

BROWN, VENCE & ASSOCIATES

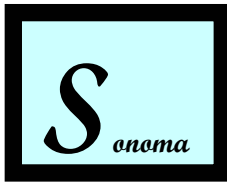


Assessment of Long-Term Solid Waste Management Alternatives

Sonoma County

Final Report | January 2006





Assessment of Long-Term Solid Waste Management Alternatives

Sonoma County

Presented to | Susan Klassen, Deputy Director
Transportation/Operations
Sonoma County Dept. of Transportation and Public Works
2300 County Center Drive, Suite B-100
Santa Rosa, CA 95403

Presented by | Brown, Vence & Associates
115 Sansome St., Suite 800
San Francisco, CA 94104

Table of Contents

Executive Summary

Section 1 Introduction	1-1
Section 2 Background Information and Assumptions	2-1
Section 3 Waste Stream Projections.....	3-1
Section 4 Screening Methodology and Evaluation Criteria	4-1
Section 5 Alternatives Analysis	5-1
Section 6 Integrated System Scenarios	6-1
Section 7 Economic Analysis	7-1
Section 8 Results and Recommended Action Plan	8-1

Appendices

Appendix A – System History

Appendix B – Survey of Counties and Landfills

Appendix C – Zero Waste Project and Program Ideas Sonoma County Local
Task Force – Solid Waste, Zero Waste Sub Committee – January 2005

Appendix D – Mandatory Collection

Appendix E – Waste by Rail Haul Letter Report – September 2005

Appendix F - Economic Pro Formas

Executive Summary

Introduction

Brown, Vence and Associates, Inc. (BVA) was retained by the Sonoma County Department of Transportation and Public Works (County) to assess an array of short- and long-term alternatives for management of Sonoma County's waste. Sonoma County's waste is currently managed through the Countywide Solid Waste Management System (System) consisting of solid waste facilities and programs throughout Sonoma County for the cities as well as unincorporated county residents and businesses. The goal of this Study was to develop, analyze, and evaluate these alternatives to support the County and the System in meeting its objective of providing Sonoma County residents and businesses with environmentally sensitive and cost-effective disposal and diversion options. The key steps of the Study included:

- Reviewing background information and waste stream data to develop certain assumptions and establish a basis for assessment;
- Development of twelve distinct screening and evaluation criteria using those criteria identified and approved as part of the Solid Waste Management Alternatives Analysis Project in December 2000 as a basis; these criteria were reviewed and accepted by the AB 939 Local Task Force (LTF);
- Assignment of weights for the criteria and defining scoring protocols for scoring the alternatives by each criteria; these were reviewed and decided upon by the LTF;
- Development, analysis, and evaluation of eleven short- and long-term alternatives including review and acceptance by the LTF;
- Scoring each of the eleven alternatives with respect to each of the twelve weighted criteria;
- Calculating and ranking the overall weighted scores of each alternative;
- Using the alternatives as "building blocks" to develop thirteen integrated system scenarios based on feasible combinations of the ranked alternatives;
- Ranking of the thirteen integrated system scenarios by the LTF;
- Utilizing the rankings to narrow the scenarios for economic analysis to four final integrated system scenarios; two scenarios including in-County disposal and two scenarios including out-of-County haul and disposal;
- Conducting a 20-year economic pro forma analysis on each of the four final scenarios, and ;
- Performing sensitivity analyses assuming 20% and 50% reductions in Sonoma County tonnages on the final four scenarios.



Executive Summary

The results of this Study yielded a recommended action plan detailing the key steps the County should implement to meet objectives over both the short- and long-term planning horizon.

The recommendations and action plan include:

- Determining to what extent the cities in Sonoma County may participate in the disposal portion of System;
- Understanding that the County can't expect commitments from the cities without providing for their input to the management of the disposal System, a mechanism needs to be established that commits the participants to utilize the disposal portion of the System through joint participation in decision making;
- Assessing the participation level to understand if disposal System infrastructure reformation is required (if the participation level drops to approximately 50%, a detailed evaluation of the necessity, benefit, and cost of each service currently offered along with a prioritization of service cuts and cost-reduction activities to bring County costs in line with available financial resources will need to be developed);
- For those cities that choose not to participate, recover unfunded liabilities for closure and post-closure activities at the Central Disposal Site (CDS) through negotiated cost-recovery mechanisms;
- Continue working with the North Coast Regional Water Quality Control Board (RWQCB) to obtain regulatory approval for maintaining an in-County landfill (maintaining an in-County landfill appears to be the AB 939 Local Task Force (LTF) and public's preferred option, however, this is not the most economically favorable option because at least 80% disposal System participation is needed to cover the high level of fixed costs and capital expenditures required. Even if 80% participation is achieved, regulatory acceptance on a long-term basis will continue to be a major risk of in-County disposal);
- If approximately 80% disposal System participation is not achieved and/or regulatory approval from the RWQCB is not obtained, the County will need to continue out-of-County haul and disposal over the longer term planning horizon (5 years or more into the future); the County could continue trucking waste to Bay Area regional landfills as it is the most reliable and economical option to implement; the risks include potential host fees, increased fuel prices, and future shortages of regional landfill capacity; participant commitments are still necessary to achieve the best long-term pricing;
- Out-of-County haul and disposal by rail needs further review and consideration as it offers potentially long-term stable pricing as well as long-term available capacity; the local rail proponents need to provide the County with evidence of its long-term economic viability;

- If approximately 80% disposal System participation is not achieved and/or regulatory approval from the RWQCB is not obtained, the County may want to investigate the potential for sale of the CDS to a private company; this should include an independent valuation of the CDS from the perspective of a private owner/operator to allow the County to better understand the assets and liabilities of the CDS;
- Regardless of the disposal option selected, the County needs to fully implement reduce, reuse, and recycling programs and plans to divert waste from landfill. The County may want to adopt Zero Waste goals and policies for long-term high-level diversion success; as there are fewer tons available through greater and greater diversion efforts to cover fixed disposal System expenses, the cost per ton increases may be difficult to support on a disposal tipping fee basis. Other support fee structures need to be implemented such as user fees, general taxes, special taxes and property assessments; we understand that a sub-committee of the Sonoma County Waste Management Agency (SCWMA) is currently investigating this issue;
- The County should continue to monitor the potential future viability of a regional materials recovery facility and conversion technologies.

The key steps of the Study are presented in additional detail below. The background information and assumptions and waste stream projections are discussed initially to establish a basis for assessment. The assessment process is described through discussion of the: 1) screening and evaluation criteria, 2) alternatives analysis, 3) integrated system scenarios, and 4) economic analysis. The results and recommended action plan for the Study are presented at the conclusion of the assessment process.

Background Information and Assumptions

In 2003 the County Integrated Waste Management Plan (ColWMP) was adopted. The ColWMP described two main waste management objectives: 1) meet 50 percent diversion of solid waste disposal in 2003 and 70 percent diversion in 2015 based on 1990 disposal rates and 2) be able to provide the needed disposal capacity to accommodate population growth through 2018.

Since the ColWMP was issued and approved in 2003, several developments have occurred within the System that directly effect decisions regarding Sonoma County's short- and long-term solid waste management objectives. These include:

- The loss of Petaluma's waste stream and associated disposal System revenues; other jurisdictions have indicated that they are looking at their disposal options which may or may not include use of the disposal System.
- In response to contamination under a portion of the lined landfill at the Central Disposal Site (CDS) and potential groundwater issues, the integrity of the liner system came into question. As a result, the current RWQCB permit was revised to prohibit any new landfill expansion at the CDS until control and reduction of leachate



Executive Summary

and landfill gas is demonstrated, and a new liner system is approved. The County aggressively completed liner repairs and modifications and implemented additional monitoring and control measures and levels of contamination are now reduced to extremely low levels. We understand that no contamination is migrating off of the landfill site. However, the County has temporarily stopped accepting waste at the CDS for landfill disposal effective September 2005 as a result of the RWQCB permit revisions.

These developments have caused:

- Loss of revenues to pay for System costs
- Increase in landfill tipping fees
- Direct export of waste out-of-County, and
- Cities exploring other alternatives for solid waste management.

Although these new developments and constraints may cause concerns for the County, they also provide an opportunity to re-assess Sonoma County's short- and long-term solid waste management plans. These plans must now consider these new issues and must include providing long-term cost effective diversion and disposal options, as indicated in the CoIWMP.

Existing System Infrastructure

Solid Waste Collection, Recycling, Transfer & Disposal

Solid waste generated in Sonoma County is handled by eleven licensed or franchise hauling companies. Each of these franchised and licensed companies has specified operational territories within Sonoma County. The haulers collect solid waste, wood & yard waste, and recyclables from the curbside and deliver them to an appropriate County directed facility. Existing solid waste facilities in Sonoma County include the Central Disposal Site (landfill portion recently closed in September 2005), which incorporates a Tipping Facility for transfer and other capabilities, and four operating transfer stations located throughout Sonoma County. In addition, there are seven closed landfill sites throughout Sonoma County.

Curbside recyclables and wood & yard waste are collected by the haulers and delivered to one of the County's disposal facilities or one of the two privately operated materials recovery facilities (MRFs) in Santa Rosa. Recyclables are processed at the MRFs, consolidated, and sold to markets. The Central Disposal Site (CDS) contains a composting facility that accepts the wood & yard waste materials delivered directly to it and from the transfer stations producing a compost product available to markets. In addition, Recycling-Reuse Centers are located at the Healdsburg and Sonoma Transfer Stations and the CDS. The Central Disposal Site Tipping Facility conducts floor sort activities recovering scrap metal, old corrugated cardboard (OCC), and other recyclable materials.

Solid Waste System Costs

Tipping fees at the Central Disposal Site for solid waste disposal were \$70 per ton in FY 2004/05. Operational costs for the CDS landfill were estimated to be approximately \$41 per ton of that amount. The remaining costs include:

- Handling of household hazardous waste
- Education and diversion planning
- County diversion costs
- Operations and environmental compliance for the transfer stations
- Out of Sonoma County transport and disposal
- Capital improvements at the transfer stations
- Capital improvements at the disposal sites (including closed sites)
- Engineering for other capital projects
- System administration
- Littler control
- Central closure
- Central post-closure
- Other landfills post-closure maintenance and monitoring, and
- Operating reserves.

Solid Waste System Agencies and Responsibilities

The Sonoma County Waste Management Agency (SCWMA) is the regional agency for the cities and unincorporated areas of Sonoma County. The SCWMA's purpose is to implement, monitor, and report programs to meet and maintain the waste diversion goals established by AB 939. AB 939 dictated that every city and county must meet 50 percent diversion. The County has recently completed a new base year study for 2003, which the California Integrated Waste Management Board (CIWMB) approved. The new base year study determined that the achieved diversion rate is 56%. The delegation of responsibility within the System is as follows:

- SCWMA is responsible for public educational materials and information, regional wood waste processing and yard debris composting, beverage container recycling for local public access, funding for diversion programs, and hazardous waste programs. These responsibilities are in addition to maintaining AB 939 planning documents and the CoIWMP.
- Cities are responsible for collection and all jurisdiction specific programs whereas the County is responsible for collection in unincorporated areas.



Executive Summary

- Sonoma County AB 939 Local Task Force (LTF) is the advisory committee to the SCWMA and Sonoma County Board of Supervisors. The LTF provides advice and assistance in preparation and ongoing development of solid waste management programs in Sonoma County.
- Sonoma County Health Services Department, Environmental Health Division is the designated Local Enforcement Agency (LEA).
- The County of Sonoma is the owner of all the solid waste disposal and transfer facilities in Sonoma County and is responsible for all facility related activities.

Waste Stream Projections

For purposes of this Study, updated waste disposal figures were projected using recent data from the 2003 Sonoma County Waste Management Agency (SCWMA) funding allocation worksheet as well as actual in-County disposal data for 2005. Tonnage disposed at the CDS amounted to 483,344 tons in 2003, as reported in the SCWMA figures. Actual disposal data from 2005 predicts that approximately 372,200 tons could be disposed at the CDS or other County designated sites in 2005. These figures are much lower than those predicted using the ColWMP based projections. The projected decrease in tonnage landfilled at the CDS or other County designated disposal sites for 2005 is due to the loss of the majority of the City of Petaluma's tonnage as well as an increase in recycling and reuse programs and additional diversion from the community. Figures adjusted for projected 2005 disposal show that approximately 63% of the waste is anticipated to be delivered by franchise haulers, while approximately 37% is anticipated to be delivered by self-haulers. Projections for waste disposal beyond 2005 were based on estimated population growth, off-set by future anticipated diversion including planned Zero Waste Programs. For the analysis an increase in disposal of 0.95% per year, as shown in the ColWMP, was assumed for 2006 through 2025. The results of this analysis predict that approximately 449,679 tons of waste (not including Petaluma's) will require disposal by 2025.

Screening Methodology and Evaluation Criteria

In order to assist Sonoma County in solving its short- and long-term solid waste management objectives, BVA developed a strategy to screen and evaluate a list of alternatives. The initial step in this process was to develop and define criteria to evaluate alternative waste management scenarios. After discussion with County staff, it was determined to utilize those criteria identified and approved as part of the Solid Waste Management Alternatives Analysis Project in December 2000 as a starting point for criteria development. These initial draft criteria were presented at a public meeting of the AB939 Local Task Force (LTF) on October 14, 2004. Each criterion was discussed and some were modified by agreement from members of the LTF during the meeting. At the same meeting, the LTF discussed the weight for each criterion and agreed on and adopted the weights used in this analysis.

Scoring and Weighting

In the next phase of the Study each of the alternatives was analyzed in detail and evaluated according to the twelve criteria. Each alternative received a score from 1 to 5 for each criterion, depending on consistency with the goals and objectives of the finalized criteria, updated from the 2000 Solid Waste Management Alternatives Analysis. The scores were assigned as follows:

Score of 5 – Exceeds Criteria's Objectives

Score of 4 – Partially Exceeds Criteria's Objectives

Score of 3 – Meets Criteria's Objectives

Score of 2 – Meets Some Criteria's Objectives

Score of 1 – Does Not Meet Criteria's Objectives

As discussed above, the weights adopted by the LTF for each criterion were then multiplied by the scores received from each criterion and summed by alternative (i.e. there were twelve weighted and scored criteria summed for each alternative).

Alternatives Analysis

BVA in cooperation with County staff identified eleven potential alternatives for handling Sonoma County's solid waste stream. These alternatives were divided into those that could be considered short-term (three to five years) or long-term (five or more years into the future). It should be noted that these alternatives are not in any priority order or mutually exclusive, and were used in combination as overall integrated system scenarios to address potential solutions to Sonoma County's waste handling issues later in the Study. The alternatives include:

Short-Term Alternatives

- Alternative 1 – Exporting of Solid Waste Outside of Sonoma County
- Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste
- Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse and Recycling
- Alternative 4 – Expansion of Central Disposal Site
- Alternative 5 – Subregional Waste System

Long-Term Alternatives

- Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul



Executive Summary

- Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs
- Alternative 6 – Development of West Expansion Area
- Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County
- Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste
- Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Handle Source Separated and Non-Source Separated Recyclables
- Alternative 10 – Development of an Organics Processing Facility
- Alternative 11 – Privatization of All or Part of the Solid Waste System

With the exception of Alternatives 2, 5, 8, and 11, all of these alternatives listed above were analyzed in the 2000 Alternatives Analysis Project, which supported the 2003 ColWMP.

Each alternative was analyzed and evaluated using the identified and approved criteria. Draft alternatives and their definitions were presented at the public LTF meeting on October 14, 2004. LTF members reviewed the alternatives and provided comments, which were incorporated, as appropriate, into the alternatives analyzed as part of this Study. At the LTF meeting on December 9, 2004 results of the analysis, including the scoring and ranking of alternatives, were presented to the LTF for review and comment. Also on December 9, 2004, the alternatives and analysis were presented during a separate general public meeting. Comments and questions were incorporated into the final alternatives analyzed in this Study. We included the complete analysis and evaluation of each alternative in Section 5 of this report. Results of the Alternative Analysis scoring are shown in Table ES-1.

Integrated System Scenarios

The analyzed, scored, and ranked alternatives previously discussed were considered to be the “building blocks” of potential integrated system scenarios. With assistance from County staff, thirteen Integrated System Scenarios (A through M) were developed as shown in Table ES-2. The thirteen scenarios, including the development analysis, were presented to the LTF for discussion and comment at the December 9, 2004 meeting. The integrated system scenarios were also presented to the general public at a meeting later that day. In addition, each member of the LTF ranked the thirteen scenarios as part of the process of narrowing the field of options for economic analysis. The top ranked scenarios included:

- Integrated System Scenario D - waste is exported out-of-County for the short-term, the JPA assumes greater responsibility, diversion is maximized through zero waste policies and Central is expanded for long-term disposal;

Table ES-1 | Alternative Scoring

Alternative	Score
Short-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County	312
Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste	341
Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse & Recycling	355
Alternative 4 – Expansion of the Central Disposal Site	259
Alternative 5 – Subregional Waste System	232
Long-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul	262
Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs	378
Alternative 6 – Development of West Expansion Area	271
Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County	203
Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste	333
Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Divert Non-Source Separated Recyclables from the Refuse Stream (this alternative does not include development of a source-separated recyclables MRF as these are already operated by private industry)	278
Alternative 10 – Development of an Organics Processing Facility	248
Alternative 11 – Privatization of All or Part of the Solid Waste System	276

- Integrated System Scenario I - identical to Scenario D, except that a subregional waste system is assumed due to a downsizing of the disposal System to include only the unincorporated County and a couple of jurisdictions (approximately 50% of the existing disposal System); and
- Integrated System Scenario B - identical to Scenario D, except that after initial expansion of Central, the waste is hauled out-of-County for the long-term (this scenario was not given further consideration in the economic analysis as County staff believes that alternating between in-County and out-of-County disposal strategies would not be cost effective).



Executive Summary

Table ES-2 | Integrated Scenario Summary

Scenario	Institutional/Structural Issues	Short-Term Disposal	Facilities	Long-Term Disposal
A	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Export out-of-County with consideration of waste-by-rail for transport
B	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Expand Central and then export out-of-County
C	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Develop West Area at CDS and then export out-of-County
D	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Expand Central & Develop West Area at CDS and then export out-of-County
E	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	Develop MRF	Export out-of-County
F	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Export out-of-County
G	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Expand Central and then export out-of-County
H	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Develop West Area at CDS and then export out-of-County
I	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Expand Central & Develop West Area at CDS and then export out-of-County
J	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	Develop MRF	Export out-of-County
K	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop multi-county regional system	Export out-of-County	None	Export out-of-County
L	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop multi-county regional system	Export out-of-county	None	Expand Central & Develop West Area at CDS and then export out-of-county
M	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; privatize solid waste system	Export out-of-county	None	Private landfill

The ranking of these integrated system scenarios and details of the process were further discussed at the LTF meeting on January 13, 2005. Additional comments were provided for incorporation into the text and economics of the alternatives and scenarios. The revised alternatives, scenarios, and certain zero waste program economics were presented again to the LTF on March 10, 2005 for their review and approval. These top ranked integrated system scenarios were considered in developing the final options for economic analysis.

Economic Analysis

Using the LTF rankings, the thirteen integrated system scenarios were combined and narrowed down to four, which were considered the most feasible scenarios for analysis to determine the potential cost impacts over a 20 year planning horizon for Sonoma County. The four economic scenarios are described below.

