximately $360,000. NRG has additional electrical costs that are not passed through, and based on discussion with NRG, the annual cost is estimated at $450,000.

5.1.2.1.6 Utilities

Utilities include natural gas, telephone, water, and sewer. In 1998, a natural gas estimate of $150,000 per year was used for heating and a $20,000 allowance for telephone, city water, and sewer. Newport continues to use similar amounts of these services. Adjusted for inflation, utilities are estimated to cost $215,000 per year.

5.1.2.1.7 Fire/Explosion Suppression

The 1998 analysis included $85,000 per year for the Fenwall system to limit damage from explosions in the hammermill area. In discussions with Gary White, the Fenwall system is no longer used at the Newport Facility.

5.1.2.1.8 Insurance

The 1998 allowance for insurance coverage was $200,000 per year. This estimate is believed to be appropriate. Adjusting for inflation would give a 2006 insurance estimate of $250,000 per year.

5.1.2.1.9 Contingency

Contingency is used to cover costs not otherwise accounted for in the previous sections. For this analysis, a 10 percent contingency is used.

5.1.2.1.10 RDF Haul and Residue Haul Costs

NRG indicated the average load weight for RDF hauled is approximately 18.5 tons, and the residue loads are somewhat lower. With these load weights, an industry estimate of $0.11 per ton-mile was used to calculate the anticipated haul costs to transport RDF to Red Wing and Wilmarth plants and residue and bulky waste sent to the Burnsville Sanitary Landfill.

Based on the data in Table 2-1 for this analysis, an average of 430,711 tons per year are accepted at Newport, with an average of 375,984 tons processed. This yields 54,727 of bulky waste residue. An average of 329,807 tons of RDF is produced plus an average of 3.4 percent of ferrous and non-ferrous metals are removed, yielding an average of 34,304 tons of process residue. RDF hauled to Red Wing averages 188,069 tons and to Wilmarth, 141,692 tons. The round-trip haul distance to Red Wing is 80 miles and the round-trip haul distance to Wilmarth is 200 miles; therefore, the RDF haul costs are:

188,069 tons x 80 miles x $0.11/ton-mile	=	$1,655,007
141,692 tons x 200 mils x $0.11/ton-mile	=	3,117,224
Total	=	$4,772,231

Residue disposal was assumed to be sent to the Burnsville Sanitary Landfill. There is a total average of 89,031 tons of bulky waste and process residue. With a round trip distance of 40 miles from Newport to the Burnsville Sanitary Landfill, this projects to an annual cost of $391,736.

5.1.2.1.11 Landfill Costs

Disposal costs are approximately $25 per ton for process residue and $42 per ton for bulky waste residue. Therefore, the annual process residue cost is 34,304 times $25, which equals $857,600. The bulky waste disposal cost is $42 times 54,727 tons, which equals $2,298,534. Total residue disposal costs are estimated at $3,156,134.

5.1.2.1.12 Hazardous Waste Handling

Hazardous waste is identified as loads are dumped on the tipping floor. Primarily, the hazardous wastes encountered are household hazardous waste (HHW) and batteries. These wastes are identified, segregated from the MSW and placed in the HHW building for processing, bulking, and preparation for shipping to a permanent disposal facility.

Costs for HHW handling and disposal includes rental on the HHW building and estimates on disposal costs for HHW. Actual HHW quantities are difficult to quantify due to the variability in HHW received and processed at the site. In 1998, HHW handling and disposal was estimated to be $5,000 per year. Adjusting the 1998 cost for inflation yields a 2006 estimate of $6,350.

5.1.2.1.13 NRG/NSP Contract

The NRG/NSP (Xcel) contract contains three key components—a "burn incentive," a fuel credit, and a penalty clause. Each of these components is discussed below.

- The burn incentive was developed to pay Xcel (formally NSP) additional money to burn RDF over the 168,480 tons per year minimum RDF amount. This incentive, currently estimated by NRG to be $20.00 per ton for every ton over the 168,480 minimum, is pro-rated monthly (14,040 tons per month) and paid to Xcel based on the tons burned at the Red Wing and Wilmarth plants. For Newport, the total RDF produced is 329,807 tons. Therefore, the burn incentive is paid on:

  329,807 tons − 168,480 tons = 161,327 tons.