Economic Scenario 1 – Out-haul for Five Years then Re-open Central with Industry Standard Containment System. Economic Scenario 1 represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. The waste will be transported and disposed through three separate contracts with Empire Waste Management (EWM), Keller Canyon Landfill Company (KCLC) and West Sonoma County Disposal Service (WSCD). During these five years, the County would work with the North Coast Regional Water Quality Control Board (RWQCB) to permit the Central Disposal Site for expansion of Phases III, IV, and V of the East Canyon, Phases I, II, and III of the Rock Extraction Area (REA) and the North Area Expansion. Development of these phases would create disposal capacity for an additional 14 years after out-haul to Year 19 or FY 2023-24. In this scenario, we are assuming working with the RWQCB will yield no extraordinary requirements for the containment systems. During this 14 year disposal period at Central, the County will also be working with the RWQCB to permit the West Expansion Site. Development of this site would include preparing an Environmental Impact Report (EIR), purchasing a small portion of the land that the County does not currently own, rock extraction activities and royalties, and construction of the site including impact mitigations, and the moving of the scale facilities. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Economic Scenario 2 – Out-haul for Five Years then Re-open Central with a Robust Containment System. Economic Scenario 2 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in Scenario 1, the waste will be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Again, during these five years, the County would work with the RWQCB to permit the expansion of the Central Disposal Site as discussed above to create disposal capacity for an additional 14 years after out-haul to Year 19 or FY 2023-24. The difference in Economic Scenario 2 is that after working with the RWQCB, robust containment systems would be needed at an additional cost per acre. Again, during this 14 year disposal period at Central, the County will also be



Executive Summary

working with the RWQCB to permit the West Expansion Site. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Economic Scenario 3 – Close Central Disposal Site and Out-Haul by Highway Transfer Vehicle. Economic Scenario 3 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in Economic Scenario 1, the waste will be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Although the Central Landfill is assumed closed for this Scenario, it still makes sense for the County to work with the RWQCB during the initial five year period to permit the expansion of the Central Disposal Site to allow flexibility in its future decisions. This scenario assumes that either the County is unsuccessful permitting the Central Disposal Site and/or unsuccessful in receiving commitments from other jurisdictions to garner flow control or a policy decision has been made not to re-open the CDS. The County's main option would be for long-term out-of-County haul and disposal. This economic scenario assumes that the out-haul portion of the operations would be by highway transfer vehicle. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Economic Scenario 4 – Close Central Disposal Site and Out-Haul by Rail. Economic Scenario 4 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in all the other scenarios, the waste will be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Although the Central Landfill is assumed closed for this Economic Scenario, it still makes sense for the County to work with the RWQCB during the initial five year period to permit the expansion of the Central Disposal Site to allow flexibility in its future decisions. As in Scenario 3, this scenario assumes that either the County is unsuccessful in permitting the Central Disposal Site and/or unsuccessful in receiving commitments from other jurisdictions to garner flow control or a policy decision has been made not to re-open the CDS. The County's main option would be for long-term out-of-County haul and disposal. This scenario assumes that the out-haul portion of the operations would be by rail. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Analysis Results

The results of the economic analysis are shown below in Table ES-3. Detailed pro formas for each of the four scenarios are included in Appendix C. The results are shown in a comparative format by Net Present Value (NPV) of the scenario's expenses and by the required tipping fee in dollar's per ton. The NPV analysis shows that the least cost option at approximately \$471.7 million over the 20 year analysis period, is Scenario 3 – Close Central Disposal Site and Out-Haul by Highway Transfer Vehicle. The next best option at

Executive Summary

approximately \$484.7 million over the 20 year analysis period is Scenario 4 – Close Central Landfill and Out-haul by Rail. Scenario 1 – Out-haul for Five Years then Re-open Central with a Normal Containment System was the next best option with an NPV of approximately \$518.1 million over the 20 year analysis period. The least favorable option was Scenario 2; Out-haul for Five Years then Re-open Central with a Robust Containment System. The NPV for Scenario 2 was approximately \$537.2 million over the 20 year analysis period. In analyzing the cost per ton, all scenarios were fairly close in cost over the first 5 years of the analysis. After the first 5 year analysis period, Scenario 2 was about \$5 to \$6 per ton more expensive each year than Scenario 1, due to the more costly containment system assumed in the Scenario 2 analysis. After the first 5 year analysis period, Scenario 4 was about \$3 to \$4 per ton more expensive each year than Scenario 3, due to a slightly higher estimated rail haul component assumed in the Scenario 4 analysis. As with the NPV analysis, the cost per ton analysis resulted in Scenarios 3 and 4, out-of-County haul and disposal being less costly than the development of Scenarios 1 and 2, representing in-County disposal. The cost differential between the two disposal options varies widely throughout the years of analysis. The differential is shown to be a low as \$4 per ton (between Scenario 1 and 4 in year 7) or as high as \$30 per ton (between Scenario 2 and Scenario 3 in year 20).

It should be noted that both potential “host fees” and fuel costs could affect the balance of the economic analysis. “Host fees” from communities that host the disposal site could be as high as \$12 to \$13 per ton. This level of “host fee” applied to future out-of-County disposal costs could make in-County disposal options more favorable. Assuming current transfer haul distances, fuel costs make-up only a minor portion of the overall out-of-County tip fee. Changes in fuel costs should not impact the balance of the overall economic analysis outcome.

Table ES-3 | Comparative Analysis of Economic Results

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)											
		1	2	3	4	5	6	7	8	9	10	15	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$518.1	\$ 70	\$ 86	\$ 90	\$ 94	\$ 98	\$109	\$100	\$103	\$106	\$109	\$121	\$148
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$537.2	\$ 70	\$ 86	\$ 90	\$ 94	\$ 98	\$115	\$106	\$109	\$112	\$114	\$127	\$153
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$471.7	\$ 70	\$ 86	\$ 90	\$ 91	\$ 95	\$ 94	\$ 93	\$ 95	\$ 98	\$100	\$109	\$123
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$484.7	\$ 70	\$ 86	\$ 90	\$ 91	\$ 95	\$ 98	\$ 97	\$ 99	\$101	\$104	\$113	\$128



Sensitivity Analyses

Two sensitivity analyses were developed to ascertain the effect on the overall economics assuming System tonnage loss. The first sensitivity assumed 80% of the current waste stream in FY 2005-06 or about 297,760 tons delivered to the disposal System. This represents a potential loss of a couple of additional cities to the disposal System. The second sensitivity assumed 50% of the current waste stream in FY 2005-06 or about 186,100 tons being delivered to the disposal System. This sensitivity represents a County only disposal System that assumes all unincorporated county waste as well as most of the County self-haul waste. Since the County's waste management budget is based largely on fixed costs, the cost per ton increases in both these sensitivities. This occurs as the County's annual costs do not decrease enough to offset the reduction in tonnage. Certain assumptions were made to both of these analyses to somewhat reduce the costs of operations due to the handling of less tons. Many of the costs were reduced to about 90% of their value for the 80% waste sensitivity; for the 50% waste sensitivity, many of the costs were reduced to about 75% of their value. This was due to the fact that handling fewer tons will result in less expense to the County. These expenses, however, could not be reduced on a "one-to-one" proportion, due to the fixed component of costs. In addition, for the 50% case, closure of the Guerneville Transfer Station was assumed as an example of a service reduction. The analysis assumes fixed costs associated with closure and post-closure are fully paid for by only the participating cities (i.e., 50% or 80% depending on the sensitivity analysis). These projected costs can be reduced through having the non-participating cities pay for their fair share portion of these closure and post-closure costs as discussed in the Recommendations Section of this Study. The result of each sensitivity case is shown below in Tables ES-4 and ES-5.

Analysis of the 80% tonnage scenarios show that although all costs per ton are increased, the difference in cost may not be significant enough to rule out consideration of re-opening the Central Landfill (Scenarios 1 and 2), especially if the jurisdictions involved are committed to in-County disposal. At the 50% tonnage level, we believe the costs are too high to consider in-County disposal through the scenarios representing re-opening of the Central Landfill (Scenarios 1 and 2). If the County does not receive disposal System support and the tonnage levels fall to the 50% level, out-haul appears to be the only reasonable disposal alternative.

Results and Recommended Action Plan

In-County Disposal

A strong preference for developing and maintaining in-County landfill capacity at the CDS was observed through meetings and discussions with the LTF and the public. The CoIWMP supports this preference. During the short-term period of 2003-2008, the CoIWMP calls for

Table ES-4 | Comparative Analysis of Economic Results at 80% Tonnage Levels

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)											
		1	2	3	4	5	6	7	8	9	10	15	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$453.1	\$ 75	\$ 92	\$ 96	\$ 99	\$103	\$110	\$113	\$119	\$122	\$137	\$134	\$157
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$469.1	\$ 75	\$ 92	\$ 96	\$ 99	\$103	\$117	\$120	\$125	\$128	\$143	\$140	\$162
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$406.4	\$ 75	\$ 92	\$ 96	\$ 98	\$102	\$102	\$101	\$103	\$106	\$108	\$117	\$133
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$416.8	\$ 75	\$ 92	\$ 96	\$ 98	\$102	\$106	\$104	\$107	\$109	\$112	\$121	\$137

Table ES-5 | Comparative Analysis of Economic Results at 50% Tonnage Levels

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)											
		1	2	3	4	5	6	7	8	9	10	15	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$367.2	\$ 87	\$110	\$116	\$119	\$125	\$145	\$150	\$154	\$158	\$163	\$181	\$217
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$379.3	\$ 87	\$110	\$116	\$119	\$125	\$153	\$157	\$161	\$166	\$170	\$188	\$224
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$308.5	\$ 87	\$110	\$116	\$118	\$123	\$127	\$124	\$127	\$130	\$133	\$142	\$162
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$315.0	\$ 87	\$110	\$116	\$118	\$123	\$131	\$127	\$130	\$133	\$136	\$146	\$167

development of siting criteria for a new landfill. The CoIWMP contemplates 50 years of disposal capacity. For the period 2009-2018, the CoIWMP calls for the siting process to continue with information being fully disclosed to the public, including procedures for selection or elimination of potential sites. In addition, maintaining in-County permitted landfill capacity at the County controlled CDS negates the risk of losing future capacity in the



Executive Summary

out-of-County disposal scenarios. Although the County has been working continuously with the RWQCB to gain approval for developing capacity at the CDS, it is still uncertain whether a permit for expansion of the CDS will be approved. In fact, as described throughout this Study, the existing regulatory prohibition on expansion of the landfill has forced the County to begin to out-hauling most of its waste as of September 1, 2005.

There is also risk to the County from a financial standpoint. The economic analysis determined that re-opening the CDS as shown in Scenarios 1 and 2 is more expensive than out-of-County haul as shown in Scenarios 3 and 4. A potentially larger risk is the financing for required improvements at CDS and potentially the West Expansion Area. The County will likely not be able to secure financing for the required improvements without waste flow commitments from the cities. Financial institutions require assurances that any loans, typically in the form of bonds, are secure through projected revenues. In the case of a waste management system, they look to waste flow control commitments from the facility users to guarantee tonnage and thus revenues to the system for debt repayment. Before considering any level of financial commitment, the County needs to consider why it would take on additional financial risk without any commitment from the cities.

In summary, the pros and cons of in-County disposal at the CDS include:

Pros

- More direct control of future disposal capacity
- More direct control of disposal cost
- Consistent with the current ColWMP
- Support from the LTF and the public that attended the input meetings

Cons

- Is more costly than out-of-County haul and disposal
- Will require flow control commitments from cities to support the financing of required improvements
- It is unknown if the RWQCB will permit the CDS or West Expansion Area for future disposal
- After re-opening Central, there is a possibility of future regulatory prohibitions could be instituted, causing unplanned immediate closure or restrictions; this could dramatically drive up costs

Out-of-County Haul and Disposal

In response to the lack of regulatory permitted landfill capacity, the County has recently contracted for out-of-County haul and disposal through three separate companies for a five-year period beginning September 1, 2005. This was necessitated by the current RWQCB prohibition on expansion of the CDS. Even if a permit to expand was granted soon,

it could take 2 to 3 years to develop the infrastructure (design, bidding, construction, etc.) to accept waste at the new cell.

The County is in a somewhat favorable position in regards to out-of-County haul and disposal. The County operates and maintains a series of transfer stations that allows for direct transfer to an out-of-County disposal site. The transfer stations may need some minimal capital improvements if the out-haul scenario was considered for the long-term; however, the County owns the front-end transfer infrastructure and thus capital cost improvements will be minimal. Another positive factor is that the County owns the sites and is already permitted to operate these transfer facilities, so no additional site acquisition, regulatory or permitting activities are anticipated. The economic analysis indicated that the out-haul scenarios are less expensive when compared to in-County disposal. Although flow control may be important for in-County disposal commitment, it is less critical than for the scenarios that rely on development of out-of-County haul and disposal, as very little capital investment is required and the operating costs are more easily reduced should tonnage leave the disposal portion of the System.

The potential downside to out-of-County haul and disposal is the risk of losing disposal capacity sometime in the future. Although the County may contract for certain capacity, there is no assurance that this capacity will always be available. As discussed above, the ColWMP dictates the future use of in-County disposal. Long-term out-of-County haul and disposal would require amendment of the ColWMP and compliance with the California Environmental Quality Act (CEQA). The LTF supports in-County disposal as well.

In summary, the pros and cons of out-of-County haul and disposal include:

Pros

- Less expensive than in-County disposal
- Very little capital improvement funds required
- Transfer station infrastructure in place
- No additional regulatory/permitting actions needed
- Requires somewhat fewer flow control commitments
- More flexible from an operational and operating cost standpoint
- Could help develop rail infrastructure for Sonoma County

Cons

- Not consistent with the current ColWMP; ColWMP will need amending and CEQA compliance
- Not supported by the LTF and by the public attending the public input meetings
- Potential loss of ultimate control over disposal capacity; have some protection through strong enforceable contract rights



Executive Summary

- Although the County has contracts, it could be held “hostage” as to future capacity and cost issues

Recommendations

By contracting for out-haul over the short-term five year period, the County has time to address the future management of the System. There are many strategic issues that need timely review, discussion, and decisions. Although the County may have disposal contracts for the next five years, in reality it has very little time to maneuver itself into an acceptable position for managing its solid waste. Recommendations are described below.

Determine Extent and Form of System Participation. The first and most important task for the County is defining the make-up of the disposal System. The County needs to work with the cities to garner their commitment to the disposal System. This includes selecting the appropriate institutional arrangements (County continues as lead agency, new or modified Joint Powers Agency, etc.) and developing necessary contractual commitments with the cities to continue allowing them to be part of the disposal System. If the County does not receive commitment from the cities, they will need to assess the amount of waste and sources that will remain in the disposal System. Assuming unincorporated county and self-haul tonnage, the disposal System should retain approximately 50% of its waste. If this scenario presents itself, the County will need to reform the disposal System infrastructure, which may include such service reductions as closing certain transfer stations, reducing days and hours of other transfer stations, and reducing disposal and reducing diversion plans according to reduced available funds. In addition, in-County disposal is not feasible at the 50% waste level scenario due to the projected higher per ton costs and the potential difficulty in obtaining financing for a smaller waste commitment.

Joint Decision Making. Long-term participation in the disposal System will likely entail giving the cities a voice through appropriate contractual and institutional arrangements and voting protocols to assist in disposal System decisions regarding cost, diversion, and disposal. Cities that opt not to make long-term, contractual commitment to the disposal System must be dropped from consideration as appropriate. Side contracts for diversion, transfer or other activities can still be considered by non-disposal System cities for a contractually specified scope, timeframe and specified cost, if advantageous to the County and participating municipalities. The cities need to commit their tonnage for a specific duration before the County can move forward in the selection and implementation of future options. These decisions should be made jointly with the partnering cities. In future contractual and financial issues the risks must be shared with all parties. This also includes sharing the rewards, such as lower disposal costs (through economies of scale), as well as higher diversion rates, through shared programs and facilities. The County should set a schedule to secure commitments for contractual flow control from the cities, as feasible by the Summer of 2006, so that it can stay on track to achieve its goals. This schedule was derived as is shown in Table ES-6, the Action Plan, as the County has many time sensitive steps to take to put plans in-place to properly manage Sonoma County’s solid waste.

Disposal System Infrastructure Reformation (as needed). As discussed above, if the County cannot garner waste flow control commitments from the cities, and the participation rate falls to approximately 50%, reformation of the disposal System will be required. Understanding the current situation, the County should continue negotiations with the cities for flow control. However, if no agreement is in sight by the Summer of 2006, the County will need to move ahead, assuming the resultant County waste stream is only about half of its current size. If this is the case, a detailed evaluation of the necessity, benefit and cost of each service currently offered along with a prioritization of service cuts and cost reduction activities to bring County costs in line with available financial resources will need to be developed. This plan will need to be designed with specific steps annotated for providing services to accommodate a much smaller waste stream.

Recovery of Unfunded Liabilities. Sufficient monies for the closure and post-closure care of CDS have not been accrued by the County. For those cities that choose not to participate in the joint disposal System, the County needs to negotiate a plan to recover the non-participants' shares of money for closure and post-closure activities at the CDS. If voluntary negotiations are not successful, cost recovery through legal mechanisms will be necessary.

Reduce & Recycle and Zero Waste Plans. Regardless of the long-term disposal method selected, it makes environmental sense to reduce the amount of waste requiring disposal. As shown in the economic analysis, the NPVs of the combined expenses over a 20-year period for incorporating the Zero Waste plans are less than that for the scenarios that do not incorporate the Zero waste plans. This is due to a reduction in waste needing to be handled through transfer and disposal operations. The cost for the implementation of the Zero Waste plans is more than offset by the savings for handling the difference in tonnage. The economic analysis of these programs from a cost per ton perspective yields the opposite result. The fewer number of tons (through diversion) that are available to cover fixed disposal System expenses yields a higher cost per ton. As the disposal tip fee cannot feasibly support this higher cost per ton for the programs, other support fee structures need to be implemented. Governments can fund services through user fees, general taxes, special taxes, and property assessments. The fees for these programs could be placed on the users through the "up-front" collection of waste and recyclables. The "up-front" collection charge would not help cover costs for the self-haul portion of the waste stream. Recognizing that currently, about 37% of the waste for disposal is received from self-haulers, a separate user fee at the disposal site might be needed for this segment of the waste stream. The County could also consider instituting a tax or an assessment on property, although this would require a ballot measure. The County needs to seriously consider these other funding mechanisms for waste reduction, recycling and zero waste plans and programs, as funding through the disposal tip fee is impractical. It should be noted that, the level of Zero Waste program implemented will likely have to be reduced significantly if the cities do not participate financially in the program.



Executive Summary

Combining this approach with out-of-County disposal provides more direct cost savings through reduced haul costs and disposal charges at someone else's disposal site. After determining the participating jurisdictions in the Sonoma County Waste Management System, the participants should create a task force to specifically look into the details of each recommended reduction, recycling, and zero waste plan component. Individual plan components should be designed and approved and then set-up for specific bidding. After actual bids are received for the components of the plan, the participating System member agencies can decide feasibility for adoption and implementation.

In-County Disposal. As discussed above, development of in-County disposal capacity may not be achievable with regard to regulatory acceptance. However, if a large segment (at least approximately 80% as shown through the economic analyses of this Study) of the waste stream can be committed through flow control agreements, and there is buy-in by the cities to finance and operate an in-County disposal site, the County should proceed with this development. This would include further negotiations with the RWQCB for permitting disposal capacity at the CDS and preparing to issue bonds supported by the System members for capital improvements. However, the County needs to plan for its future to be consistent with other goals and activities, so if the County does not have majority support for the regulatory and financial requirements of this activity and are unsuccessful in gaining approvals from the RWQCB by the Summer of 2007, the recommendations involving long-term out-of-County disposal, as described below must be pursued. In addition, as discussed previously, in-County disposal is not feasible at the 50% waste level scenario due to the projected higher per ton costs and the potential difficulty in obtaining financing for a smaller waste commitment. Thus, if waste commitments from the cities are not garnered to at least reach the 80% participation level, the County will need to implement plans for long-term out-of-County haul and disposal.

Out-of-County Haul & Disposal. The County has two basic options for out-haul and disposal: highway vehicle transfer or waste-by-rail (WBR) transfer. A number of out-of-state disposal sites have extremely large amounts of disposal capacity available. In addition, according to some of the operators, they are currently willing to make financially attractive deals for guaranteed long-term waste deliveries. If rail is not already developed to their disposal site, some rail operators indicated their willingness to financially support the inter-modal infrastructure requirements on the disposal site side of the rail transport system.