  Total annual cost to Newport for the burn incentive is $3,226,540.

- The fuel credit is based on the heating value of the RDF up to 196,560 tons per year. The credit is adjusted based on several indices. The current credit is approximately $7 per ton of RDF up to 196,560 tons. Over the 196,500 tons, no fuel credit is available. Therefore, NRG receives a revenue or credit of $1,375,500 per year.

- The penalty clause is invoked if Newport does not deliver 340,000 tons per year of RDF. The penalty clause is set equal to the burn incentive ($20.00 per ton). Based on an average of 329,807 tons of RDF, there is an average shortage of 10,193 tons, which equals a penalty of $203,860 on average per year.

5.1.2.1.14 Summary

Table 5-1 provides a summary of the operations and maintenance costs were estimated for the Newport facility:

Table 5-1 Summary of Newport Facility O&M Costs

		Cost (2006$)
Labor		
Scale operators		$ 351,420
Administration		468,700
NRG processing staff		4,087,360
Maintenance staff		1,157,560
Overhead		250,000
Site maintenance		152,000
Building maintenance		
Fixed equipment & building		1,000,000
Mobile equipment		
Loader O&M		228,800
Loader replacement		285,000
Yard tractor O&M		182,000
Yard tractor replacement		12,000
Electricity		450,000
Utilities		215,000
Insurance		250,000
	Subtotal	$9,089,840
10% contingency		909,000
	Subtotal	$9,998,840
RDF Transport		4,772,230
Residue Transport		391,740
Landfill Costs		3,156,130
Haz Waste Handling		6,360
Xcel Burn Incentive		3,226,540
Fuel Credit		NA[1]
Penalty Payment		203,860
Property Taxes		335,000
	Total Cost	$22,090,700

[1]The fuel credit from Xcel is passed through to R/W Counties and therefore is not a credit to reduce NRG's costs.

5.1.3 Projected Revenues

The Service Agreement between R/W Counties and NRG will expire in July 2007. At that time, R/W Counties will have fully paid for the initial bonded cost of the Newport Facility as one of the line items of the Service Fee. After the Service Agreement expires in July 2007, the annual revenue to the NRG Newport Facility are currently expected to be based on a "Merchant Plant" approach wherein NRG would contract with private waste haulers for waste delivery. The reported tip fee price has been $55 to $60 per ton.

Table 5-2 provides the Projected Annual Newport Facility Revenues after the current contract with the Project Board expires.

Table 5-2 Projected Annual Newport Facility Revenues

Projected Revenue Item	Projected $
Tipping Fee Revenue[1]	23,650,000
Citizen Area Tip Fees	50,000[2]
Ferrous Recovery Revenues[3]	320,000
Aluminum Recovery Revenues[3]	600,000
Total Revenues	24,620,000

[1] Based on an average tip fee of $55 per ton times 430,000 tons per year.
[2] Estimate is based on historical fees.
[3] Based on ferrous recovery of 3.4 percent of the annual tonnage processed of 375,984 tons and 0.2 percent for aluminum recovery. Revenues per ton of $25 for ferrous and $800 for aluminum are included, net of transportation.

As shown in Table 5-2, the Projected Annual Revenues are approximately $24,620,000. There may also be revenues associated with the RDF fuel credit from Xcel. However, at this time, it is believed by Foth & Van Dyke that Xcel desires additional compensation from NRG to continue burning the RDF at their combustion facilities in Red Wing and Wilmarth. If so, that would raise NRG's operating costs which have not yet been adjusted in this report. Therefore, for preliminary planning purposes, with no Xcel related cost increase to use, no Xcel fuel credit revenues are included in these calculations as a means to offset the likely Xcel combustion cost increase. In addition, the tipping fee revenue in Table 5-2 was calculated using $55 per ton for the tipping fee (rather than a higher fee of $60 per ton). It is currently not clear what rate NRG will be able to contract for waste deliveries in the Merchant Plant approach. While the $60 per ton rate would show more revenue, it is possible the tipping fee may need to start lower than $55 per ton and may build over time.