Our initial assessment of WBR for the County indicates that it may be feasible. Preliminary cost estimates show that rail haul may be economically competitive with highway transfer and disposal. The first step in this process is for the County to discuss future potential WBR operations with the North Coast Rail Authority (NCRA). It will be incumbent on the NCRA to present an operational plan including all fiscal information and a schedule for implementation that supports long-term success of WBR. This should occur by late-2007. The County in conjunction with the NCRA should next initiate a formal competitive procurement process by issuing an RFP. A competitive procurement process is usually the

best method for obtaining the most reasonable offers. The procurement process should specifically solicit rail, as well as highway transfer vehicle transport.

Potential Private Ownership and/or Operation of CDS. If the cities provide no financial or contractual support for future County operations at the CDS, out-of-County haul and disposal as discussed above should be pursued. In parallel with these activities, the County should also explore potential sale of the CDS to a private owner/operator. The private owner/operator may be able to work with the RWQCB to garner approval for capacity development. The private operator may also have available internal funds to finance infrastructure improvements at the CDS. Either way, if the County decides not to pursue continued development and operation itself at the CDS, they should consider allowing a private company to investigate potential feasible options.

The first step is for the County to complete an independent valuation of the CDS from the perspective of a private owner/operator. This will allow the County to better understand the assets and liabilities of the CDS. Before initiating any procurement process, the County may want to contact potential landfill owners and operators to gauge their interest. The County should also solicit their ideas for terms and conditions of any sale/operations agreement. In any event, if there is a reasonable degree of interest, the County may want to release a request for proposals (RFP) document to allow for competitive proposals. After reviewing proposals, the County will be in the position to decide whether to pursue the sale/operations of the CDS. Contract development and negotiations regarding future County and cities use, liabilities, etc. will be one of the most critical components of this option. This activity could occur in parallel with pursuit of long-term out-of-County haul and disposal as discussed in the following paragraph. The County should set a date of late-2007 to make a decision on the sale and/or operations of the CDS to a private company. The sale of other County solid waste facilities such as the transfer stations could also be considered, however appropriate long-term contracts for use of the facilities would need to be completed.

Reassessment of Materials Recovery Facility (MRF). This study concluded that although a MRF would be helpful in handling non-source separated mixed materials generated by the County's residents and businesses; currently a MRF isn't economically feasible. The cost for developing and operating the MRF cannot be currently offset through savings by diverting materials from disposal. In addition, without the County being supported by the local cities through flow control commitments, the financing of such a facility could be difficult as financial institutions always look to these commitments for security in repayment of the bond proceeds.

The County should however continue to reassess developing a MRF, as technology advances, equipment costs decrease, and transportation and disposal costs increase. Implementation of a materials recovery facility could make economic sense in the next few years.

Review Conversion Technologies. Conversion technologies, technologies that convert waste into useful by-products such as fiber, compost, and energy may be beneficial to the



Executive Summary

County in the near future. Although most are currently only in the pilot stage, careful monitoring of these technologies and advancements should not be forgotten. There are a number of studies currently being conducted (City and County of LA, Santa Cruz County, and the Salinas Valley Solid Waste Authority) and pilot plants being planned (Sacramento, San Francisco, etc.). Implementation of a conversion technology could be a good alternative for the County, especially if the CDS remains closed. The County should monitor the progress of these studies and conduct a formal reconsideration in 2 to 3 years; in enough time that the results can be used in the big decisions regarding long term out-haul. In fact, the County could include this as an option (just as rail haul) in the RFP for long-term waste management.

Action Plan

A detailed action plan, including steps, beginning and ending dates, and notes is included as Table ES-6.

Executive Summary

Table ES-6 | Action Plan

Line	Action Plan Steps	Begin	End/Deadline	Notes
1	I. Implement short-term out-of-county haul and disposal	September-05	August-10	Assumes to continue for approximately 5 years
2	II. Continue permit process for Rock Extraction Area with Water Board	Current	July-06	Approximately 5 years of capacity at current tonnage levels
3	III. Continue permit process for East Canyon Area with Water Board	Current	July-06	Approximately 6 years of capacity at current tonnage levels
4	IV. Continue permit process for North Canyon Area with Water Board	Current	July-06	Approximately 3 years of capacity at current tonnage levels
5	V. Adopt and implement zero-waste policies	Current	On-going	Will reduce amount of waste to be landfilled
6	VI. Work with cities to obtain participation commitments	Current	July-06	Need decision whether in or out of system for future planning & funding
7	A. If a majority of cities agree to participate by deadline	July-06	July-06	Need at least 80% of total waste stream
8	1. Form a joint decision making body	July-06	October-06	Give representation and voice to all cities on future waste plans
9	a. Continue permit process for Rock Extraction Area with Water Board	July-06	July-07	On at least REA, however better to work all three areas at same time
10	b. Continue permit process for East Canyon Area with Water Board	July-06	July-07	On at least REA, however better to work all three areas at same time
11	c. Continue permit process for North Canyon Area with Water Board	July-06	July-07	On at least REA, however better to work all three areas at same time
12	i. Develop and submit expansion designs for review and approval by Water Board	July-06	July-07	Assumes designs on all three areas
13	If Water Board approves permit application(s) by deadline	July-07	July-07	Require all three areas permitted
14	Check economic feasibility of Water Board requirements	July-07	September-07	If Water Board requirements are too expensive, may be unfeasible
15	If economically feasible	September-07	September-07	If Water Board requirements are too expensive, may be unfeasible
16	(a) Finalize design and specifications	October-07	January-08	On at least REA, however better to work all three areas at same time
17	(b) Obtain remainder of permits and approvals	February-08	January-09	On at least REA, however better to work all three areas at same time
18	(c) Procure construction company	February-09	May-09	On at least REA, however better to work all three areas at same time
19	(d) Begin construction	June-09	May-10	On at least REA, however better to work all three areas at same time
20	(e) Finalize Construction/Begin operations	May-10	September-10	On at least REA, however better to work all three areas at same time
21	(f) Begin permit process with Water Board for West Canyon expansion	October-07	October-07	Approximately 32 years of capacity at current tonnage levels
22	If Water Board denies permit application by deadline or the project is not economically feasible	July-07	July-07	Any of the three areas
23	Develop long-term out-of-county haul and disposal plans	July-07	December-07	Update long-term solid waste plans
24	Finalize flow control agreements with cities to specify tonnage for haul and disposal bids	July-07	September-07	Requires cities to decide whether in or out for future development & financing
25	Re-evaluate feasibility of developing MRF(s)	July-07	December-07	Re-examine MRF feasibility to reduce tonnage before long-haul
26	If MRF(s) is feasible			
27	(a) Design and permit	December-07	April-09	16 months for design & permitting (depends on compnent selection)
28	(b) Construct	May-09	May-10	12 month construction period (depends on compnent selection)
29	(c) Begin operations	May-10	May-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
30	Re-evaluate feasibility of developing conversion technology(ies)	July-07	December-07	Re-examine conversion tech feasibility to reduce tonnage before long-haul
31	If conversion technology(ies) is feasible			
32	(a) Design and permit	December-07	April-09	16 months for design & permitting (depends on compnent selection)
33	(b) Construct	May-09	May-10	12 month construction period (depends on compnent selection)
34	(c) Begin operations	May-10	May-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
35	Obtain long-term out-haul permits & prepare EIR	January-08	January-09	Assumes 12 months to obtain EIR/permits
36	Amend County Solid Waste Management Plan	January-09	July-09	Assumes acceptance as no other option may be available
37	Procure bids for haul and disposal with option for rail haul	August-09	February-10	Assumes 6 month bid process
38	Select and negotiate with company to provide haul and disposal services	March-10	May-10	Assumes 2 months for negotiations
39	Begin out-haul operations	September-10	September-10	Assumes operation by end of short-term hauling & disposal contract
40	B. If none or less than a majority of cities agree to participate by deadline	Current	July-06	Assumes approximately 50% of total waste stream
41	1. Conduct study of County infrastructure reformation	July-06	October-06	Study details how to sturcture County with half its waste stream
42	2. Initiate restructuring plans	October-06	October-06	
43	3. Consider sale of CDS to private companies	November-06	November-06	Private company to own/operate CDS; work with Water Board for permitting
44	4. Develop long-term out-of-county haul and disposal plans	December-06	December-07	Update long-term solid waste plans
45	5. Finalize flow control agreements with cities to specify tonnage for haul and disposal bids	December-06	February-07	Requires cities to decide whether in or out for future development & financing
46	6. Re-evaluate feasibility of developing MRF(s)	December-06	December-07	Re-examine MRF feasibility to reduce tonnage before long-haul
47	a. If MRF(s) is feasible			
48	Design and permit	January-08	May-09	16 months for design & permitting (depends on compnent selection)
49	Construct	June-09	June-10	12 month construction period (depends on compnent selection)
50	Begin operations	June-10	June-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
51	7. Re-evaluate feasibility of developing conversion technology(ies)	December-06	December-07	Re-examine conversion tech feasibility to reduce tonnage before long-haul
52	a. If conversion technology(ies) is feasible			
53	Design and permit	June-09	June-10	16 months for design & permitting (depends on compnent selection)
54	Construct	June-10	June-10	12 month construction period (depends on compnent selection)
55	Begin operations	December-06	December-07	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
56	8. Obtain long-term out-haul permits & prepare EIR	January-08	January-09	Assumes 12 months to obtain EIR/permits
57	9. Amend County Solid Waste Management Plan	January-09	July-09	Assumes acceptance as no other option may be available
58	10. Procure bids for haul and disposal with option for rail haul	August-09	February-10	Assumes 6 month bid process
59	a. Select and negotiate with company to provide haul and disposal services	March-10	May-10	Assumes 2 months for negotiations
60	b. Begin out-haul operations	September-10	September-10	Assumes operation by end of short-term hauling & disposal contract
61	VII. Negotiate with cities for recovery of unfunded liabilities	Current	On-going	Recover monies to cover closure and post-closure activities
62				



This page left blank.

Section 1

Introduction

Brown, Vence and Associates, Inc. (BVA) was retained by the Sonoma County Department of Transportation and Public Works (County) to conduct a Study to assess an array of short- and long-term alternatives for management of Sonoma County's waste. Sonoma County's waste is currently managed through the Countywide Solid Waste Management System (System) consisting of solid waste facilities and programs throughout Sonoma County for the cities, as well as unincorporated county residents and businesses. The goal of this Study was to develop, analyze, and evaluate these alternatives to support the County and the System in meeting its objective of providing Sonoma County residents and businesses with environmentally sensitive and cost-effective disposal and diversion options.

In 2003, the County Integrated Waste Management Plan (CoIWMP) was adopted by the County of Sonoma and all nine cities in Sonoma County. The CoIWMP described two main waste management objectives: 1) meet 50 percent diversion of solid waste disposal in 2003 and 70 percent diversion in 2015 based on 1990 disposal rates and 2) be able to provide the needed disposal capacity to accommodate population growth through 2018. During the short-term period of 2003-2008, the CoIWMP calls for development of siting criteria for a new landfill. The CoIWMP plan is for 50 years of disposal capacity. For the longer term period 2009-2018, the CoIWMP calls for the siting process to continue with information being fully disclosed to the public. Procedures for selection or elimination of sites was also planned to be developed.

Since the CoIWMP was adopted in 2003, several developments have occurred within the System that directly affects the decisions regarding Sonoma County's short- and long-term solid waste management objectives. These include:

- The loss of Petaluma's waste stream and associated disposal System revenues; other jurisdictions have indicated that they are looking at their disposal options which may or may not include use of the disposal System.
- In response to contamination under a portion of the lined landfill at the Central Disposal Site (CDS) and potential groundwater issues, the integrity of the liner system came into question. As a result, the current Regional Water Quality Control Board (RWQCB) permit was revised to prohibit any new landfill expansion at the CDS, until control and reduction of leachate and landfill gas is demonstrated, and a new liner system is approved. The County has aggressively implemented additional monitoring and control measures and levels of contamination are now reduced to extremely low levels. We understand that no contamination is migrating off of the landfill site. However, as a result of the permit revision, the County has stopped accepting waste at the CDS for landfill disposal effective September 2005.

These developments have caused:



Section 1

- Loss of revenues to pay for System costs
- Increase in landfill tipping fees
- Direct export of waste out-of-County, and
- Jurisdictions exploring other alternatives for solid waste management.

Although these new developments and constraints may cause certain concerns for the County, they also provide an opportunity for Sonoma County to re-assess its short- and long-term solid waste management plans. These plans must now consider these new issues and must include providing long-term cost effective diversion and disposal options, as indicated in the CoIWMP.

The report is divided into 8 separate sections.

- Section 1 contains a general introduction to the Study.
- Background information and assumptions for the Countywide System are described in Section 2 to provide the basis for analysis.
- Section 3 presents waste stream projections for Sonoma County. These projections were used to develop appropriately sized alternatives and evaluate the Study economics, as well as the projected diversion and disposal amounts.

The remaining sections describe selection, analysis, and evaluation of the alternatives and scenarios considered for management of solid waste in Sonoma County.

- Section 4 describes the development of twelve screening and evaluation criteria. These were developed through discussions with County staff and public meetings of the AB 939 Local Task Force (LTF). This section also describes the process for evaluating, scoring, and ranking the alternatives.
- Section 5 details the development of five short-term and eight long-term alternatives to manage Sonoma County's solid waste through discussions with County staff and public LTF meetings. It also provides detailed analysis of each alternative considered, as well as the scoring of the alternatives.
- Section 6 discusses the process of ranking the alternatives scored in Section 5 with input from the LTF. The ranking of alternatives is taken into consideration in development of thirteen integrated system scenarios. The integrated system scenarios were developed by combining alternatives that complemented each other and provided options for overall management of Sonoma County's solid waste through programs, plans, and facilities for diversion and disposal.
- Section 7 describes the process used to narrow down the thirteen system scenarios into four concise economic scenarios for evaluation. Economic pro formas were developed and comparatively analyzed for each scenario. Two sensitivity analyses defining 50% and 80% levels of disposal System participation by the jurisdictions

within Sonoma County were evaluated for each economic scenario to determine the effect upon disposal System economics.

- The results of the preferred scenarios and a recommended action plan to implement the scenarios are presented in Section 8.

BVA conducted several background analyses to support the Study. These analyses are included in the appendices of the report. They include: 1) a survey of other similar county systems and landfills throughout California, 2) a review of mandatory collection for Sonoma County, and 3) a feasibility assessment for waste-by-rail haul in Sonoma County.



Section 1

This page left blank.

Section 2

Background Information and Assumptions

Introduction

This section briefly describes the background of solid waste management in Sonoma County. Background information will be used as a basis to conduct the Assessment of Long-Term Solid Waste Management Alternatives for Sonoma County. The background information is presented in three separate sections below. These include: 1) description of the current Sonoma Countywide Solid Waste Management System (System), 2) description of the objectives of the 2003 County Integrated Waste Management Plan (CIWMP) and 3) current developments, constraints, and opportunities pertaining to the handling of solid waste in Sonoma County. A detailed description of the history of the System is included in Appendix A.

Description of System

Solid Waste Collection

Solid waste generated in Sonoma County is handled by 11 licensed or franchise hauling companies. Each of these franchised and licensed companies has specified operational territories within Sonoma County. These are described below:

- Cloverdale Disposal (subsidiary of Waste Management) – North Central Unincorporated County, Cloverdale
- Empire Waste Management (subsidiary of Waste Management) – East Unincorporated County, Healdsburg, Petaluma
- Industrial Carting – Lake Sonoma Area Unincorporated County
- Larry's Sanitary Service (subsidiary of Waste Management) – South West Unincorporated County, Sebastopol, Cotati
- Pacific Coast Disposal (subsidiary of North Bay Corporation) – North Coastal Unincorporated County
- Rohnert Park Disposal (subsidiary of North Bay Corporation) – Rohnert Park
- Santa Rosa Recycling & Collection Service (subsidiary of North Bay Corporation) – Santa Rosa
- Sonoma Garbage Collector – Unincorporated County Near Sonoma, Sonoma
- Sunrise Garbage Service (subsidiary of North Bay Corporation) – Russian River Area Unincorporated County



Section 2

- West Sonoma County Disposal (subsidiary of North Bay Corporation) – West Area Unincorporated County
- Windsor Refuse & Recycling (subsidiary of North Bay Corporation) – Windsor

The haulers collect solid waste, wood and yard waste, and recyclables from the curbside and deliver them to the facilities discussed below. Commercial collection currently (2005 estimates) generates approximately 63% of the waste stream requiring the handling of materials for disposal at Sonoma County Department of Transportation and Public Works (County) facilities, while the remaining 37% is self-hauled to County facilities by the general public and businesses for disposal.

Recycling

Curbside recyclables and wood and yard waste are collected by the haulers discussed above and delivered to one of the County's disposal facilities or one of the two privately operated materials recovery facilities (MRFs) in Santa Rosa. Recyclables are processed at the MRFs, consolidated, and sold to markets. The Central Disposal Site (CDS) contains a composting facility that accepts the wood and yard waste materials delivered directly to it and from the transfer stations producing a compost product available to markets. In addition, Recycling-Reuse Centers are located at the Healdsburg and Sonoma Transfer Stations and CDS. The CDS Tipping Facility conducts floor sort activities recovering scrap metal, old corrugated cardboard (OCC), and other recyclable materials.

Solid Waste Disposal/Transfer Facilities

Existing solid waste facilities operated by the County include the Central Disposal Site (landfill portion recently closed in September 2005), and four operating transfer stations. In addition, there are seven other closed landfill sites throughout Sonoma County. Figure 2-1 shows the locations of the solid waste facilities. The transfer stations include Annapolis, Guerneville, Sonoma, and Healdsburg. The Occidental transfer station, shown on Figure 2-1, has been recently closed. All of these sites are located at former landfills. The transfer stations receive and consolidate materials from four areas throughout Sonoma County. Materials consolidated at these sites are currently being transported by approximately 100 cubic yard long-haul transfer trucks to out-of-County disposal sites. The public tipping facility at the CDS receives waste directly from its near-by wasteshed. Identification of wastesheds, permitted capacity, average daily loading, and yearly operation information regarding these facilities is identified below. This information was referenced from the Facility Capacity Component of the ColWMP.

Section 2

- Permitted transfer facility capacity: 1,050 TPD
- Operating days per year: 359
- **Annapolis Transfer Station**
 - Wasteshed: Northwest Unincorporated County, Community of Annapolis, Community of Sea Ranch
 - Permitted capacity: 50 TPD
 - Operating days per year: 228
- **Guerneville Transfer Station**
 - Wasteshed: Russian River Area Unincorporated County, Community of Guerneville, Community of Monte Rio
 - Permitted capacity: 160 TPD
 - Operating days per year: 359
- **Healdsburg Transfer Station**
 - Wasteshed: Northern Unincorporated County, Cloverdale, Healdsburg, Town of Windsor, Community of Geyserville
 - Permitted capacity: 435 TPD
 - Operating days per year: 359
- **Sonoma Transfer Station**
 - Wasteshed: Southeast Unincorporated County, Sonoma
 - Permitted capacity: 760 TPD
 - Operating days per year: 359

Solid Waste System Costs

Tipping fees at the Central Disposal Site for solid waste disposal were \$70 per ton in FY 2004/05. Operational costs for the CDS landfill were estimated to be approximately \$41 per ton of that amount. The remaining costs include:

- Handling of household hazardous waste
- Education and diversion planning
- County diversion costs
- Out of Sonoma County transport and disposal
- Operations and environmental compliance for the transfer stations
- Capital improvements at the transfer stations
- Capital improvements at the disposal sites (including closed sites)
- Engineering for other system capital projects
- System administration
- Litter control
- Reserve fund for Central closure
- Central post-closure
- Other landfills post-closure, and
- Operating reserves.

Solid Waste System Agencies and Responsibilities

The Sonoma County Waste Management Agency (SCWMA) is the regional agency for the cities and unincorporated areas of Sonoma County. The SCWMA's purpose is to implement, monitor, and report programs to meet and maintain the waste diversion goals established by AB 939. AB 939 dictated that every city and county must meet 50 percent diversion. In 2002, the SCWMA applied for and was approved for a three-year time extension to achieve the goal. As of 2001, the achieved diversion rate was 41 percent. The County has recently completed a new base year study for 2003, which was reviewed and approved by the California Integrated Waste Management Board (CIWMB) that determined the achieved diversion rate to be 56%.



Section 2

The delegation of responsibility for the Countywide Solid Waste Management System (System) is as follows.

- SCWMA is responsible for public educational materials and information, regional wood waste processing and yard debris composting, beverage container recycling for local public access, funding for diversion programs, and Sonoma County hazardous waste programs. These responsibilities are in addition to maintaining AB 939 planning documents and the CoIWMP.
- Cities are responsible for collection and all jurisdiction specific programs whereas the County is responsible for collection in unincorporated areas.
- Sonoma County AB 939 Local Task Force (LTF) is the advisory committee to the SCWMA and Sonoma County Board of Supervisors. Its responsibility is to provide advice and assistance in preparation and ongoing development of solid waste management programs in Sonoma County.
- Sonoma County Health Services Department, Environmental Health Division is the designated Local Enforcement Agency (LEA) for CIWMB permits.
- The County of Sonoma is the owner of all the solid waste disposal and transfer facilities in Sonoma County and is responsible for all facility related activities.

2003 CoIWMP Objectives

The 2003 CoIWMP described two main waste management objectives: 1) meet 50 percent diversion of solid waste disposal in 2003 and 70 percent diversion in 2015 based on 1990 disposal rates and 2) be able to provide the needed disposal capacity to accommodate population growth through 2018. The proposed plans are described below.

CoIWMP Diversion Plan

The following is the planned strategy to achieve and maintain at least 50 percent diversion. The status of each item is noted in *“italics”*.

- Continue existing programs that resulted in achieving the current diversion rate. *Existing programs are being continued.*
- Expand existing single-family curbside collection from a 3-cart system to single-stream. Currently implemented Countywide with the exception of the Cities of Petaluma and Cloverdale. *Cloverdale implemented single-stream curbside recycling in 2005. Petaluma is implementing its single-stream curbside program in 2006.*
- Expand and implement multi-unit curbside collection programs to ensure all residents have recycling services. *Currently being addressed in all urban areas of Sonoma County.*

Background Information and Assumptions

- Expand existing yard waste collection to weekly from bi-weekly. Currently implemented Countywide with the exception of the Cities of Petaluma and Cloverdale. *Cloverdale implemented weekly yard waste collection in 2005. Petaluma is implementing their weekly yard waste collection program in 2006.*
- Expand existing County reuse and recovery operations to recycle additional materials. *Added gypsum (wall board) to list of materials accepted at the CDS.*
- Implement new beverage container recycling. *Has been implemented; collection containers continue to be added at various locations.*
- Expand existing County disposal site floor-sort activities. *Has been implemented limited floor sorting at the CDS; not at transfer stations.*
- Implement a construction and demolition (C&D) debris diversion program to complement existing private sector programs. *The C&D diversion program has been suspended at the CDS due to a private C&D recycler developing a full-scale operation in Santa Rosa and absorbing the Central Disposal Site's C&D tonnage.*

No detailed information is available at this time showing the impact of current implementation of these ColWMP diversion plans. However, as discussed in Section 3, tonnage disposed at the CDS amounted to 483,344 tons in 2003. Current projections show a significant decrease to an estimated 372,200 tons expected for 2005. Although some of this decrease is attributed to the loss of most of the City of Petaluma's tonnage, a large portion of the decrease was due to an increase in recycling and reuse programs and additional diversion from the community.

ColWMP Disposal Capacity

The SCWMA has the objective of facilitating waste diversion efforts through a variety of programs which include source reduction, reuse, recycling, composting, and disposal. Not until all program changes, as mentioned above, are implemented, will the extent of waste reduction, and therefore necessary disposal, be determined. However, during the short-term period of 2003-2008, the ColWMP calls for development of siting criteria for a new landfill. The plan is for 50 years of disposal capacity.

For the period 2009-2018, the ColWMP calls for the siting process to continue with information being fully disclosed to the public. Procedures for selection or elimination of sites will also be developed.

ColWMP Planning Summary

Program implementation by the responsible solid waste management agencies for Sonoma County will determine the ability to meet diversion rate goals and thus dictate the capacity needs of the System. The specific programs were developed and presented in a report from the www.recyclenow.org - SCWMA Web site; "Sonoma County Countywide Integrated Waste Management Plan including the Source Reduction and Recycling Element,



Section 2

Household Hazardous Waste Element, Siting Element, and the Non-Disposal Facility Element”, prepared by the SCWMA for the jurisdictions of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park Santa Rosa, Sebastopol, Sonoma, Windsor, and the County of Sonoma, October 15, 2003. We have listed the programs included below:

- **Source reduction programs**
 - Local government programs
 - Technical assistance, education, and promotion
 - Rate structure modification
 - Regulatory programs
 - Economic incentives
 - Monitoring and evaluation
 - **Recycling programs**
 - Drop-off/buy-back program
 - Single-family curbside program
 - Multi-unit program
 - Commercial source-separation program
 - Office paper recovery program
 - Recycled materials procurement program
 - Materials reuse/recovery program
 - Floor-sort activities
 - Monitoring and evaluation
 - **Composting programs**
 - Yard debris composting
 - Monitoring and evaluation
 - **Special waste programs**
 - Construction and demolition debris programs
 - Tire program
 - White and brown goods program
 - Wood waste recovery program
 - Monitoring and evaluation
 - **Education and public information programs**
-

- Programs
- Monitoring and evaluation

Current Developments

Since the CoIWMP was issued and approved in 2003, several developments have occurred within the System that directly effect the decisions regarding Sonoma County's short- and long-term solid waste management objectives. These include:

- The loss of Petaluma's waste stream and associated disposal System revenues; other jurisdictions have indicated that they are looking at their disposal options which may or may not include use of the disposal System.
- In response to the detection of Volatile Organic Compounds (VOCs) in samples collected from the underdrain located beneath a portion of the lined Landfill 2 (East Canyon) at the Central Disposal Site (CDS) and the potential of these constituents to affect underlying groundwater, the integrity of the liner system came into question by the Regional Water Quality Control Board (RWQCB). In addition, leachate mounding in the unlined Landfill 1 (Central Canyon) has caused concern regarding the potential for leachate migration from Landfill 1. As a result, the RWQCB revised the County's Waste Discharge requirements to prohibit any new landfill expansion at the CDS, until control and reduction of leachate and landfill gas is demonstrated, and a new liner system is approved. The County has aggressively implemented additional monitoring and control measures and reduced levels of VOCs in Landfill 2 to extremely low levels. We understand that no contamination is migrating off of the landfills site. However, as a result of the permit prohibition on expansion, the County has stopped accepting waste at the CDS for landfill disposal effective September 2005.

These developments have caused:

- Loss of revenues to pay for System costs
- Increase in landfill tipping fees
- Direct export of waste out-of-county, and
- Jurisdictions exploring other alternatives for solid waste management.

Although these new developments and constraints may cause certain concerns for the County, they also provide an opportunity for Sonoma County to re-assess its short-and long-term solid waste management plans. These plans must now consider the new issues and must include providing long-term cost effective diversion and disposal options, as indicated in the CoIWMP.



Section 2

This page left blank.

Section 3

Waste Stream Projections

Introduction

Waste stream projections were developed based on information gathered from the Countywide Integrated Waste Management Plan (ColWMP), the California Integrated Waste Management Board (CIWMB) Reports for 2001 and 2002, the 2000 Sonoma County Source Tonnage Summary, the 1995/96 Sonoma County Waste Characterization Study, the 2003 Solid Waste Generation Study for AB939 Base Year Adjustments, and 2005 actual Sonoma County Department of Transportation and Public Works (County) waste disposal data. This information was used to allocate waste disposed, diverted, and generated by franchised hauler and self-hauler and by jurisdiction. It also allowed for generation of two separate waste stream projections, one following the ColWMP projections, the other based on updated actual disposal figures. These two projections provide a range of the possible waste quantities requiring management through 2025 and needing further analysis during the Assessment of the Long Term Solid Waste Management Alternatives for Sonoma County.

ColWMP Based Projections Approach

Information from the 2003 ColWMP's Disposal Capacity Requirements, Table 4-43, page 4-166 provided the base disposal, diversion, and generation information for this analysis. The disposal figures include all tons disposed at the Central Disposal Site as well as those tons exported out of Sonoma County to other disposal facilities. The diversion figures include all tons diverted including those attributed to transformation. The total disposed plus the total diverted was summed to calculate the total waste generated within the County on an annual basis. The ColWMP projected these figures through 2018 using the CIWMB's Diversion Rate Calculation Worksheet. The worksheet uses information on population, taxable sales, employment, and Consumers Price Index (CPI) projections. The projections developed for this analysis were estimated through 2025. The average growth rates for disposal and waste generation from 2017 to 2018 (approximately 0.95% and 3%, respectively) were used to escalate and project figures from 2018 through 2025.

Using information from the 2000 Source Tonnage Reports, which identifies the amounts of waste disposed by jurisdiction throughout Sonoma County, the total waste defined in the ColWMP was allocated by jurisdiction. The percentages of waste disposed in year 2000 for each jurisdiction was applied to the total ColWMP amounts for each year. A further allocation was made between franchise hauler and self-haul disposed waste tonnage, by using the split identified in the 1995/96 Waste Stream Characterization Study, Table 3.2.3, page 9. The characterization study shows that approximately 76.2% of the waste is attributable to franchise haulers and 23.8% to self-haulers. Diversion figures were not broken down by hauler.



Section 3

Information for these projections was used directly from the ColWMP as discussed above. These ColWMP based projections are shown in Table 3-1 below. These projections show a total of 485,000 tons being disposed in 2004 escalating to 592,781 tons by 2025. Likewise the total projected diversion in 2004 is 505,569, and in 2025, 1,246,532; for generation a total of 990,569 tons projected for 2004 and 1,839,312 in 2025. It should be noted that full City of Petaluma waste disposal figures (prior to their leaving the disposal System) are shown in Table 3-1, as represented in the 2003 ColWMP.

Updated Waste Disposal Projections

Updated waste disposal figures were projected using recent data from the 2003 SCWMA funding allocation worksheet as well as actual in-county disposal data for 2005. Tonnage disposed at the CDS amounted to 483,344 tons in 2003, as reported in the SCWMA figures. Actual disposal data from 2005 predicts that approximately 372,200 tons could be disposed at the CDS or other County designated disposal sites in 2005. These figures are much lower than those predicted using the ColWMP based projections. The projected decrease in tonnage landfilled at the CDS or other County designated disposal sites for 2005 is due to the loss of the majority of the City of Petaluma's tonnage as well as an increase in recycling and reuse programs and additional diversion from the community. The figures from franchise hauler and self haul users as well as by jurisdiction were allocated through use of the 2003 SCWMA figures. These figures show that approximately 68.5% of the waste was disposed by franchise haulers (including debris box waste) in 2003. Accordingly, approximately 31.5% was disposed by self-haulers in 2003. Figures adjusted for projected 2005 disposal show that approximately 63% of the waste is anticipated to be delivered by franchise haulers, while approximately 37% is anticipated to be delivered by self-haulers. Projections for waste disposal beyond 2005 were based on estimated population growth, off-set by future anticipated diversion. For the analysis, an increase in disposal of 0.95% per year as shown in the ColWMP was assumed for 2006 through 2025. The results of this analysis are shown in Table 3-2.

Using information from the 2003 ColWMP's Disposal Capacity Requirements, Table 4-43, page 4-166, diversion rates were projected. In the ColWMP table, the disposal rate was shown to increase approximately 0.95% per year, while the overall waste generation rate was shown to increase at about 3% per year. Applying these two factors to actual disposal figures for 2003 and the approved CIWMB 56% diversion rate for 2003, diversion rates of 65% for 2015 and 70% by 2022 were projected. Although the goal stated in the ColWMP is to reach 70% diversion by 2015 based on 1990 rates, implementation of the ColWMP factors applied to the actual 2003 disposal figures yields only about 65% diversion by 2015.

Summary

The Updated Waste Disposal Projections will be used for further analyses in this Study. The amount disposed in 2005 is estimated to be approximately 372,200 tons, escalating to

Waste Stream Projections

approximately 449,679 tons in 2025. In addition, the lower diversion rate calculated from 2003 disposal data, the CIWMB approved diversion rate of 56% and ColWMP growth rates of 65% in 2015 were assumed in this Study.



Waste Stream Projections

**Table 3-1
Sonoma County
ColWMP Waste Projections**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<u>County-wide (tons)</u>												
Total Disposed	510,000	485,000	490,000	494,700	499,400	504,200	509,000	513,900	518,800	523,800	528,800	533,900
Total Diversion	<u>452,273</u>	<u>505,569</u>	<u>529,670</u>	<u>554,635</u>	<u>580,517</u>	<u>607,522</u>	<u>635,284</u>	<u>664,241</u>	<u>693,688</u>	<u>724,465</u>	<u>756,197</u>	<u>789,108</u>
Total Generated	962,273	990,569	1,019,670	1,049,335	1,079,917	1,111,722	1,144,284	1,178,141	1,212,488	1,248,265	1,284,997	1,323,008
<u>Disposal - Franchised Hauler (tons)</u>												
Unincorporated	105,268	100,108	101,140	102,110	103,080	104,071	105,062	106,073	107,084	108,116	109,148	110,201
Santa Rosa	139,777	132,925	134,296	135,584	136,872	138,187	139,503	140,846	142,189	143,559	144,930	146,327
Petaluma	51,456	48,934	49,438	49,913	50,387	50,871	51,355	51,850	52,344	52,849	53,353	53,868
Sonoma	13,036	12,397	12,524	12,645	12,765	12,887	13,010	13,135	13,260	13,388	13,516	13,646
Rohnert Park	24,873	23,654	23,898	24,127	24,356	24,590	24,825	25,064	25,303	25,546	25,790	26,039
Healdsburg	16,337	15,536	15,697	15,847	15,998	16,151	16,305	16,462	16,619	16,779	16,939	17,103
Cotati	5,399	5,135	5,188	5,237	5,287	5,338	5,389	5,441	5,493	5,546	5,598	5,652
Sebastopol	11,900	11,316	11,433	11,543	11,652	11,764	11,876	11,991	12,105	12,222	12,338	12,457
Cloverdale	5,768	5,485	5,542	5,595	5,648	5,703	5,757	5,812	5,868	5,924	5,981	6,039
Windsor	<u>14,805</u>	<u>14,079</u>	<u>14,225</u>	<u>14,361</u>	<u>14,497</u>	<u>14,637</u>	<u>14,776</u>	<u>14,918</u>	<u>15,061</u>	<u>15,206</u>	<u>15,351</u>	<u>15,499</u>
Totals	388,620	369,570	373,380	376,961	380,543	384,200	387,858	391,592	395,326	399,136	402,946	406,832
<u>Disposal - Self-Haul (tons)</u>												
Unincorporated	32,879	31,267	31,590	31,893	32,196	32,505	32,815	33,130	33,446	33,769	34,091	34,420
Santa Rosa	43,657	41,517	41,945	42,348	42,750	43,161	43,572	43,991	44,411	44,839	45,267	45,703
Petaluma	16,072	15,284	15,441	15,590	15,738	15,889	16,040	16,195	16,349	16,507	16,664	16,825
Sonoma	4,071	3,872	3,912	3,949	3,987	4,025	4,063	4,103	4,142	4,182	4,222	4,262
Rohnert Park	7,769	7,388	7,464	7,536	7,607	7,680	7,754	7,828	7,903	7,979	8,055	8,133
Healdsburg	5,103	4,853	4,903	4,950	4,997	5,045	5,093	5,142	5,191	5,241	5,291	5,342
Cotati	1,686	1,604	1,620	1,636	1,651	1,667	1,683	1,699	1,716	1,732	1,749	1,765
Sebastopol	3,717	3,535	3,571	3,605	3,639	3,674	3,709	3,745	3,781	3,817	3,854	3,891
Cloverdale	1,802	1,713	1,731	1,748	1,764	1,781	1,798	1,815	1,833	1,850	1,868	1,886
Windsor	<u>4,624</u>	<u>4,398</u>	<u>4,443</u>	<u>4,485</u>	<u>4,528</u>	<u>4,572</u>	<u>4,615</u>	<u>4,660</u>	<u>4,704</u>	<u>4,749</u>	<u>4,795</u>	<u>4,841</u>
Totals	121,380	115,430	116,620	117,739	118,857	120,000	121,142	122,308	123,474	124,664	125,854	127,068
<u>Diversions (tons)</u>												
Unincorporated	113,513	126,889	132,938	139,204	145,700	152,477	159,445	166,713	174,103	181,828	189,792	198,052
Santa Rosa	176,619	197,432	206,843	216,593	226,700	237,246	248,087	259,395	270,895	282,914	295,305	308,158
Petaluma	40,102	44,828	46,965	49,179	51,474	53,868	56,330	58,897	61,508	64,237	67,051	69,969
Sonoma	15,473	17,296	18,121	18,975	19,861	20,784	21,734	22,725	23,732	24,785	25,871	26,997
Rohnert Park	30,675	34,289	35,924	37,617	39,372	41,204	43,087	45,051	47,048	49,135	51,288	53,520
Healdsburg	20,712	23,153	24,257	25,400	26,585	27,822	29,093	30,419	31,768	33,177	34,631	36,138
Cotati	7,894	8,824	9,245	9,680	10,132	10,604	11,088	11,593	12,107	12,645	13,198	13,773
Sebastopol	16,812	18,793	19,689	20,617	21,579	22,583	23,615	24,691	25,786	26,930	28,110	29,333
Cloverdale	8,221	9,190	9,628	10,082	10,552	11,043	11,548	12,074	12,609	13,169	13,745	14,344
Windsor	<u>22,252</u>	<u>24,875</u>	<u>26,060</u>	<u>27,289</u>	<u>28,562</u>	<u>29,891</u>	<u>31,257</u>	<u>32,682</u>	<u>34,130</u>	<u>35,645</u>	<u>37,206</u>	<u>38,825</u>
Totals	452,273	505,569	529,670	554,635	580,517	607,522	635,284	664,241	693,688	724,465	756,197	789,108