With the estimated annual cost in Table 5-1 of $22,090,700 (2006$), there is a net income before debt service and taxes of approximately $2,530,000.

5.1.4 Projected Purchase Cost of the Newport Facility

The Project Board has an option to purchase the Newport Facility at the termination of the Service Agreement. As noted above, by July 2007, R/W Counties will have paid the full capital and financing costs of the Newport Facility as part of the Service Fee over the life of the 20 year Service Agreement. Even so, Article XI of the Service Agreement between the Project Board and NRG provides:

> *Upon expiration, the Counties shall have an option to purchase the Facility and Facility Site, including all machinery, equipment, supplies, and other materials necessary for the continued operation of the Facility as an RDF production and resource recovery plant.*

The Service Agreement further defines the notice, negotiation process, and potential for arbitration to reach an acceptable purchase price. The context of the basis for the purchase price focuses on the value as an ongoing RDF production and resource recovery plant. Therefore, the approach to estimating the purchase cost of the Newport Facility for the Counties is to approach it as an investor in an ongoing business based on its potential financial performance.

The approach employed to determine the purchase cost for the Newport Facility views that the value of the existing business lies with its ability to produce a positive cash flow. Industrial averages for the viable life expectancy of similar facilities lies between 20 and 25 years. An independent investor would expect a 30 percent return to enable servicing debt, taxes, and profit.

Based upon this pricing methodology, the purchase price would fall within the following range.

	Positive Cash Flow/Year		Cumulative Present Worth (End of Period)		Estimated Business Value
Low	$ 2,530,000	x	3.316 @ 20 years	=	$8,389,480
High	$ 2,530,000	x	3.329 @ 25 years	=	$8,422,370

The positive cash flow was developed from projected NRG revenues after the current R/W Project Board contract expires. The projected revenues as shown in Table 5-2 above, are based on a "Merchant Plant" approach assuming an average tipping fee of $55 per ton. The projected positive cash flow is based on the projected revenues minus NRG operating costs from Table 5-1.

The cumulative present worth factor is the sum of all calculations of the future value for the number of years being considered. If the Newport Facility is purchased, the price being paid is in today's dollars while the revenue being generated is annual over the next 20 to 25 years. By multiplying today's earning by the cumulative present worth factor, it is essentially providing the investment value required (approximately $8,400,000) at 30 percent interest to provide a $2,530,000 per year return each year over the next 20 years.

There are numerous variables that may enter into a final negotiated purchase price. This estimate provides an initial basis for negotiations and preliminary financial analysis.

5.1.5 Expansion Capital and Operating Cost

This section details the assumptions, costs, and conditions to increase processing capacity of the existing Newport Facility by 100 tons per hour (tph). The increase in processing capacity, double the current capacity, is designed to meet the Rock-Tenn fuel needs in conjunction with continuing to meet the Xcel needs. The following subsections discuss capital cost estimates and operating cost estimates for the expanded Newport Facility. Permitting associated with the expansion of the Newport Facility is discussed in Section 9.2.

5.1.5.1 Expansion Cost

The original design of the Newport Facility was to have three 50 tph processing lines even though only two lines were installed. The general Newport Facility layout is shown on Figure 5-1. The site currently includes two 50 tph RDF processing lines and a bulky waste residue loadout (or Trash Load Out [TLO]). The bulky waste residue line shown on Figure 5-1 is where a new third line would be installed.

Installation of a third processing line would require new equipment and reconfiguration of the bulky waste residue loadout. Relocation of bulky waste loadout facilities is estimated to cost $2,000,000. The bulky waste loadout would be moved north into the area between the service center and receiving building.

To estimate costs for the purchase and installation of a third process line located within the existing building, Wolf Material Handling Systems (Wolf) in Elk River, Minnesota, was consulted. Wolf was the original process equipment vendor for the Newport Facility. Wolf provided an estimate of $9.68 million for the equipment cost for the third line. This estimate assumes the existing ferrous enhancement/loadout, the aluminum enhancement/loadout, residue loadout, and RDF loadout in the existing plant would be used for the third line.