Waste Stream Projections

**Table 3-1
Sonoma County
ColWMP Waste Projections**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<u>County-wide (tons)</u>											
Total Disposed	539,000	544,200	549,400	554,644	559,938	565,283	570,678	576,125	581,624	587,176	592,781
Total Diversion	<u>823,423</u>	<u>857,658</u>	<u>894,340</u>	<u>932,240</u>	<u>971,746</u>	<u>1,012,926</u>	<u>1,055,852</u>	<u>1,100,596</u>	<u>1,147,237</u>	<u>1,195,854</u>	<u>1,246,532</u>
Total Generated	1,362,423	1,401,858	1,443,740	1,486,884	1,531,684	1,578,209	1,626,530	1,676,722	1,728,861	1,783,030	1,839,312
<u>Disposal - Franchised Hauler (tons)</u>											
Unincorporated	111,254	112,327	113,401	114,483	115,576	116,679	117,792	118,917	120,052	121,198	122,355
Santa Rosa	147,725	149,150	150,575	152,013	153,464	154,928	156,407	157,900	159,407	160,929	162,465
Petaluma	54,382	54,907	55,432	55,961	56,495	57,034	57,578	58,128	58,683	59,243	59,808
Sonoma	13,777	13,910	14,043	14,177	14,312	14,449	14,586	14,726	14,866	15,008	15,151
Rohnert Park	26,288	26,541	26,795	27,051	27,309	27,570	27,833	28,098	28,367	28,637	28,911
Healdsburg	17,266	17,433	17,599	17,767	17,937	18,108	18,281	18,455	18,632	18,809	18,989
Cotati	5,706	5,762	5,817	5,872	5,928	5,985	6,042	6,100	6,158	6,217	6,276
Sebastopol	12,576	12,698	12,819	12,941	13,065	13,190	13,315	13,443	13,571	13,700	13,831
Cloverdale	6,096	6,155	6,214	6,273	6,333	6,393	6,454	6,516	6,578	6,641	6,704
Windsor	<u>15,647</u>	<u>15,798</u>	<u>15,949</u>	<u>16,101</u>	<u>16,255</u>	<u>16,410</u>	<u>16,567</u>	<u>16,725</u>	<u>16,884</u>	<u>17,046</u>	<u>17,208</u>
Totals	410,718	414,680	418,643	422,639	426,673	430,745	434,857	439,008	443,198	447,428	451,699
<u>Disposal - Self-Haul (tons)</u>											
Unincorporated	34,749	35,084	35,419	35,757	36,098	36,443	36,791	37,142	37,497	37,854	38,216
Santa Rosa	46,140	46,585	47,030	47,479	47,932	48,390	48,852	49,318	49,789	50,264	50,744
Petaluma	16,986	17,149	17,313	17,479	17,645	17,814	17,984	18,155	18,329	18,504	18,680
Sonoma	4,303	4,345	4,386	4,428	4,470	4,513	4,556	4,599	4,643	4,688	4,732
Rohnert Park	8,211	8,290	8,369	8,449	8,530	8,611	8,693	8,776	8,860	8,944	9,030
Healdsburg	5,393	5,445	5,497	5,549	5,602	5,656	5,710	5,764	5,819	5,875	5,931
Cotati	1,782	1,800	1,817	1,834	1,852	1,869	1,887	1,905	1,923	1,942	1,960
Sebastopol	3,928	3,966	4,004	4,042	4,081	4,120	4,159	4,199	4,239	4,279	4,320
Cloverdale	1,904	1,922	1,941	1,959	1,978	1,997	2,016	2,035	2,055	2,074	2,094
Windsor	<u>4,887</u>	<u>4,934</u>	<u>4,981</u>	<u>5,029</u>	<u>5,077</u>	<u>5,125</u>	<u>5,174</u>	<u>5,224</u>	<u>5,274</u>	<u>5,324</u>	<u>5,375</u>
Totals	128,282	129,520	130,757	132,005	133,265	134,537	135,821	137,118	138,427	139,748	141,082
<u>Diversion (tons)</u>											
Unincorporated	206,665	215,257	224,464	233,976	243,891	254,227	265,000	276,230	287,936	300,138	312,857
Santa Rosa	321,558	334,927	349,252	364,053	379,480	395,562	412,325	429,798	448,012	466,998	486,788
Petaluma	73,012	76,047	79,300	82,660	86,163	89,815	93,621	97,588	101,724	106,035	110,528
Sonoma	28,171	29,342	30,597	31,894	33,245	34,654	36,123	37,653	39,249	40,912	42,646
Rohnert Park	55,847	58,169	60,657	63,227	65,907	68,700	71,611	74,646	77,809	81,107	84,544
Healdsburg	37,709	39,277	40,957	42,693	44,502	46,388	48,354	50,403	52,539	54,765	57,086
Cotati	14,372	14,969	15,610	16,271	16,961	17,679	18,429	19,209	20,024	20,872	21,757
Sebastopol	30,608	31,881	33,245	34,653	36,122	37,653	39,248	40,912	42,645	44,453	46,336
Cloverdale	14,967	15,590	16,256	16,945	17,663	18,412	19,192	20,006	20,853	21,737	22,658
Windsor	<u>40,514</u>	<u>42,198</u>	<u>44,003</u>	<u>45,867</u>	<u>47,811</u>	<u>49,837</u>	<u>51,949</u>	<u>54,151</u>	<u>56,446</u>	<u>58,838</u>	<u>61,331</u>
Totals	823,423	857,658	894,340	932,240	971,746	1,012,926	1,055,852	1,100,596	1,147,237	1,195,854	1,246,531



Section 3

**Table 3-2
Sonoma County
Updated Net Waste Projections**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<u>County-wide (tons)</u>												
Total Disposed - In County	483,344	427,772	372,200	375,736	379,305	382,909	386,546	390,219	393,926	397,668	401,446	405,260
<u>Disposal - Franchised Hauler (tons)</u>												
Unincorporated	58,763	58,218	57,672	58,220	58,773	59,332	59,895	60,464	61,039	61,619	62,204	62,795
Santa Rosa	145,520	113,377	81,233	82,005	82,784	83,570	84,364	85,166	85,975	86,791	87,616	88,448
Petaluma	38,880	21,116	3,352	3,384	3,416	3,448	3,481	3,514	3,548	3,581	3,615	3,650
Sonoma	10,022	10,790	11,558	11,668	11,779	11,891	12,004	12,118	12,233	12,349	12,466	12,585
Rohnert Park	27,840	29,604	31,368	31,666	31,967	32,271	32,577	32,887	33,199	33,514	33,833	34,154
Healdsburg	10,879	10,585	10,292	10,390	10,488	10,588	10,689	10,790	10,893	10,996	11,101	11,206
Cotati	6,262	5,862	5,463	5,515	5,567	5,620	5,674	5,727	5,782	5,837	5,892	5,948
Sebastopol	10,615	10,699	10,784	10,886	10,990	11,094	11,200	11,306	11,413	11,522	11,631	11,742
Cloverdale	6,684	6,367	6,049	6,106	6,164	6,223	6,282	6,342	6,402	6,463	6,524	6,586
Windsor	15,539	16,127	16,715	16,874	17,034	17,196	17,359	17,524	17,691	17,859	18,028	18,200
Totals	331,003	282,745	234,486	236,714	238,963	241,233	243,525	245,838	248,174	250,531	252,911	255,314
<u>Disposal - Self Haul (tons)</u>												
Unincorporated	58,745	51,180	43,614	44,028	44,447	44,869	45,295	45,725	46,160	46,598	47,041	47,488
Santa Rosa	42,751	41,854	40,956	41,345	41,738	42,134	42,535	42,939	43,347	43,758	44,174	44,594
Petaluma	15,323	15,380	15,438	15,585	15,733	15,882	16,033	16,185	16,339	16,494	16,651	16,809
Sonoma	5,012	4,772	4,531	4,574	4,617	4,661	4,706	4,750	4,795	4,841	4,887	4,933
Rohnert Park	4,564	3,996	3,429	3,462	3,494	3,528	3,561	3,595	3,629	3,664	3,698	3,734
Healdsburg	10,743	11,114	11,485	11,594	11,704	11,815	11,928	12,041	12,155	12,271	12,387	12,505
Cotati	2,379	2,339	2,300	2,322	2,344	2,366	2,389	2,411	2,434	2,457	2,481	2,504
Sebastopol	6,332	5,976	5,619	5,672	5,726	5,781	5,836	5,891	5,947	6,003	6,061	6,118
Cloverdale	2,100	2,462	2,823	2,850	2,877	2,904	2,932	2,960	2,988	3,016	3,045	3,074
Windsor	4,391	5,955	7,519	7,590	7,663	7,735	7,809	7,883	7,958	8,033	8,110	8,187
Totals	152,341	145,028	137,714	139,022	140,343	141,676	143,022	144,381	145,753	147,137	148,535	149,946

Waste Stream Projections

**Table 3-2
Sonoma County
Updated Net Waste Projections**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<u>County-wide (tons)</u>											
Total Disposed - In County	409,110	412,996	416,920	420,880	424,879	428,915	432,990	437,103	441,256	445,447	449,679
<u>Disposal - Franchised Hauler (tons)</u>											
Unincorporated	63,392	63,994	64,602	65,215	65,835	66,460	67,092	67,729	68,373	69,022	69,678
Santa Rosa	89,289	90,137	90,993	91,858	92,730	93,611	94,500	95,398	96,304	97,219	98,143
Petaluma	3,684	3,719	3,755	3,790	3,826	3,863	3,899	3,937	3,974	4,012	4,050
Sonoma	12,704	12,825	12,947	13,070	13,194	13,319	13,446	13,573	13,702	13,833	13,964
Rohnert Park	34,479	34,806	35,137	35,471	35,808	36,148	36,491	36,838	37,188	37,541	37,898
Healdsburg	11,313	11,420	11,529	11,638	11,749	11,860	11,973	12,087	12,202	12,317	12,434
Cotati	6,005	6,062	6,119	6,178	6,236	6,295	6,355	6,416	6,477	6,538	6,600
Sebastopol	11,853	11,966	12,080	12,194	12,310	12,427	12,545	12,664	12,785	12,906	13,029
Cloverdale	6,649	6,712	6,776	6,840	6,905	6,971	7,037	7,104	7,171	7,239	7,308
Windsor	18,373	18,547	18,723	18,901	19,081	19,262	19,445	19,630	19,816	20,004	20,194
Totals	257,739	260,188	262,660	265,155	267,674	270,217	272,784	275,375	277,992	280,632	283,298
<u>Disposal - Self Haul (tons)</u>											
Unincorporated	47,939	48,394	48,854	49,318	49,787	50,260	50,737	51,219	51,706	52,197	52,693
Santa Rosa	45,017	45,445	45,877	46,313	46,753	47,197	47,645	48,098	48,555	49,016	49,482
Petaluma	16,969	17,130	17,293	17,457	17,623	17,790	17,959	18,130	18,302	18,476	18,652
Sonoma	4,980	5,028	5,075	5,124	5,172	5,221	5,271	5,321	5,372	5,423	5,474
Rohnert Park	3,769	3,805	3,841	3,877	3,914	3,952	3,989	4,027	4,065	4,104	4,143
Healdsburg	12,624	12,744	12,865	12,987	13,111	13,235	13,361	13,488	13,616	13,745	13,876
Cotati	2,528	2,552	2,576	2,601	2,626	2,650	2,676	2,701	2,727	2,753	2,779
Sebastopol	6,176	6,235	6,294	6,354	6,414	6,475	6,537	6,599	6,662	6,725	6,789
Cloverdale	3,103	3,132	3,162	3,192	3,223	3,253	3,284	3,315	3,347	3,379	3,411
Windsor	8,265	8,343	8,422	8,502	8,583	8,665	8,747	8,830	8,914	8,999	9,084
Totals	151,371	152,809	154,260	155,726	157,205	158,699	160,206	161,728	163,265	164,816	166,381



Section 3

This page left blank.

Section 4

Screening Methodology and Evaluation Criteria

Criteria Development

In order to assist Sonoma County in solving its short- and long-term solid waste management objectives, a strategy was developed to screen and evaluate a list of potential alternatives. The initial step in this process was to develop and define criteria to evaluate alternative waste management scenarios. After discussion with Sonoma County Department of Transportation and Public Works (County) staff, BVA used the criteria identified and approved as part of the Solid Waste Management Alternatives Analysis Project in December 2000 as a starting point for criteria development. These initial draft criteria were presented at a public meeting of the AB939 Local Task Force (LTF) on October 14, 2004. Each criterion was discussed and some were modified by agreement from members of the LTF during the meeting. At the same meeting draft weights for each of the twelve criteria were discussed. The LTF discussed the weight for each criterion and agreed upon and adopted the weights used in the analysis.

The original list of criteria in the 2000 Alternatives Study included:

- Operating History
- Siting Element Exclusionary Standards
- Wastestream Applicability
- Relevance to Solid Waste Management System
- Consistency with AB 939 Waste Management Hierarchy
- Distribution of Economic Benefits and Impacts
- Environmental Consequences
- Role of Public Sector Entities
- Regulatory Liability and Exposure
- Disposal Needs and Obligations
- Capital Costs
- Operating Costs
- Cost per Ton
- Siting, Design, Permitting and Construction Requirements
- Ownership/Operation Responsibilities



Section 4

- Environmental Impacts

Using this list of criteria and understanding the County's current solid waste management system's constraints and changed conditions since 2000, twelve screening and evaluation criteria were developed and agreed upon by the LTF at the October 14, 2004 meeting described above. These criteria are listed and defined for alternative evaluation purposes below.

- **Operating History** – What has been the alternative's track record in terms of performance, including the term of operation for handling a waste stream of the size and type of the County's? Is the alternative safe? How reliable has the alternative historically been in handling waste? Has it been used as a normal industry standard for handling waste?
 - **Diversion Potential & Consistency with AB 939 Waste Management Hierarchy** – What is the diversion potential of the alternative? What have been the historic levels of diversion achieved for a typical waste stream and the types of materials diverted? How is this alternative consistent with the State's AB 939 Waste Management Hierarchy? Does the alternative contribute to educating the public about diverting waste? Does the alternative have potential impact on the long-term viability of working towards a zero waste goal? Does the alternative use the highest and best use of materials in diversion processes?
 - **Distribution of Economic Benefits and Impacts, and Social Equity** – What are the potential economic benefits and impacts of the alternative? These impacts could include the potential for creating and maintaining employment or growth opportunities for residents, businesses, and industries within the County. Does the alternative improve social equity?
 - **Environmental Consequences** – What are the potential negative environmental impacts associated with development or implementation of the alternative? What are the potential mitigation measures? What are the positive environmental benefits from implementing an alternative? Does the alternative generate environmental justice issues?
 - **Role of Public Sector Entities & JPA Participation Potential** – Does the alternative maintain the authority of the County, the jurisdictions, the Sonoma County Waste Management Agency (referred to as JPA), other similar non-regulatory public institutions, political units or governmental bodies in managing the County's solid waste system? Is there potential for the alternative to affect participation by the JPA and its members?
 - **Regulatory Cooperation** – What are the potential regulatory risks and exposure from implementation of the alternative? What are the financial, legal, or potential policy impacts and can they can be managed or controlled? Does the alternative provide potential opportunities for regulatory cooperation?
-

- **Disposal Needs and Obligations** – What are the disposal requirements of the alternative? Does the alternative reduce the need for disposal? Will the alternative assist the County in meeting its disposal capacity needs? Is the disposal alternative within the County? What level of disposal capacity does the alternative provide? Are there capacity risks associated with the alternative?
- **Capital Costs** – What is the capital cost of the alternative? Describe the capital components of the alternative and the range of costs attributable to the alternative. What is the operating life of these capital components? Is financing available for these capital components?
- **Operating Cost** – What is the operating cost for the alternative? Describe the operating cost components of the alternative and the range of costs attributable to the alternative. Are there options available to reduce the operating cost?
- **Cost per ton** – What is the overall cost per ton for the alternative? This includes amortized capital costs, annual operating costs, and netting out of projected revenues (if applicable). The net annual cost is then divided by the estimated number of tons handled by the alternative.
- **Siting, Design, Permitting, and Construction Requirements (reflecting time and cost necessary to implement alternative)** – What are the necessary steps to develop and implement the alternative including any required siting, design, permitting, and special construction related requirements? What are the time requirements and costs necessary to implement the alternative?
- **Effect on Current System Costs** – How will implementing the alternative impact the current system costs? Will system costs increase or decrease?

Scoring and Weighting

In the next phase of the Study each of the alternatives was analyzed in detail and evaluated according to the criteria listed above. Each of the alternatives received a score from 1 to 5 for each criterion, depending on how consistent they were with the goals and objectives of the finalized criteria, updated from the 2000 Solid Waste Management Alternatives Analysis. The scores were assigned as follows:

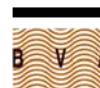
Score of 5 – Exceeds Criteria's Objectives

Score of 4 – Partially Exceeds Criteria's Objectives

Score of 3 – Meets Criteria's Objectives

Score of 2 – Meets Some Criteria's Objectives

Score of 1 – Does Not Meet Criteria's Objectives



Section 4

In addition, each of the criteria received a weight. The weights for each criterion were developed and agreed upon at the public LTF meeting on October 14, 2004 as discussed above. As described in Section 5 of the report, the weights were multiplied by the scores received from each criterion and summed by alternative (i.e. there were twelve weighted and scored criterion summed for each alternative). Proposed weights based on 100 points of total weighting are shown in Table 4-1 below:

Table 4-1| Criteria Weights

Criteria	Weight (pts)
Operating History	6
Diversion Potential/Consistency with AB 939 Hierarchy	14
Distribution of Economic Benefits and Impacts, and Social Equity	6
Environmental Consequences	10
Role of Public Sector Entities & JPA Participation Potential	7
Regulatory Cooperation	7
Disposal Needs and Obligations	9
Capital Costs	6
Operating Cost	7
Cost per ton	9
Siting, Design, Permitting, and Construction Requirements	9
Effect on Current System Costs	10
Totals	100

Section 5

Alternatives Analysis

Introduction

Brown, Vence & Associates, Inc. (BVA) in cooperation with Sonoma County Department of Transportation and Public Works (County) staff identified eleven potential alternatives for handling Sonoma County's solid waste stream. These alternatives were divided into those that could be considered short-term (implemented within the next three to five years) or long-term (implemented five or more years into the future). It should be noted that these alternatives are not in any priority order or mutually exclusive, and were used in combination with overall integrated system scenarios to address potential solutions to Sonoma County's waste handling issues later in the Study. The alternatives include:

Short-Term Alternatives

- Alternative 1 – Exporting of Solid Waste Outside of Sonoma County
- Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste
- Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse and Recycling
- Alternative 4 – Expansion of Central Disposal Site
- Alternative 5 – Subregional Waste System

Long-Term Alternatives

- Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul
- Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs
- Alternative 6 – Development of West Expansion Area
- Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County
- Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste
- Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Handle Source Separated and Non-Source Separated Recyclable
- Alternative 10 – Development of an Organics Processing Facility
- Alternative 11 – Privatization of All or Part of the Solid Waste System



Section 5

All of these alternatives were analyzed in the 2000 Alternatives Analysis Project, which supported the 2003 ColWMP, with the addition of four new alternatives:

- Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste
- Alternative 5 – Subregional Waste System
- Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste, and
- Alternative 11 – Privatization of All or Part of the Solid Waste System.

Each alternative was analyzed and evaluated using the previously developed criteria. Draft alternatives and their definitions were presented at the public AB 939 Local Task Force (LTF) meeting on October 14, 2004. LTF members reviewed the alternatives and provided comments that were incorporated as appropriate into the alternatives analyzed below. At the public LTF meeting on December 9, 2004, results of the analysis including the scoring and ranking of alternatives were presented to the LTF for review and comment. Also on December 9, 2004, the alternatives and the analysis were presented during a general public meeting. Comments and questions were taken and incorporated into the final alternatives analysis presented below. It should be noted that Alternatives 1 and 3 were analyzed and evaluated as both short-term and long-term alternatives and have been repeated in the text twice to discuss both the short- and long-term impacts. We have included the complete analysis and evaluation of each alternative below.

Short-Term Alternatives

Alternative 1 – Exporting of Solid Waste Outside of Sonoma County

Analysis

In response to contamination under a portion of the lined landfill at the Central Disposal Site (CDS) and potential groundwater issues, the integrity of the liner system came into question. As a result, the current Regional Water Quality Control Board (RWQCB) permit was revised to prohibit any new landfill expansion at the CDS, until control and reduction of leachate and landfill gas is demonstrated, and a new liner system is approved. The County has aggressively implemented additional monitoring and control measures and levels of contamination are now reduced to extremely low levels. We understand that no contamination is migrating off of the landfill site. However, as a result of the permit revision the County has stopped accepting waste at the CDS for landfill disposal effective September 2005. Understanding that there were no other operating landfills in Sonoma County, besides the landfill at the CDS, exporting of solid waste outside of Sonoma County was required.

On October 12, 2004, the County Board of Supervisors (Board) authorized the distribution of a Request for Proposals (RFP) to obtain competitive proposals for the transport and/or

disposal of Sonoma County's solid waste at one or more out-of-County landfills. On January 13, 2005, an Addendum to the RFP was sent to all interested parties extending the proposal submittal deadline until February 15, 2005, and responding to 59 questions about the RFP.