The estimate does not include installation, controls, permits, etc. For mechanical installation, an estimate of 40 percent of the equipment costs was used for a budget estimate. Additionally, another 60 percent of the equipment costs are added for civil improvements, including concrete footings, building modification and structural steel addition. Wolf indicated that for the third line, dust control systems would need to be enhanced. An estimate of an additional $1 million for upgrades to dust control was used.

For the third process line, the estimated costs would be:

Mechanical equipment	$ 9,680,000
Mechanical installation (40%)	3,872,000
Civil installation (60%)	5,808,000
Dust control equipment	1,000,000
	$20,360,000

Since the installation of the third line would likely be coupled with a fourth process line (so a total increase of 100 tph would be achieved) permitting costs were not included in the third line costs. Permitting costs are provided in the cost estimate for the fourth line. Estimated costs for adding the fourth process line at the Newport Facility follows.

The Newport Facility tipping floor has been expanded. This expansion included a wall knock-out on the south end of the tipping floor for a fourth processing line to be added. The knock-out is located approximately 17 feet north of the south wall of the tipping floor and the knockout is approximately 15 feet wide.

In discussions with Gary White, it is anticipated that conceptually, the fourth line would be located where the knock-out is in the tipping floor and extend east. The existing dust collection equipment, ferrous loadout, and aluminum loadout would remain where they are currently located. Thus, for purposes of this preliminary cost estimate, the fourth line would be in a separate building south of the process building.

This new building is estimated to be 50 feet wide by 340 feet long (17,000 square feet) to match the other building. There may be a concern with encroachment into the Mn/DOT right-of-way currently along the south property line. Further analysis would be required prior to building the fourth line. It is anticipated that any potential encroachment into the Mn/DOT right-of-way would be mitigated through design changes to the building/process. The fourth line addition may also limit traffic flow to the south of the building, limit access to the fuel station, require relocation of the fire hydrant, and require new trailer parking areas (anticipated to be relocated between the existing employee parking area and the electrical substation to the north). These requirements would be considered incidental to the fourth line construction. A concern was also raised regarding continuing to use and have access to the ferrous loadout, aluminum loadout, and dust collection facilities currently on the south side of the process building. Adding the fourth line where the knockout is, could pose access issues to the existing facilities. In discussions with Gary White, he believes these issues will be minimal and could be mitigated by using smaller vehicles to load out materials in this area.

The estimate to construct the building to house the fourth line was based on an industry average of $90 to $100 per square foot for industrial building space.. This cost estimate includes civil site work, building, erection and limited heating and ventilation systems. The estimate to construct the building would be $1.53 to $1.70 million.

The mechanical equipment for the fourth line would be similar to the third line except the need to add the RDF loadout, dust collection, ferrous separation, and aluminum separation. Wolf estimated an additional $2 million for process equipment for line four, above the cost provided for the line three. Therefore, the cost for line four, a 50 tph process line, at the Newport Facility would be:

Building and civil site work	$ 1,700,000
Mechanical equipment	9,680,000
Mechanical installation (40%)	3,872,000
Civil installation (60%)	5,808,000
Additional facilities	2,000,000
	$23,060,000

If the addition of the fourth line requires relocation of systems currently on the south side of the process building (dust control, ferrous loadout, aluminum loadout) add an additional $2 million to account for relocation of the systems.

Finally, an estimate is provided regarding permitting the expansion of the Newport Facility. It is anticipated a re-permitting for expansion of the facility would require an EAW (see Mn Rules 4410.4300, Subpart 17) and possibly an EIS. However, should the Newport Facility be expanded to service the Rock-Tenn Biomass/RDF Facility, the Rock-Tenn EIS would address the expansion of the Newport Facility. Thus, for permitting estimates only, the EAW and building permits are included. A permitting cost of $200,000 is estimated.

To summarize, the following costs are estimated to increase the Newport Facility by 100 tph.

Relocation of existing bulky waste loadout	$ 2,000,000
Third process line equipment and installation	20,360,000
Fourth line building, equipment, and installation	23,060,000
Permitting (other than EIS)	200,000
	$45,620,000

5.1.5.2 Expansion Operating Cost

The doubling of the throughput of the Newport Facility would not double the operating costs. In fact, significant economies of scale would be realized in the operating costs. This is achieved since the added capacity is primarily mechanical equipment that would require only minimal staff increases to operate the additional two process lines. The following details the anticipated additional operating costs should the Newport Facility be expanded to increase throughput from 100 tph to 200 tph.

The existing Newport Facility operating costs were provided in Section 5.1.2.2. These costs were summarized in Table 5-1. For ease of review, Table 5-3 is provided that shows the current O&M costs, expected increases, and total O&M cost with lines three and four added to the Newport Facility.

Table 5-3 Summary of Newport Facility O&M Costs with Lines 3 and 4 Added

	Cost (2006$)	Est. Increase (2006$)	Total Cost (2006$)
Labor			
Scale operators	$ 351,420	$ 0	$ 351,420
Administration	468,700	0	468,700
NRG processing staff	4,087,360	1,671,696	5,759,056
Maintenance staff	1,157,560	263,038	1,420,598
Overhead	250,000	0	250,000
Site maintenance	152,000	0	152,000
Building maintenance			
Fixed equipment & building	1,000,000	1,000,000	2,000,000
Mobile equipment			
Loader O&M	228,800	0	228,800
Loader replacement	285,000	0	285,000
Yard tractor O&M	182,000	90,000	272,000
Yard tractor	12,000	6,000	18,000
Electricity	450,000	450,000	900,000
Utilities	215,000	107,500	322,500
Insurance	250,000	50,000	300,000
Subtotal	$9,089,840	$3,638,234	$12,728,074
10% contingency	909,000	363,800	1,272,800
Subtotal	$9,998,840	$4,002,034	$14,000,874
RDF Transport	4,772,230	1,390,000	6,162,230
Residue Transport	391,740	240,000	631,740
Landfill Costs	3,156,130	2,508,400	5,664,530
Haz Waste Handling	6,360	6,360	12,720
Xcel Burn Incentive	3,226,540	0	3,226,540
Fuel Credit	NA[1]	0	0
Penalty Payment	203,860	0	203,860
Property Taxes	335,000	200,000	535,000
Total Cost	$22,090,700	$8,346,794	$30,437,494
Cost per ton MSW received	$51.37[2]		$34.10[3]

[1] The fuel credit from Xcel is passed through to R/W Counties and therefore is not a credit to reduce NRG's costs.
[2] Based on the Total Cost divided by an annual average of 430,000 tons.
[3] Based on the Total Cost divided by an annual average of 892,700 tons (see Table 2-3).

Based on discussions with Gary White, with the addition of two lines, it is anticipated NRG processing staff would increase by six processors and one mechanic. The other positions, electrician, helper, and contract laborer were not anticipated by Mr. White to require additional staffing to support two new process lines.

The total increase for the additional staff is estimated to be:

Processors (6 each at $4,560/week)	=	$27,360/week
	=	$1,422,720/year
Mechanic (1 each at $4,788/week)	=	$4,788/week
	=	$248,976/year
Total increase	=	$1,671,696/year

Maintenance staff is expected by Mr. White to increase by one mechanic and two laborers to account for increased maintenance on the two additional lines. Estimated cost for the additional maintenance staff is:

2 laborers at $2,943/week	=	$153,046
1 mechanic at $1,596/week	=	82,992
	=	$263,038

There will be more yard tractor activity to account for the additional material movement.

A 50 percent increase in utilities is anticipated due to the addition of two lines to the existing facility. This increase is estimated to be $107,500 per year.

A $50,000 increase for insurance was added to account for the increased processing capacity, building space, and staff. This is a 20 percent increase over the existing costs.

The Rock-Tenn related RDF Transport, Residue Transport, and Landfill costs are developed in other sections of this report. With the added RDF burned at Rock-Tenn, there are no additional NRG Burn Incentive costs. A property tax increase was pro-rated for the additional equipment and building but no added land.