The County received six proposals by the February 15 deadline as follows:

- Empire Waste Management/Redwood Landfill (hauling and disposal)
- Allied Waste Keller Canyon Landfill (disposal only)
- Norcal Waste System Hay Road Landfill (hauling and disposal)
- West Sonoma County Disposal Service/Potrero Hills/Vasco Landfills (hauling and disposal)
- Western Waste Solutions Russell Pass Landfill (disposal only)
- Yolo County Central Landfill (disposal only)

A team of staff from Transportation and Public Works, County Counsel, County Administrator, Auditor-Controller, Treasurer-Tax Collector, and General Services was assembled to review and evaluate the proposals. Following an initial review to confirm the proposals met RFP requirements, interviews were conducted with Empire Waste Management (EWM) and Keller Canyon Landfill Company (KCLC) on March 23, 2005, and with Norcal Waste Systems and West Sonoma County Disposal Service (WSCD) on March 25, 2005, in order to clarify elements of their proposals and ask additional questions.

Based on the analysis of the proposals and the interviews conducted by staff, staff recommended, and the Board approved, agreements with EWM, KCLC, and WSCD as necessary for implementing the out-haul program.

Note that although waste is being hauled out-of-County for at least the short-term, the County incurs and will continue to incur costs related to past disposal. At a minimum, closure and post-closure costs for older portions of the landfill at the CDS and other closed landfills that had been used in the past by all generators are disposal System costs that should be borne by all past, current, and future solid waste generators in Sonoma County. Other costs such as the cost of the rural site transfer system (or its alternative, illegal disposal) are also disposal System costs that should be borne by Sonoma County present and future users. This issue is analyzed in detail under Alternative 2 and Appendix B.

Evaluation

A. Operating History – Score 5

Transport to out of area sites, and landfill disposal have a long and proven track record and is the industry standard. Landfill disposal is the best of several options for final disposal of solid waste, and is cited in the AB 939 hierarchy as preferable to transformation. Landfill disposal is not completely safe and, among other impacts can result in contamination to soil



Section 5

and groundwater, but these risks to the County can be minimized through strong risk transference and sound operative practices.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 3

This alternative should not impact diversion objectives, plans or activities at the current contractual minimum tonnage commitments. Low cost landfilling; however, may impede the implementation of more expensive diversion programs.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 2

This alternative results in reduced jobs, income, and investment locally. Curtailed disposal at Central will result in loss of positions. These impacts can be mitigated to the extent that a preference is given for transporters that are headquartered in Sonoma County and/or that hire locally.

D. Environmental Consequences – Score 2

Export of solid waste will result in environmental impacts both during transport and during disposal. To some extent these impacts can be reduced. Transport results in air quality and traffic congestion impacts, some of which will occur local and some outside of the county. Out-of-county air impacts are functions of the roundtrip distance for transport and the relative per-mile fuel requirements for each route depending on the types of road.

Disposal has real environmental consequences such as use of land, greenhouse gas emissions, traffic impacts around the site, etc. Disposal also has potential environmental consequences such as groundwater and soil contamination, local air quality impacts, etc. In addition, not all sites can provide equal assurances regarding environmental risk. The result may be cost and environmental trade-offs such as selecting a disposal site(s) that are more distant but safer. From a liability standpoint, most of the risks of disposal of Sonoma County solid waste can be minimized through negotiated contract provisions in the County's disposal contracts with the private landfills.

Environmental justice concerns may arise depending on the transport route (locally and out-of-County) and the disposal site location, with relation to poor and minority populations. Also, see discussion under Criteria K regarding impact of possible concerns that may be raised by the host county (ies).

E. Role of Public Sector Entities and JPA Participation Potential – Score 4

The alternative maintains the authority of the County, the jurisdictions, and the JPA and can be implemented with no change in current organizational roles or responsibilities within Sonoma County. The alternative, by buying time for development of long-term sustainable alternatives that maximize diversion, has some potential to increase opportunities for cooperation and shared responsibility among the various parties.

However, some form of near-term commitment of the waste stream to the disposal System, as discussed under Alternative 2, will likely improve the export disposal price per-ton that all disposal System users will pay.

F. Regulatory Cooperation – Score 3

This alternative may help buy additional time to address the concerns of the RWQCB, but otherwise does not have appreciable impact on regulatory cooperation.

G. Disposal Needs and Obligations – Score 3

The alternative does not add to disposal need, and thus is neutral in impact with regard to this criterion.

H. Capital Costs – Score 3

Transport firms may need to incur capital costs such as purchase or lease of vehicles, and any such costs will be included in the per-ton transport fee. The selected disposal site operator(s) may need to incur capital expense in order to accept County wastes, and any such costs will be reflected in the negotiated per-ton disposal fee(s). In general, this alternative will create little or no capital expenditure requirements for the County. The County may want to consider expansion of the Tipping Facility at the CDS in the short-term. The majority of vehicles that currently utilize the landfill at the CDS will now have to utilize the Tipping Facility.

I. Operating Costs – Score 3

Transport and disposal site operating costs are part of the negotiated disposal fee(s) with the contracted hauler(s). Fees are approximately \$41 per ton (2005-06 \$'s) and are very consistent with the most recent operating costs at the CDS landfill, also estimated at approximately \$41 per ton.

Some County operating costs may be reduced since waste will be transported directly from each transfer station to the disposal site rather than first being transported to Central; however, the County will incur administrative costs associated with managing the contract, including disposal and diversion tonnage verification, invoice review and payment, etc.

J. Cost Per Ton – Score 3

The combined cost per ton for transport and disposal is approximately \$41 per ton (2005-06 \$'s), which is consistent with the most recent operating costs at the CDS landfill, also estimated at approximately \$41 per ton.



Section 5

K. Siting, Design, Permitting, and Construction Requirements – Score 4

With regard to timing, this option must be developed quickly. There is just adequate time to conduct the RFP and contracting process if the County proceeds expeditiously following the schedule defined by County staff.

L. Effect on Current System Costs – Score 3

Alternative 1 costs are consistent with that of the most recent estimated operating costs for the landfill at the CDS. To the extent that the disposal System manages and exports reduced tonnages due to decisions by individual jurisdictions to individually export waste for disposal, there will be growing unfunded County expenditures and a corresponding deficit. However, in lieu of implementation of some sort of disposal System charge as discussed in Alternative 2 and Appendix B, there will be the need to address very serious issues such as the legal obligation of all past disposal System users to contribute to closure and post-closure expenses, and the County's ability to maintain a system of transfer stations serving the more rural areas of Sonoma County. Near-term decisions about how much tonnage will be committed to export under the County contract discussed in Alternative 1 forces a beneficial consideration (from the perspective of Sonoma County as a whole) of these issues. Taking into account these disposal System costs, overall costs may not be affected.

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Analysis

Background

The purpose of this alternative is to identify and analyze short-term options for the future role of the Sonoma County Waste Management Agency (Agency) assuming continuation of the current membership. The Agency, as currently constituted, documents AB 939 compliance to the state, plans and implements Countywide programs such as HHW collection and yard debris composting, interacts with County staff and with the Local Task Force in program planning and implementation, and participates in long-term planning processes such as development of the CoIWMP and the Long-Term Solid Waste Alternative Analysis Project. The County is a member of the Agency, which is staffed by County employees. The Agency Board is comprised primarily of member agency staff members and some elected officials. The Agency agreement requires unanimous votes for all actions, on the annual budget, on budget expenditures over \$50,000 and changes to its scope of responsibilities, and thus it only takes one dissenting member to postpone or end consideration of most significant issues.

Historically, all members of the Agency used the County disposal System of transfer stations and landfills for management of waste, and little if any waste was exported from Sonoma County. The Agency agreement does not currently address “flow control”, or commitment of solid waste to the County disposal System. Nor does the County have bilateral agreements with individual jurisdictions that commit delivery of waste. To date, most jurisdictional collection agreements have provided that waste is delivered to the County disposal System, but the City of Petaluma has now accepted a collection proposal, which involves directly transporting collected waste out-of-County. The County's licensed hauler agreements for collection in the unincorporated area require delivery to the County disposal System.

The members of the Agency have for many years benefited from use of the County disposal System. Assuming the feasibility of one or more options for expansion or development of new disposal capacity, as discussed in Alternatives 4, 6, and 7, Agency members can continue to enjoy the benefits that come with the economies of scale associated with larger tonnages and short transport distances.

However, as noted in the analysis of Alternative 1, regardless of whether or not waste leaves the disposal System, the County incurs and will continue to incur costs related to past disposal. These unfunded expenses must be addressed as soon as possible. At a minimum, closure and post-closure costs for older portions of Central Landfill and other closed landfills that had been used in the past by all generators are disposal System costs that should be borne by all past, current, and future solid waste generators in Sonoma County. As noted below, other costs such as the cost of the rural transfer site system (or its alternative, illegal disposal) are also disposal System costs that should be borne by the entire County. Export of waste in the short-term, whether through County contract as described above for Alternative 1, or by decision of individual jurisdictions heightens the need to ensure these costs are met by means other than, or in addition to, County landfill tip fees.

Options for Agency Organization and Responsibility

Numerous solid waste joint powers agencies (JPAs) across the state have substantially larger roles and responsibilities than the Agency currently has. The following is summary information for a sampling of JPAs, and in the case of Santa Barbara County a long-term planning body. Further details regarding these JPAs can be found in Appendix B.

- **Humboldt County.** The Humboldt Waste Management Authority (Authority) is an enterprise fund with its own staff that finances, owns, and contracts for the operation of a transfer station that manages the majority of the waste stream. Solid waste is exported out-of-County for disposal. The Authority is exercising a buy-out clause, and intends to take over full operation of the facility and disposal contracting.
- **Monterey County - Marina Regional Waste Management District.** The District covers the coastal area of the County, owns and operates the Monterey Regional Landfill with



Section 5

its own staff, and contracts for private collection on behalf of its member agencies. The District operates award-winning diversion programs at the MRF located at the landfill.

- **Monterey County - Salinas Valley Solid Waste Authority.** The Authority owns two active landfills that are operated privately under contract and upon pending termination of an existing private sector agreement will also own a transfer station and contract for its operation. The Authority's members contract individually for collection services. The Authority is also responsible for long-term closure/post-closure of several landfills that were formerly County-owned. The Authority also provides AB939 compliance, household hazardous waste, and public education services to its member agencies.
- **Napa County.** The Napa-Vallejo Waste Management Authority (Authority) serves the southern portion of Napa County, and Vallejo in Solano County. The Authority owns a transfer station and contracts for facility operations and export for disposal. The Authority is currently developing a construction and demolition debris recycling program.
- **Santa Barbara County.** Santa Barbara County owns and operates a major landfill and several transfer stations. In 2001, the County and the cities created the Multi-Jurisdictional Solid Waste Task Group. This group evolved from a smaller more informal group with a charge to "provide a forum to discuss and plan countywide long-term solid waste management strategies and facilities." The Group has met on a continuous basis, developed a "Long-Term Solid Waste Management Plan" with a focus on diversion programs. The members are elected officials and the Group has a technical advisory committee with a range of public agency staff.

Understandably, Agency members will probably need resolution of, or at least greater certainty regarding current Regional Water Quality Control Board issues related to the Central Landfill in order to see any benefit to initiate the Sonoma County Waste Management Agency's role in landfill operation.

The following are a range of options that provide a greater role for the existing Agency. The options are not mutually exclusive, or in any particular order. The options reflect various JPA structures, roles, and responsibilities that work effectively around the state.

- Strengthen role of Agency in identifying and recommending jurisdictional diversion programs.
- Restrict representation on the Board to elected officials, with jurisdictional staff serving as a technical advisory committee.
- Modify the voting system to reflect the will of the majority, possibly with some degree of weighting based on population or other characteristics.
- Develop an Agency that is a fully autonomous or nearly fully autonomous from the County, for instance by developing an enterprise fund and providing full staffing.

- Member jurisdictions commitment to cover disposal System costs (long-term landfill closure and post-closure costs) to the County or to the Agency through the JPA agreement.
- Facilitate flow control to the County or to the Agency through bilateral agreements between individual jurisdictions and the County or Agency.
- Form a special district in order to take advantage of taxation powers.

Options for Funding Ongoing System Costs

Jurisdictions with publicly-owned facilities have addressed the issue of unfunded disposal System costs in a variety of ways. Following are sample solutions to the problem.

- **The City of San Diego** levies a franchise fee of \$12 per ton for all waste generated in the city, regardless of where it is disposed. The intent of the fee is to ensure full contribution to closure and post-closure costs for closed portions of the City's Miramar Landfill.
- **Lane County, Oregon** (County seat, Eugene) owns and operates a system of transfer and disposal facilities. In 1998, in the absence of any contractual flow control commercial haulers began to take increasing tonnages out-of-County for disposal. Lane County developed a "system benefit charge" (SBC) to fully fund County programs that was implemented by County ordinance. The SBC stipulates a per-ton surcharge for all tons generated in the County, is part of the system fee at County facilities, and is remitted by all haulers that do not use the County system. The SBC began as the equivalent of \$16 per ton and is now \$17.60, and covers:
 - Closure and post-closure cost for older portions of the landfill that had been used in the past by all generators.
 - The cost of the rural container sites, including the cost of transfer to the landfill, but not the cost of disposal.
 - The entire cost of County recycling and waste prevention programs at the rural sites and at the central transfer station.
 - The entire cost of the special waste and HHW programs, except for disposal costs associated with inadvertent County collection of such wastes at the central transfer station and landfill.
 - The allocated share of County staff and overhead costs directly related to providing the above services.
- **The Mendocino County** disposal stream is exported out-of-County. Mendocino County levies a surcharge of \$4.50 per ton of waste to fund the Mendocino County Solid Waste Authority that manages AB 939 reporting for each of the jurisdictions, and conducts recycling, HHW and e-waste collection, and public education programs. The surcharge applies to all jurisdictions that are Authority members.



Section 5

While each of the above examples involves different circumstances, different types of costs, and use of different but related mechanisms, each jurisdiction's goal was the same; to ensure full funding of specific systems costs, regardless of where waste is disposed. Legal counsel should review the application of an SBC-type charge for applicability of Proposition 218. However, in general most attorneys do not believe that Proposition 218 applies to solid waste charges. Note that:

The entire purpose of an SBC is to create a targeted user fee.

In the case of Lane County, the SBC is a redistribution of existing charges and thus has no direct impact on ratepayers.

Should the County institute an SBC that has an added component(s) to meet previously unfunded expenses and that would thus impact ratepayers, then perhaps Proposition 218 would apply (if at all) to just the new added increment of the charge.

With or without implementation of these options by the Agency, the County needs to fund past liabilities and ongoing disposal System components. Currently, all of the funding for these expenses is being charged through the tipping fees at County disposal sites. With one jurisdiction already leaving the disposal portion of the System and others indicating they are looking at their disposal options, which may or may not include use of the County disposal System, these costs need to be separated from the landfill tipping fee and charged directly to the users. As discussed, these charges are already included in the current tipping fee rate and just require reallocation (not rising). The County needs to carefully assess and appropriately allocate these costs. Costs for current and projected users of the landfill need to be recovered for day-to-day landfill operations; cost for disposal System components and past landfill liabilities need to be allocated and recovered from the responsible jurisdictions. The County needs to finalize the cost allocations and continue discussions with the various jurisdictions regarding the responsible sharing of these costs.

Although, as part of this study we will be reviewing the reduction of the landfill tip fee through reallocation of current fees, the County in cooperation with the JPA members may want to consider the following:

- Conducting a cost of service study to identify, and to accurately and defensibly allocate all expenses that should be considered disposal System costs.
 - Conducting an analysis of County solid waste programs, staffing, and costs to ensure cost-efficiency and appropriateness. The County project team has collected initial information for a range of other California counties with substantial rural areas regarding the number of transfer and disposal facilities in each system, and the days and hours of their operation. Preliminary analysis supports the County staff sense that some cost savings can be realized by reducing days (Sundays as a minimum) and/or hours of operation at several of the transfer sites.
 - Re-examining the fee structure at all facilities, with relation to cost coverage. Identifying any alternative means to cover costs.
-

Evaluation

A. Operating History – Score 5

There are numerous, well-functioning solid waste joint powers agencies in California that have a role and level of responsibility that exceed that of the Agency as currently constituted. Many of these manage waste streams of comparable or greater size. There are successful models for every type of potential change in the Agency.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 4

The diversion effect of a larger role for the Agency is potentially positive, depending on the level of increase in diversion program responsibilities by the Agency.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 3

The economic and social benefits of an expanded role for the Agency are, in and of themselves, neutral. Whether a change in Agency role and/or structure will have a positive or negative impact with regard to this criterion depends on the nature of future decisions made by the Agency.

D. Environmental Consequences – Score 4

The structure of the Agency is at least neutral with regard to environmental impact and mitigation, and social justice issues. But to the extent that the Agency provides a cohesive approach to solid waste planning, there will be reduced environmental impact and fewer or less serious social justice issues as opposed to the County and each jurisdiction moving ahead in their own separate directions.

E. Role of Public Sector Entities and JPA Participation Potential – Score 5

This alternative directly and fully addresses this criterion.

F. Regulatory Cooperation – Score 3

This alternative does not have appreciable impact on regulatory risk or cooperation.

G. Disposal Needs and Obligations – Score 3

This alternative does not, in and of itself, affect short-term disposal needs or obligations. However, the alternative could form the basis for concrete long-term solutions to disposal needs.

H. Capital Costs – Score 3

Not applicable.



Section 5

I. Operating Costs – Score 3

There may be increased costs for the Agency, such as staffing depending on the type and degree of change in its role and responsibilities, but these costs would be offset by savings to the County and possibly other jurisdictions. Certain funds would need to be shifted from the County to the Agency in this process.

J. Cost per Ton – Score 3

This alternative should either have no significant impact on cost per ton, or a slightly positive effect due to economies of scale depending on the type and degree of change in the Agency's role and responsibilities.

K. Siting, Design, Permitting, and Construction Requirements – Score 2

Given the current uncertainties in regard to regulatory issues at Central Landfill and the associated liabilities, it may be difficult to develop consensus for an expanded role for the Agency during the short-term 3 to 5 year planning horizon. However, the timeframe is more than adequate to address the issue of unfunded expenses.

L. Effect on Current System Costs – Score 3

This alternative should either have no significant impact on system costs, or a slightly positive effect due to economies of scale depending on the type and degree of change in the Agency's role and responsibilities. In addition, as part of this alternative system, costs that are not now funded may become funded.

Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse and Recycling

Analysis

The 2003 Countywide Integrated Waste Management Plan (CoIWMP) has identified policies and programs to reach 70 percent diversion by 2015 based on 1990 figures. The County achieved 56 percent diversion in 2003. Applying the generation and disposal projections from the 2003 CoIWMP, as discussed in Section 3 of this Study with the 2003 actual disposal figures and the 56% 2003 diversion figure, a 65% diversion rate was projected for 2015. As an alternative or complement to facility development and exporting of solid waste generated in the County, the County and the Cities should accelerate and enhance their source reduction and recycling plans to maximize diversion.

The County should expand existing and implement new reuse and recycling programs and policies to reach this goal. While programs and policies that divert significant tonnage or have a favorable cost per ton should be obvious priorities, the benefit and cost-effectiveness of reuse and recycling programs cannot be measured by diversion alone. When choosing

among different programs that compete for limited funding, the County should consider programs that meet the following criteria:

- Produce the highest quality product possible for end markets (i.e., for example, processing of organic materials should favor high quality compost suitable for Certified Organic Farming instead of low quality mulch, alternative daily cover, or a process that produces contaminated residues)
- Capture the highest function and use of the product possible, instead of reclaiming materials (i.e., for example, computers programs should implement reuse/repair/re-manufacturing over recycling of the raw materials such as plastic and metals. For wood this means wood reuse over wood grinding for mulch or hog fuel, etc.)

Given these parameters, the following short-term policies and programs were developed at a “planning level” with input from the Local Task Force (LTF) to maximize diversion. Appendix C includes details developed by the LTF for a number of these programs.