5.2 C&D Waste Processing Facility

The purpose of a mixed construction and demolition waste (C&D waste) processing facility is to separate and market recyclable materials from incoming loads (i.e., divert the recyclable materials from the waste stream for reuse). A C&D waste processing facility can be a "stand alone" facility or it can be part of a "front-end separation" process at a waste-to-energy plant, resource recovery facility or C&D landfill. For the purpose of this analysis, the C&D waste facility will be designed to recover recyclable materials, process a portion to meet the specifications of the primary end use material (C&D biomass fuel), with a portion required to be landfilled.

Foth & Van Dyke is aware of several mixed C&D waste processing facilities operating throughout North America. Table 5-4 shows three somewhat similar facilities are located in San Francisco, California; New Bedford, Massachusetts; and Des Moines, Iowa. These facilities were designed to process mixed C&D waste into specific end-use products like, alternative daily landfill cover (ADC), biomass fuel, wood products (mulch, bedding, fiber) and other recyclable commodity types (metal, cardboard, aggregates) available in the local market area. Most mixed waste C&D processing operations built in recent years are facilities that are partially or totally enclosed. In some states, like Iowa, the receiving, storage and processing of mixed C&D waste has to occur within enclosed areas. Facilities in other parts of the country have enclosed all or parts of their operations for other reasons, which were to (1) create a good working environment for employees, (2) keep incoming materials dry and easy to handle; (3) maintain a clean and clear tip floor area for incoming material; and (4) reduce visibility and noise when operating in industrial areas.

Table 5-4 Mixed C&D Waste Processing Operations in the United States

Location	Operation	Facility Type	Design Capacity	Date Operational	Capital Cost
San Francisco, CA	Mixed C&D Processing	46,000 sq. ft. enclosed building	1,200 tons/day	2003	$14 Million
New Bedford, MA	Mixed C&D, MSW Transfer Station	47,000 sq. ft. enclosed building	1,500 tons/day	2002	$7.5 Million
Des Moines, IA	Mixed C&D Processing	45,000 sq. ft. enclosed building	500 tons/day	2004	$5.5 Million

5.2.1 Processing Technology

Technologies for processing mixed C&D waste can include many different types of mechanical processing and sorting system configurations. The processing design strategies utilized by the operations listed in Table 5-4 were determined by the composition of the incoming waste streams (i.e., mixed C&D waste and industrial waste), sorting equipment, and size reduction parameters for the C&D biomass fuel product.

For this analysis, Foth & Van Dyke assumed the types of C&D wastes and compositions are similar to the Des Moines area. In addition, the facility is assumed to be designed around the recovery of the recyclable, non-combustible fraction (i.e., metals, aggregate, and fines) for the available local end-use markets and the combustible fraction (i.e., wood, contaminated fiber, plastics, etc.) for use as a biomass fuel.

The C&D biomass fuel product will need to match up to the specifications of the existing RDF and for preliminary planning purposes may consist of a 2 to 4 inch minus size material with a minimum heating value between 6,200 and 6,400 Btu per pound.

In the mixed C&D waste processing industry, the facilities listed in Table 5-2, utilize systems and processes that are considered "High Technology" (High-Tech). These types of operations require more equipment than low-technology (i.e., salvaging or dump & pick) or intermediate-technology operations (accepts primarily one to two types of C&D material), but still incorporate some manual sorting labor. Automated sorting processes have not evolved to the point where a facility can be fully automated; therefore manual picking stations are still required when mixed C&D waste is recycled into marketable end-use commodities. High-Tech facilities are typically designed for operations with high throughput volumes (500 plus tons per day) of mixed C&D materials.

The advantages of High-Tech facilities may include higher recovery rates of recyclables, as well as higher throughputs of waste per worker, which reduces labor cost per ton.

The disadvantages of High-Tech facilities include the increased capital and maintenance costs for equipment and potential equipment related downtime. Contamination may still be a problem.

The High-Tech approach can be applied to more types of waste streams and process a larger daily volume. However, incoming material that is kept clean and dry will also result in higher recovery rates.

A High-Tech mixed C&D waste processing facility may include the following equipment and processing techniques:

- **Conveying Equipment** - Conveyors transfer materials from one location to another. The most common type of conveying equipment used to process C&D is a belt conveyor which consists of a strip of belting material that is looped around a shaft on each end.