Short-term Programs and Policies

- **Accelerate plans for 70 percent diversion goal.** The County through the 2003 ColWMP has established a countywide diversion goal of 70 percent by 2015 based on 1990 figures and has developed a recycling plan that identifies the programs, costs, and funding to reach 70 percent diversion. Recalculation of the diversion rate using 2003 actual disposal figures yields a projected 65% diversion rate. Meeting the 70% diversion goal may be achieved by improved local agency procurement programs, monitor compliance, and staff assistance.
- **Mandatory source-separation.** The County is already in the process of considering a mandatory recycling opportunity ordinance, which would require all residents and businesses to have available access to recycling programs. Additional diversion could be achieved by having all jurisdictions implement a mandatory source-separation ordinance requiring the separation of recyclable materials into the appropriate containers. Aside from the staff time required to develop the ordinance, there are no specific costs associated with the mandatory source-separation ordinance. However, the ordinance may require additional resources for outreach and enforcement. For purposes of evaluating this component, we will assume that the additional resources needed for code compliance and outreach personnel would amount to one full-time equivalent staff person or \$100,000 per year.
- **Landfill bans.** The County has already banned disposal of green waste, wood waste, cardboard, and scrap metal. The County may wish to consider adding materials such as clothing, paper, food waste, and organics (when organics processing facility is available) to the landfill ban and conducting more aggressive enforcement of the current ban. To more aggressively enforce the landfill ban, personnel at the fee gate at each transfer station and at the landfill would need to check each load and redirect self-haulers to the appropriate drop-off locations. The



Section 5

County would also need to work closely with the cities and the franchised haulers to ensure that the source-separation programs are being implemented effectively. The County would need to conduct periodic checking of loads from the franchised haulers to determine program effectiveness and recommend corrective action. The County already conducts a load-checking program for hazardous wastes; however, this program could be enhanced to provide greater enforcement of banned materials. It is possible that the County could conduct these additional load-checking activities with the staff and contractor resources currently in place at landfill and transfer stations.

- **Countywide construction and demolition debris diversion ordinances.** The County has regulated construction and demolition debris (C&D) by restricted disposal of wood waste, cardboard, and scrap metal at the landfill. However, C&D remains a component of Sonoma County's waste stream and some C&D may bypass the disposal System and be disposed in landfills outside of Sonoma County. The City of Santa Rosa passed a C&D ordinance requiring all C&D haulers to obtain a non-exclusive franchise from the City that requires 50 percent diversion of all C&D collected in the City. The cities of San Jose and Stockton require all C&D generators to demonstrate 50 percent recycling, as a condition of the building permit. The County and the cities may wish to consider establishing even higher recycling requirements for C&D haulers or generators such as 100% concrete and aggregate recycling. The San Jose C&D program includes a deposit system where building permit applicants place a deposit based on the square footage of the project. Once the applicant has demonstrated that it has recycled C&D either through one of the C&D diversion facilities certified by the City, or by providing receipts documenting diversion, the deposit is returned to the applicant. San Jose employs two staff to implement the C&D program, who are responsible for certifying C&D facilities, reviewing reports prepared by C&D generators, and managing the deposit system. A portion of the program costs are paid by the "float" from the deposits held by the City. For purposes of evaluating this component, we will assume that the additional resources needed for C&D program management would amount to one full-time equivalent staff person or \$100,000 per year.
- **Product stewardship.** Product stewardship places the responsibility or cost of disposal or recycling of particular materials on the manufacturers of products. An example of this is the State's original bottle bill (AB 2020) processors fee. Another example is new Senate Bill, SB 20 which will place a \$6 to \$10 charge to the consumers on all CRT containing devices such as computer monitors. This bill became effective January 1, 2005. Most product stewardship programs require implementation on the State level. However, some programs lend themselves to implementation on the County level. One program the County could implement is to require building construction contractors to build "green buildings" or require some recycled content use. This would put the responsibility on the building manufacturers to use recyclable building materials. The County has already focused on product

stewardship for household hazardous wastes and electronics. The Waste Management Agency has been involved in local organizing and lobbying efforts to influence regulatory product stewardship efforts at the state and federal level. The County could take the further step of adopting a precautionary principle approach, including full-cost accounting, to reduce the impacts on human health and the environment in all Sonoma County decision-making. Other than staff time within available staffing resources, no additional costs are anticipated.

- **Zero waste funding.** The CIWMB defines Zero Waste as follows:
“Zero waste involves utilizing the most effective industry processing or manufacturing practices to efficiently conserve the use of raw materials, including front-end design for efficiency, while educating consumers. It includes promoting technology to encourage source reduction on the front end and recycling and other technologies on the back end, and harnessing the energy potential in “waste” by using new and clean technology to convert the material directly into green fuel or gas to produce electricity.”

Should the County develop a zero waste goal, the County may need to establish a specific funding source, such as a landfill tipping fee surcharge or collection rate surcharge to fund these projects. The voters in Alameda County passed Measure D in 1990 which included a \$6 per ton tipping fee (adjusted annually for inflation) to fund programs to reach 75 percent diversion and beyond. Fifty percent of the funds are distributed to the cities in the County to fund local programs, and countywide programs are administered by the Alameda County Source Reduction and Recycling Board. The annual budget for the Board and its sister agency, the Alameda County Waste Management Authority, was \$19 million for fiscal year 2004-2005. The joint agency does not own or operate facilities and does not manage collection contracts. The resources of the agency are dedicated to waste prevention and recycling programs.

- **Changing public behavior.** The Waste Management Agency has implemented efforts in community based social marketing to increase participation in recycling and composting programs. To build upon this effort, the County and the cities may wish to implement a more aggressive outreach and technical assistance program. An example is the Berkeley “Cash for Trash” program advertising a five cent bag refund. To significantly increase program participation countywide with a goal of diverting an additional 5 percent per year, the County would need to spend at least about \$150,000 per year.
- **Commercial, institutional, and industrial outreach and technical assistance.** The CoIWMP anticipates the development of a new comprehensive business-centered program for the commercial/industrial sector. The City of Rohnert Park currently provides recycling technical assistance to commercial businesses and multi-family dwellings through a \$30,000 annual contract. Countywide commercial technical assistance program costs range from \$200,000 per year in San Francisco



Section 5

to \$570,000 per year in Alameda County (for hard costs not including staff costs). For purposes of evaluating this component, we will assume that the additional resources needed for staff and contractor assistance to implement this program in the County total about \$100,000 per year.

- **Market development.** Developing local and regional markets for recyclable materials, particularly those materials that are prevalent in the County's waste stream but have limited markets, such as plastics, food waste, and reusable materials, could provide significant new diversion opportunities. The County may wish to assist local markets by more actively participating in the Sonoma/Mendocino/Lake Counties Recycling Market Development Zone. The most successful Recycling Market Development Zones (RMDZ) in the state are those that have staff dedicated to recycling market development. Support for retaining, expanding, and attracting businesses to the County could be provided through siting assistance, businesses plan review, and direct financial assistance. The County may wish to consider establishing a grant program or revolving loan fund for local recycling and reuse businesses. Development of an eco-park or resource recovery park for recycling and reuse businesses located in Santa Rosa or adjacent to one of the transfer stations, could provide additional diversion outside of Recycle Town. Dedicated RMDZ staff and market development support to recycling and reuse businesses could amount to about \$200,000 per year.
 - **Salvaging for reuse at the landfill and transfer stations.** Nationally recognized Recycle Town at the Central Landfill is one of the pre-eminent drop-off programs for reusable materials located at a disposal site. A number of landfills and transfer stations, including the Berkeley Transfer Station and Sanitary Fill in San Francisco also employ staff or contractors to salvage reusable materials from loads that are being disposed at the tipping area. At Sanitary Fill, Norcal employees fill trailers with reusable items to be shipped to St. Vincent de Paul in Eugene, Oregon. Berkeley contracts with Urban Ore, a company that generates over \$1.5 million in gross revenues per year, to salvage reusable material from the tipping area at the transfer station. The County may wish to consider licensing a scavenger to salvage reusable material from the landfill or transfer station tipping areas. The County could also station 40 cubic yard bins at the transfer stations for transporting reusable items from the transfer stations to Recycle Town.
 - **Bulky item collection.** Many communities offer bulky item collection programs specifically designed for reuse and recycling. The Central Contra Costa Solid Waste Authority contracts with Pacific Rim Recycling to collect items for resale and reuse through the East Bay Depot for Creative Reuse. San Francisco's Bulky Item Collection Program is an on-call collection program that targets the following items for recycling: scrap metal, green waste, appliances, mattresses, and electronics. Costs for scheduled or on-call service range from \$1-2 per household per month to \$15 per pickup.
-

- **Source-separated organics.** Several Bay Area communities have implemented source-separated organics programs, targeting food waste, food-contaminated paper, waxed cardboard and other compostables. In some jurisdictions, such as Berkeley, Oakland, and San Francisco, special front-end loader commercial routes have been established for commercial food waste generators, including restaurants, and produce marts. In other jurisdictions, such as Alameda, Fremont, and San Francisco, organic materials are co-collected with green waste and incorporated into the green waste collection program. The County intends to maintain separate collection for green waste composting locally. However, the County could consider implementing a dedicated route for source-separated organics generated by commercial businesses. Based on information from the Sonoma County Waste Management Agency's director, there could be sufficient generators countywide to dedicate at least one collection route to source-separated organics. The material could be hauled to a compost facility outside of the County, such as Jepson Prairie Organics in Solano County. Assuming 500 pickups per day, five days per week at 7 tons per day. The County could divert approximately 1,820 tons per year at a cost of \$230,000 or \$127 per ton (assuming \$80 per hour for transport and \$35 per ton tipping fee). Although the County is not planning on implementing a wet-dry collection system in the short-term, since this type of collection is becoming an industry trend, the County should keep track of the technology and revisit it over the long-term.
- **Tool lending library.** A decade ago some community librarians in California initiated a great idea that paralleled the lending of books. The idea was to lend tools. The idea slowly spread to a couple of dozen other U.S. towns, but the most active and well-stocked tool libraries were established in the San Francisco Bay Area; including Berkeley, Oakland, and San Francisco. The typical tool lending library offers basic hand tools, and a selection of garden, landscaping, and construction tools. Many of these "occasional" tools are what might be found at a tool rental shop. The idea is to create a reuse and repair facility that promotes and facilitates local repair and reuse programs and classes including those already held in Sonoma County such as at Home Depot, Santa Rosa Junior College, and clubs like the Electric Auto Association and Community Bikes. The cost for the program is estimated to be about \$150,000 annually including staffing and purchase and maintenance of the tools.
- **Materials exchange program.** Freecycling is an innovative concept that harnesses the power of the Internet to establish a materials exchange between a materials donor and a materials recipient. Unlike traditional charitable organizations that accept people's castoffs and sell them for low prices in thrift-type shops (or end up taking them to the dump anyway), freecycling allows for personal contact between donor and recipient. The cost for the program is estimated at about \$25,000 for program implementation.



Section 5

- **Wet-dry collection.** An emerging strategy for diverting more materials, particularly for the commercial sector, has been the development of wet-dry collection systems. The dry fraction includes source-separated recyclables, including cardboard, glass and plastic, and other residuals (which are screened out at the recycling facility) and the wet fraction includes organics, particularly food waste, food-soiled paper, other compostable paper, and other residuals (which are screened out at the compost facility). In San Jose, 500 commercial businesses participate in wet-dry collection. This approach would require that Sonoma County change its current approach to collection and processing. The Countywide Integrated Waste Management Plan (CoIWMP) anticipates on-going collection of three streams of material (recyclables, green waste, and solid waste) with future plans to address the solid waste stream through pre-processing at a MRF and anaerobic digestion or other treatment of the residual materials. As described in Alternatives 9 and 10, this approach can be costly and is currently unproven at the scale required in Sonoma County. An alternative collection and processing system could include the approach that was being proposed for the City of Petaluma, including wet-dry collection. Wet-dry collection requires processing of the dry fraction at a MRF designed to handle source-separated recyclables along with dry residue. The wet-fraction, which would include all compostables, could be processed at a compost facility designed to accept all compostable materials (including green waste, food waste, and contaminated paper) like Jepson Prairie Organics in Solano County or Z-Best Compost Facility in Santa Clara County. The Z-Best Compost Facility includes significant pre-processing capabilities such that some operators (including Green Waste and Green Team) direct loads of “gray cart” wet waste (from multi-family and commercial businesses) and co-collected loads of “green cart” and “gray cart” materials (from single-family) including the residual fraction to Z-Best. The dry fraction in San Jose, Portola Valley, and Woodside does not include residuals. The overall residual fraction at Jepson Prairie Organics is 6 percent and the residual fraction at Z-Best is 15 percent. Wet-dry collection is an industry trend currently being proposed by major collection companies specifically to reduce the cost of collection and disposal. In the cities of Portola Valley and Woodside, wet-dry collection resulted in a 20 percent reduction in collection rates. According to the Sonoma County Waste Management Agency’s director, wet-dry collection has previously been investigated and because of 1) the cost to implement and change collection operations countywide and 2) the lower product quality derived from the recovered materials and the potential lack of stable long-term markets, it was not analyzed further in this study.

Other policies and programs suggested by the Sonoma County Local Task Force - Zero Waste Subcommittee, include:

- **Reduction and Recycling of Organic Waste** – includes ban of materials such as food waste and organics, and promoting programs for the reuse and recycling of organics.
- **Refilling Station Contest** – competitive design for a retail refilling station filling a variety of containers with consumer supplies.
- **Zero Waste Events** – require large venues and community special events to implement zero waste plans as an event permit condition.

Appendix A contains details on each of these Zero Waste Subcommittee programs described above.

Evaluation

A. Operating History – Score 5

Most of the policies or strategies for maximizing diversion identified above have an established precedent or regional example familiar to the County. Faced with dwindling landfill capacity and public pressure to conserve resources, many communities have established goals beyond 50 percent diversion and are implementing aggressive new recycling and waste prevention programs.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 4

All of the policies and strategies for maximizing diversion are consistent with AB 939 and the integrated waste management hierarchy. Policies based on source reduction or waste prevention are at the top of the hierarchy. Diversion potential for each approach varies from conceptual to significant.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 5

Many of these policies are focused on local economic development, local program implementation and increases in jobs and social benefits. For example, Urban Ore in Berkeley operates a landfill salvage program and generates \$1.5 million in gross revenues and employs 25 people.

D. Environmental Consequences – Score 5

Accelerating plans and programs to reach diversion rates in excess of 70 percent will have a positive effect on the local environment by reducing disposal. Alternatives that include transportation out-of-County or increased collection within the County, such as taking source-separated organics to Solano County or implementing new bulky item collection programs, may result in some air quality and traffic impacts. Development of new facilities such as resource recovery parks or eco-parks could have land-use planning impacts.



Section 5

E. Role of Public Sector Entities and JPA Participation Potential – Score 5

Many of the policies and programs would require regional cooperation between the County and the cities. Most of the initiatives could be undertaken by the Waste Management Agency on behalf of the County and the Cities.

F. Regulatory Cooperation – Score 3

Most of the policies do not require cooperation from regulatory bodies.

G. Disposal Needs and Obligations – Score 4

This alternative has the potential to reduce the disposal needs of the County and the Cities.

H. Capital Costs – Score 3

Capital costs for this alternative are minimal; they include:

- Dedicating the principal funding for the revolving loan fund
- Development of a resource conservation park or eco-park
- Funding purchase of tools for a Tool Lending Library
- Funding for Refilling Station Contest

I. Operating Costs – Score 2

Annual operating costs for this alternative include:

- Mandatory source-separation - \$100,000 for outreach and enforcement in the first 2-3 years for program set-up
- C&D program - \$100,000 for implementation in the first 2-3 years for program set-up
- Changing public behavior - \$150,000 for staff and contractor resources
- Commercial outreach and technical assistance - \$100,000 for staff and contractor resources
- Market development - \$200,000 for dedicated staff and business assistance
- Bulky item collection - \$1-2 per household per month
- Source-separated organics - \$230,000 for dedicated collection route
- Tool Lending Library - \$150,000 for program operation
- Materials exchange program - \$25,000 for program implementation

J. Cost per Ton – Score 2

A number of the policies and initiatives include no new costs or costs for staff support only. Program costs for source-separated organics collection are estimated to be \$127 per ton.

Program costs for bulky item collection are estimated to be \$150 per ton, based on \$15 per pickup of 100 pounds of reusable or recyclable materials. Costs can be recovered by expanding the current AB939 fees to include these programs and policies. It is understood that diversion decreases the amount of waste for disposal. If disposal System economics continue their dependence on disposal tipping fees, and the amount of tonnage for disposal is decreased through diversion, the amount of “fixed” disposal System costs will need to be supported by fewer and fewer tons, thus increasing the cost per ton or tipping fee of the disposal System. Section 8 discusses alternatives to economically support these measures through funding outside of disposal System tipping fees.

K. Siting, Design, Permitting, and Construction Requirements – Score 3

Not applicable for most recycling and reuse components. Siting of a resource conservation park adjacent to a County transfer station or in an industrially zoned area of Santa Rosa could have moderate permitting and construction issues. These issues could be mitigated somewhat by co-locating the park with existing hauler operations.

L. Effect on Current System Costs – Score 2

The policies and programs for maximizing recycling could be funded through user fees (such as for bulky item pickup and source-separated organics collection) or a new tipping fee or collection rate surcharge, as described above. As discussed above, funding these policies and programs through the disposal System tipping fee will effectively increase the cost per ton through the requirement to cover “fixed” disposal System costs with less disposal tonnage available (diverted from disposal by these programs). Other funding approaches, as discussed in Section 8, need to be implemented.

Alternative 4 – Expansion of Central Disposal Site

Analysis

An integrated waste management system must include a disposal element. Even the most aggressive diversion systems have residual wastes, which require disposal. Typically, a centrally located disposal facility within a defined geographical or political region provides its communities the highest level of control while also providing the lowest cost as compared to disposal at out of region disposal facilities. A locally owned and operated disposal facility eliminates costly transfer and transport expenses. Also, a publicly owned disposal facility provides its member agencies control over decisions affecting service levels and environmental compliance to protect the public, when compared to privately owned disposal facilities.

Presuming the local disposal facility operates within a similar regulatory requirement and operational capacity as disposal facilities in neighboring regions, the local disposal facility



Section 5

should have generally similar costs to other disposal facilities. The fundamental cost components of a disposal site could be summarized to include:

- Land purchase,
- Site infrastructure (access roads, entrance scales, environmental control facilities, etc.),
- Containment systems (Liner and closure improvements),
- Operations, and
- Management.

The Central Disposal Site is owned by the County. The site has been developed with the necessary site infrastructure to function accordingly. The most recent costs of operations at the site were estimated to be about \$41 per ton, which appears to be on the high end of the range of other landfills surveyed as shown in Appendix B. The primary challenge of this site is the potential cost of the containment systems. At the Central Disposal site groundwater can be shallow or surface in springs, therefore, the prescriptive standard of 5 ft. separation distance between groundwater and the bottom of the containment system is not achievable and an engineered alternative must be designed. The cost of installing an engineered alternative containment system, which will satisfy the RWQCB may be significantly higher than disposal facilities in other regions of California. Further complicating this issue is the fact that, at this time the RWQCB has not approved a containment system for any further expansion. So cost estimates contained herein are based on the liner system currently being discussed with RWQCB staff. Additionally, given the County's recent experience with the East Canyon Phases 1 and 2, each future phase of construction will likely require a separate approval by the RWQCB and therefore, the requirements could be subject to future changes. It should be noted that the County has always operated the Central Landfill consistent with the current regulations in force at the time of operations and many of the issues now causing problems for the County are consistent with other sites constructed prior to Subtitle D requirements.

The expansion of the Sonoma County Central Disposal Site entails development of one or more of three distinct areas on the site, the East Canyon, the Rock Extraction Area, and the North Area Expansion (Compost Operations Area). With all planned expansions the Central Disposal Site could provide about 14 years of capacity, depending on the rate of refuse inflow. These are summarized as follows:

- **East Canyon Area:** The total estimated waste capacity of the East Canyon is approximately 6.9 million cubic yards. This includes approximately 2.2 million cubic yards of permitted capacity in Phases I and II (County staff estimates that Phases I and II portion of the East Canyon will be exhausted of its capacity by approximately August 2005 at current fill rates) and 4.7 million cubic yards of unpermitted capacity in Phases III, IV, and V. The East Canyon Area is currently fully permitted by the CIWMB. However, the permitting and construction of Phases III and IV, and the subsequent
-

Phase V, are suspended at this time pending the results of various studies and remedial actions required by the RWQCB, related to constituents of concern detected in water collected from the under drain below Phases I and II and areas of potential impact to ground water adjacent to the perimeter of the original Central Landfill.