- **Crushing/Reducing Equipment** - Size reduction is the unit operation in which waste materials are mechanically reduced in size. The objective is to obtain a product that is reasonably uniform and considerably reduced in size in comparison with its original form.

- **Screening/ Separating Equipment -** Screening is a unit operation used to separate mixtures of materials of different sizes into two or more size fractions by means of one or more screening surfaces.

- **Magnetic & Electric Field Separation -** Uses the electrical and magnetic properties of waste materials to separate them.

- **Manual Picking Station -** An elevated platform with a conveyor and a catwalk along both sides of the conveyor. Manual sorting is done by removing specified items from the conveyor and dumping them in the appropriate chute provided to be deposited in the bunker below.

A more detailed listing of equipment and processing techniques in mixed C&D waste recycling facilities can be found in Appendix A.

5.2.2 Description of Operation and Material Flow

As mentioned earlier, technologies for processing mixed C&D waste can include many different types of mechanical processing and sorting system configurations. Until a more thorough analysis is conducted on the incoming C&D waste stream and desired biomass fuel product, the following operation and material flow description is for developing preliminary equipment and operational cost estimates only.

The proposed mixed C&D waste processing operation will be a totally enclosed facility of approximately 75,000 square feet. The process employed will include both automation and manual labor, primarily in the picking station area.

All inbound debris will be directed to a dedicated tipping (receiving) area. A loader working the tipping area will push the dumped debris towards an excavator that continuously feeds the finger screen (may be preceded by a pre-shredder).

This screen will separate the debris into three product sizes: fines (less than 2 inch minus), middles (2 to 8 inches) and overs (greater than 8 inches). The fine material falls onto a conveyor and is made to bypass the system for stockpiling and marketing as ADC or some other alternative use material. The middles and overs each fall onto separate conveyors with a cross-belt magnet located over the middles line to remove ferrous material. The middles and overs may be combined prior to being conveyed into the raised "picking room" within the processing area. The picking room is a mostly enclosed, heated and cooled space containing laborers that stand next to the conveyors and pick out materials to be recycled.

Any material not sorted out in the picking room is conveyed into a hammer mill, which breaks the remaining debris into a 2 to 4 inch minus size (size to be coordinated with RDF processing). This material is then passed under a magnet to remove any stray metals, screened to remove small particles, and is then conveyed to an indoor stockpile adjacent to the processing area. The facility would load vehicles each day using a bucket loader and an indoor loading ramp or alternatively, the biomass fuel could be conveyed directly to transfer trailers.

The non-biomass materials pulled from the C&D debris (which include metals, aggregate, and residue bypass) would be stored and moved to market or landfill on a regular, constant basis. Metals would be pushed for intermediate storage prior to being loaded onto vendor trucks, aggregate would be loaded onto trucks and stored on-site prior to further processing by an outside contractor, and residue bypass (trash) would be loaded onto trucks and transported to the landfill. For purposes of this analysis, approximately 50 percent of the C&D is assumed to be recovered as biomass fuel, another 15 percent will be recovered as recyclables, and approximately 35 percent is assumed to be landfilled (either directly by-passed or as process residue). The primary by-passed loads would be heavy with drywall or shingles and the fines that are separated by the finger screen. It should be noted that the economics of this system could be improved by finding additional uses for portions of the assumed 35 percent that is not recovered.

5.2.3 Site Needs

A mixed C&D waste processing operation in the range of 1,000 to 1,500 tons per day would require approximately 10 to 15 acres for the entire facility. Although, some facilities like the New Bedford operation, was built on 5 acres of land in an industrial part of the city. Typical utility needs would include three-phase electrical service, natural gas, water, and sewer. As with all processing facilities, adequate truck access to major highways and zoning for heavy commercial or light industrial is advisable. For purposes of this analysis, the C&D processing facility is assumed to be located at an existing C&D waste facility such as a landfill.

5.2.4 Capital and Operational Costs

5.2.4.1 Capital Costs

Capital costs for mixed C&D waste processing facilities can vary widely depending on the site conditions, throughput, and degree of automation. Table 5-4 shows the capital costs for three fully enclosed mixed C&D waste processing facilities between 45,000 and 47,000 square feet (SF). Capital costs for these operations ranged between $5,500,000 and $14,000,000 dollars. Site conditions elevated the costs of San Francisco facility, which had to overcome severe slope issues. The 47,000 SF New Bedford facility was designed to handle C&D debris, residential and commercial waste, and industrial waste materials, which increased throughput tonnages and added additional equipment requirements. The Des Moines facility was similar in enclosed building area size, but the daily throughput tonnage and equipment requirements were less than the other two higher cost operations.

As a preliminary estimate for this analysis Foth & Van Dyke obtained preliminary estimates for systems from processing equipment vendors and developed a typical cost per square foot for building construction and site development. Equipment costs ranged up to $4.7 million. Building costs ranged from $80 to $90 per square foot (including some site development costs). With a 75,000 square foot building and an average $85 per square foot cost estimate, the building cost estimate is $6.4 million. The total capital costs assumed for this analysis is therefore $11.1 million, in 2006$, which will be used in the financial analysis.

5.2.4.2 Annual Costs

Annual costs will be dependent on several factors, with return on investment, labor, and residue disposal being the largest. To develop a cost estimate for this project, Foth & Van Dyke reviewed proposals for previous projects, obtained working estimates from current operating vendors handling similar facilities, and developed cost estimates based on general experience.

Table 5-5 provides a build-up of a projected annual cost estimate assuming the processing facility will be located at an existing C&D facility such that some costs (scale operation and administration) are included in the existing operation. There is one Operations Manager, Foreman, and Office position regardless of the number of operating shifts. The number of Equipment Operators and Sorters will vary seasonally depending of the quantity of material to be processed. For this analysis, the second shift is assumed to operate 50 percent of the year. There is an allowance for utilities, fuel, maintenance, and equipment replacement of 20 percent of the equipment cost. The Contingency and Overhead allowance is 20 percent. An annual allowance at 30 percent of the capital cost is provided for Return on Investment. This covers debt service, taxes, and the owner/operators profit. Residue disposal is included at $25 per ton and the fuel transfer to Rock-Tenn is included.

The cost per ton including operations and debt recovery is estimated in Table 5-5 to be $37.91 per ton.

Table 5-5 C&D Facility Annual Cost Estimate

Annual Base Rate	Labor	1 Shift	2 Shifts 50%
$60,000	Operations Manager	$60,000	$60,000
$50,000	Foreman/Head Mechanic	$50,000	$50,000
$35,000	Office/Clerk	$35,000	$35,000
	Equipment Operators		
$45,000	Tip Floor Loader	$45,000	$67,500
$45,000	Excavator	$45,000	$67,500
$45,000	Op. Line Loader	$45,000	$67,500
$45,000	Floater	$45,000	$67,500
$45,000	Mechanic	$45,000	$67,500
	Subtotal Permanent Labor	$370,000	$482,500
	Fringes @ 30%	$111,000	$144,750
	Sorters (8 ea.)		
$25,000	Residue	$200,000	$300,000
$25,000	Metals	$200,000	$300,000
$25,000	Aggregate	$200,000	$300,000
$25,000	Floater 4 ea.	$100,000	$150,000
	Subtotal Sorters	$700,000	$1,050,000
	Fringes @ 15%	$105,000	$157,500
	Subtotal Labor	$1,286,000	$1,834,750
	Util./Ins./Fuel/Main./Replace @ 20% Equip. Cost		$940,000
	Subtotal		$2,774,750
	Contingency and overhead (@ 20%)		$554,950
	Return on investment (30% NIBDT)		$3,330,000
	Subtotal		$6,659,700
	Residue disposal @ $25 per ton		$2,187,500
	Fuel transfer to Rock-Tenn		$630,000
	TOTAL		$9,477,200
	Cost per ton		$37.91

5.2.5 Implementation Needs/Timelines

Permitting and construction of a mixed C&D waste processing facility could be completed in approximately one to two years. Permitting is not anticipated to be as difficult as other technologies. Depending on the procurement approach and financing method, a mixed C&D

waste processing facility could be operational within two years of a decision to utilize the technology.