- **Rock Extraction Area:** The total estimated waste capacity of the Rock Extraction Area is approximately 3.3 million cubic yards. The County has had consultants prepare a conceptual design study. Full documentation for permit applications for regulatory submittals have been prepared but not submitted. At this time, there are no permits in place for this expansion. The RWQCB has indicated that use of this area will depend on the outcome of the leachate and landfill gas extraction effort in the original landfill.
- **North Expansion Area:** The North Expansion Area would be a vertical expansion in the area currently being used as the Compost Operations area. County staff reports that the area can hold approximately two million cubic yards of capacity. We understand from County staff that the RWQCB requires a substantial liner for this expansion to separate the two waste management units. According to County staff, no design or permitting documents are in progress at this time. Therefore, the North Expansion Area is not permitted at this time to receive wastes.

When combining the potential expansions of the East Canyon, Rock Extraction Area, and North Expansion Area at the Central Disposal Site, a total of up to approximately 10.0 million cubic yards of landfill capacity may be realized. Using the updated estimated flow rate, the proposed Central Disposal Site expansions represent approximately 14 years of capacity. However, according to County staff, the proposed expansions are contingent on various remedial measures for the existing Central Landfill and East Canyon required by the RWQCB. Accordingly, due to the lack of permits, the Central Disposal Site currently had permitted waste capacity only through August 2005.

As a result, the primary risk of the expansion of the Central Disposal Site is obtaining regulatory agency approval for the containment improvements. More specifically, the challenge is procuring regulatory approval that can be relied upon for the duration of the waste placement activities through all phases of expansion. The North Coast RWQCB appears understandably reluctant to approve of waste placement adjacent to the older fill modules due to various leachate and gas issues. While RWQCB staff is working cooperatively with the County to analyze the efforts being made by the County to demonstrate adequate control of leachate and landfill gas, it is uncertain at what point the RWQCB will be assured enough on these issues to allow waste placement in these areas. The possibility of initially securing a permit at the commencement of a containment system improvement and at a later time having the regulatory agency retract the permit causing the County to shut-down operations in the middle of a phase appears to exist. This permit predicament renders this alternative potentially unreliable.

The RWQCB issues Waste Discharge Requirements (WDR) that govern the placement of wastes at the site within the California Code of Regulations. The WDR describes that the



Section 5

County discovered a release of waste constituents from the landfill to the shallow groundwater aquifer beneath the site. Further, the WDR describes the County's attempt to implement corrective actions to this release by implementing an Evaluation Monitoring and Corrective Action Program (EMCAP). The RWQCB issued a prohibition on the placement of wastes at the site beyond the currently permitted waste management units (East Canyon Phase I/II) as follows:

"Disposal of waste outside of the permitted footprint for Landfill I, Phases I and II of Landfill 2 as described in Report of Waste Discharge/Joint Technical Document is prohibited"

The RWQCB cites the rationale for this action is the corrective action as follows:

"Monitoring information obtained following construction and commencement of operations of Phase I and II have indicated that this EAD (Engineering Alternative Design) may not be adequately protective of water quality. Efficacy of the EAD liner design is currently under review. These WDR's do not permit any landfill construction for further expansion"

The RWQCB has not provided specific performance goals that the County must adhere to in order to resume with the expansion of the site. Consequently, it is not possible at this time to estimate with assurance the cost or extent of improvement needed to comply with the RWQCB. Further, it is not possible to estimate the amount of time necessary to secure regulatory approval. However as an attempt to develop a more robust containment system design, the County has developed conceptual designs, which, although not approved, are believed to be acceptable to the RWQCB. The costs of these improvements are described in more detail under the economic issues below.

Evaluation

A. Operating History – Score 5

The Central Disposal site has been operating since 1971. The Central Disposal Site has performed as the primary landfill for the region and has adequately accommodated the waste stream through these years of operation, accepting increasing quantities as smaller landfills within Sonoma County closed in recent years. The Central Disposal site has been reliable in its ability to handle the current and historical waste stream. Landfilling is the standard disposal methodology for the solid waste industry in California. Although, with the growth of urban development combined with increased land values, some urban landfills have been closed, landfilling remains the lowest cost, most common method of managing wastes in modern times.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 2

Continued operation of the existing landfill and expansion of the Central Disposal site does not affect the diversion potential of Sonoma County. However, the County may employ

diversion plans that could affect the viability of this alternative. As discussed above, funding diversion policies and programs through the disposal System tipping fee will effectively increase the cost per ton through the requirement to cover “fixed” disposal System costs with less disposal tonnage available. Other funding approaches, as discussed in Section 8 need to be implemented. Landfill operations are consistent with the State’s AB 939 hierarchy inasmuch as landfills are the lowest option for sanitary management of municipal waste residues. This alternative does not directly contribute to educating the public about diverting waste, although funding of this education can be accomplished by appropriate financial management. This alternative does not have an impact on the long-term viability of working towards a zero waste goal. This alternative does not prohibit the highest and best use of materials in diversion processes.

C. Distribution of Economic Benefits, Social Equity,, and Impacts – Score 3

Re-opening of the existing landfill and expansion of the Central Disposal Site will effectively add jobs lost due to the closure. However, new jobs were created through the implementation of out-of-County haul. Accordingly, this alternative does not increase or decrease the potential for creating and maintaining employment or growth opportunities for residents, businesses, and industries within the County. This alternative does not affect social equity.

D. Environmental Consequences – Score 3

Presuming the protective design features in combination with the prescribed corrective actions protect groundwater in compliance with CCR 27 at the Central Disposal Site, the environmental consequence of this Alternative is benign. The County has implemented a groundwater protection program that entails the extraction of the impacted shallow groundwater. The shallow groundwater is directed to the sanitary treatment facility where it is treated to appropriate discharge levels before being discharged. In this, the County has already implemented appropriate mitigation measures to this impact. The primary positive environmental benefits from implementing this alternative include avoidance of air quality and traffic impacts related to hauling wastes out of Sonoma County. This alternative does not generate environmental justice issues.

E. Role of Public Sector Entities and JPA Participation Potential – Score 3

Continued operation and expansion of the Central Disposal Site continues the existing role of the public sector entities. Reduced participation of the various entities extends the remaining life of the site, albeit at a higher per ton cost.

F. Regulatory Cooperation – Score 1

Based on conversations with County staff, correspondence, and Waste Discharge Reports from the Regional Water Quality Control Board (RWQCB) it appears regulatory agency



Section 5

approvals at this site in the future are uncertain. The inability for Sonoma County to rely upon the acceptable permit status condition of the site affects Sonoma County's ability to reliably depend upon the landfill as a long-term disposal facility. As a result, the primary regulatory risk related to implementation of the alternative is the unreliability of the regulatory agency approval. In addition, the possibility of initially securing a permit at the commencement of a containment system improvement and at a later time having the regulatory agency retract the permit causing the County to shut-down operations in the middle of a phase appears to exist. The financial and legal impact of lack of regulatory approvals is the fact that the County is unable to be relied upon by the various jurisdictions directing their wastes to the facility. Aside from legal clarification of an acceptable corrective action program, it is unclear how regulatory cooperation can be accomplished.

G. Disposal Needs and Obligations – Score 4

Expansion of the Central Disposal Site can provide necessary disposal needs to Sonoma County and its contributing jurisdictions for about 14 years. This alternative does not reduce the need for disposal. This alternative will assist Sonoma County in meeting its disposal capacity needs. The expansion of the Central Disposal site is within Sonoma County. Lack of regulatory cooperation is the primary risk regarding capacity associated with the alternative.

H. Capital Costs – Score 2

County staff reported the Phases I and II area had a cost of approximately \$15.3 million and contained 2.2 million cubic yards. Using a refuse density of 1,200 pounds per cubic yard inclusive of daily cover, this area had a cost of approximately \$11.60 per ton.

Estimates provided by the County in early 2004 indicate the capital cost of the East Canyon Phase IV to be approximately \$4.04 million (which is the lowest bid from a competitive procurement process). This cost represents liner construction for approximately 14 acres. The corresponding cost per acre for this liner is approximately \$290,000 per acre, which is generally within the typical range of costs for this industry within California. In response to regulatory concerns about the containment design, the County revised the estimated cost of the Phase IV liner to be approximately \$16.6 million. This cost represents an increased footprint of the liner improvement for an area of approximately 19.3 acres. The corresponding cost per acre for this liner system, which would presumably be acceptable to the regulatory agencies, is approximately \$800,000 per acre. This area is reported to allow the placement of approximately 1.5 million cubic yards of capacity. Using the refuse density of 1,200 pounds per cubic yard, the resulting cost of this area is about \$18.47 per ton.

Using the estimated cost of the robust Phase IV liner as the basis for projecting the future robust liner cost in Phases III and V, the approximate cost of Phase III is \$7.2 million and Phase V is \$11.5 million. The cumulative capital cost of the East Canyon (inclusive of Phases III, IV, and V) is approximately \$35.3 million. The cumulative capacity for this area (inclusive of Phases III, IV, and V plus "tie in" fill area) is approximately 4.7 million cubic

yards. The overall cost for this area is approximately \$12.50 per ton for the containment systems. This figure assumes a robust containment system.

The County has had extensive discussions with the RWQCB regarding the need for a more robust containment system design for the future containment system improvements in the Rock Extraction Area (REA). The County estimates the REA Phases I, II, and III will cost about \$26 million. These phases represent 30 acres. The unit cost per acre for these containment systems are very high compared to the industry standards. The REA is estimated to contain a total capacity of approximately 3.3 million cubic yards. Using the same refuse density as above, the robust REA containment system is estimated to cost approximately \$13.09 per ton.

The compost area received wastes prior to 1997 and was unlined. The compost area is approximately 33 acres in size. The County estimates the cost of installing a containment system in this area to cost \$9.2 million. This area is estimated to contain approximately 2 million cubic yards of capacity. Using the same refuse density, this equates to a cost of between \$7.40 per ton. This cost per ton is less than shown for the other phases discussed above, as the compost area would be developed over existing waste and less liner would be required.

The total capital cost of the combined East Canyon improvements and the REA total approximately \$70.4 million. Assuming the total capacity of these improvements provide approximately 10 million cubic yards of capacity, the resulting life of these expenditures is approximately 14 years. The average cost per ton for these improvements is estimated to be \$11.60.

I. Operating Costs – Score 3

The operating cost of this alternative includes the following cost components:

- Operating the existing scale house,
- Operations of the waste receipt and placement activities including amortization of the equipment, staffing, etc.,
- Environmental control system operations, and
- Administrative management.

The historical cost is approximately \$41 per ton.

J. Cost per Ton – Score 2

The historic operating cost of the Central Disposal Site has been approximately \$41 per ton. This amount represents a fully burdened cost without capital improvements. The County reports the cost of the more robust containment system to be approximately \$11.60 per ton as described above. Accordingly the new cost per ton would be approximately \$53. As discussed above, this reflects the capital cost of the robust liner design specified by the



Section 5

RWQCB, the projected closure cost, and the continued landfill operations cost. This estimated cost is higher than the current out-haul cost of approximately \$41 per ton.

K. Siting, Design, Permitting, and Construction Requirements – Score 2

The steps associated with the process of securing permits for the expansion of the Central Disposal Site include the following:

- Preparation of a technical document (a Joint Technical Document including a Report of Waste Discharge and a Report of Disposal Site Information) describing the methods intended to be employed to protect groundwater quality, air quality, prevent human and animal contact, protect the environment from the presence of the waste.
- Processing of an evaluation of the project in accordance with CEQA.
- Coordination and cooperation with the regulatory agencies to secure their approval of the proposed methods as intended by the development of appropriate facilities.

This process typically requires six months to a year from the time of submittal to securing regulatory approval, depending upon the level of complexity, availability of regulatory staff for the review of the submittal, and type of CEQA process employed.

The RWQCB has shown interest in unique design and construction requirements for the Central Disposal Site expansion. These include the installation of a double composite liner. These requirements exceed the prescribed Title 27 design requirements. The RWQCB indicates that this robust design is necessary due to the presence of shallow groundwater and the geologic regime at this site.

L. Effect on Current System Costs – Score 2

Assuming facility design and improvements comply with the regulatory agency directives, the cost per ton will need to be approximately \$53 per ton. This represents an approximate \$12 per ton increase in the current cost of operations as compared to out-haul.

Alternative 5 – Subregional Waste System

Analysis

This alternative reflects a potential downsizing of the Sonoma County Waste Management Agency (Agency). This would occur if a majority of the jurisdictions decided to handle their own waste and not utilize the County Solid Waste Management System. It was assumed that the County and possibly a couple of the smaller jurisdictions would maintain some form of the current Agency and establish a subregional waste system. This subregional system would be responsible for operations and maintenance of a solid waste infrastructure to handle its own waste. For purposes of analysis, it was further assumed that the size of this subregional entity would be about 50% of the current disposal System or generate about

186,000 tons per year (TPY) for disposal, with the remainder of the cities leaving the regional system and managing their own waste disposal.

Under this scenario, mandatory collection of waste (as discussed in Appendix D) and flow control agreements with participating jurisdictions would be required. Depending on the remaining participating jurisdictions, some or most of the transfer stations would either be closed or operated with reduced hours. Depending on the outcome of issues related to expansion of Central, the landfill may need to be closed and waste exported outside of Sonoma County. Under the 50% waste stream reduction the Central Landfill could still be operated; however, tip fees would need to be increased to cover the costs of operations. Estimated costs to operate the landfill are about \$53 per ton. This cost of operation alone may need to be increased to as much as \$75 to \$80 per ton to cover those portions of the operating cost that are “fixed” and not tonnage driven. If the cost to export waste out-of-County is less than the amount of this fee, exportation for the subregional system should be considered.

For the subregional system to be successful, the overall cost (as much as possible, see above), liability, regulatory requirements, and system management would need to be reduced. As discussed in Alternative 2, certain costs of past liabilities, such as closed portions of Central and other closed landfills will need to be funded by those past users of the site(s). These costs will need to be separated from the new subregional costs. One of the initial steps in development of the subregional entity is to establish the cost for use of the new system from its commencement date forward. All costs from past use will need to be spread over the historic users of the sites, and be paid for.

Several counties throughout California have had jurisdictions leave or not participate in their JPA; these include Imperial, Humboldt, Central Contra Costa, and Los Angeles. We understand the reasons for leaving or non-participation varied from cost to control issues.

If jurisdictions opt to leave the County disposal System and the Agency is downsized, the County would be required to take the following steps to implement this subregional entity:

- Establish who the participating members in the new entity will be
- Analyze the infrastructure requirements based on the participating members (transfer stations in areas of participation, sizing disposal needs, etc.). At the appropriate level of downsizing several transfer stations may need to be closed or have hours reduced
- Separate the costs out for past liabilities and establish a cost for the new participants
- Pass a mandatory collection ordinance to ensure all waste and recyclables are being collected
- Implement flow control for the members in the subregional agency ensuring all collected materials are delivered to the new system
- Charge-out costs for past liabilities to historic disposal System users (whether or not they continue participation in the new disposal System)



Section 5

Evaluation

A. Operating History – Score 3

Although reducing a regional solid waste system is not commonplace there are several counties within California in which that has occurred. These JPAs have continued their successful operations.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 2

The diversion potential of this scenario would be potentially lower, due to reduction in waste flow and thus revenues to fund programs and facilities for waste diversion.

C. Distribution of Economic Benefits, Social Equity,, and Impacts – Score 2

The alternative would not create new jobs. In fact, some jobs may be lost or transferred due to the downsizing of the Agency and the reduced operational needs of the disposal System.

D. Environmental Consequences – Score 2

Potential negative impacts include increased vehicle traffic due to each jurisdiction's independent handling and transporting of their recyclables and waste. Environmental justice issues may or not be met as many more entities will be involved and the chance for meaningful involvement reduced.

E. Role of Public Sector Entities and JPA Participation Potential – Score 1

The alternative reduces the authority of the County or JPA in managing the disposal System.

F. Regulatory Cooperation – Score 2

Regulatory cooperation could be jeopardized by the splitting of the disposal System into many other minor subcomponents. This will be more difficult for the regulatory agencies to handle.

G. Disposal Needs and Obligations – Score 4

The alternative reduces the need for disposal of waste.

H. Capital Costs – Score 3

There should be little to no impact on the capital cost involved with development of the subregional System.

I. Operating Costs – Score 2

The operating cost on a per ton basis will be increased as fewer tons will be available to cover certain fixed costs of operation.

J. Cost per Ton – Score 2

The cost per ton would increase as discussed above; however, certain decreases will be realized due to transfer of past disposal System costs to the historic users of the disposal System.

K. Siting, Design, Permitting, and Construction Requirements – Score 3

This alternative would require certain ordinances, agreements, analyses, etc.; however, could be implemented in 3 or less years.

L. Effect on Current System Costs – Score 2

There will be an increase on current disposal System costs as fewer tons will be available to cover certain fixed costs of operation.

Long-Term Alternatives

Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul

Analysis

See Short-Term Alternative 1 for a general discussion and analysis of the export of solid waste for disposal out-of-County. As discussed with regard to Short-Term Alternative 1, the County has stopped accepting waste at the CDS for landfill disposal effective September 2005. Understanding that there were no other operating landfills in Sonoma County, besides the landfill at the CDS, exporting of solid waste outside of Sonoma County was required. Accordingly, the County has entered into short-term contracts for out-haul for up to 5 years. The following analysis focuses on the use of long-term export (after the 5 year term) for an indefinite period beyond 2010.

We understand the ColWMP has a goal to maintain local disposal capacity to handle its own waste; however, based on the Waste Discharge Requirements issued by the North Coast Regional Water Quality Control Board (RWQCB), it may take longer to develop than anticipated or future disposal may not be allowed under any circumstance. The pursuance of the long-term export option provides a safety net should this occur. Note that long-term reliance on export rather than development of new long-term publicly owned local capacity minimizes the risk associated with capital investment in terms of guesstimating how much capacity will actually be needed, and when - as long as export contracts do not contain "put



Section 5

or pay" or unreasonable minimum tonnage requirements. Obviously, any minimum tonnage commitment must reflect the commitment by some or all of the jurisdictions, or possibly just of the County unincorporated area to direct waste to the County disposal System. The risk that a host landfill may for whatever reason, be unable to take Sonoma County waste increases over time. While guarantee of capacity can be dealt with contractually, the cost of that capacity may go up due to increased distance to another site and/or a higher transport and disposal fee.

Long-term export of waste may require additional capital expenditures to expand the Tipping Facility at the CDS to handle the larger amounts of transferred waste over the long term. Operating costs will be similar to those discussed in the Analysis section of Alternative 1 Short-Term, but will reflect CPI or other adjustments necessary over the longer time period.

The approach considered for transport of waste out-of-County for the short-term, focused on utilization of highway transfer trucks. Although this is the methodology used by most jurisdictions transferring waste, the option of transporting waste-by-rail (WBR) should be considered for long-term plans. It is difficult to predict the long-term capacity of near-by California landfills; however, trends show a decrease in capacity in these landfills as expansions and development of new landfills are not being granted. As capacity in these near-by landfills diminishes, prices for disposal usually increase. The use of an out-of-state landfill that has enormous amounts of capacity at a very reasonable price should be considered. Transporting waste to out-of-state landfills is cost prohibitive for highway transfer trucks. Rail is usually the preferred option for this type of transportation.

The Northern California Rail Association (NCRA), which directs operations of the local rail line in Sonoma County, suggests siting the local rail yard outside the town of Windsor. We have assumed that the most feasible and cost effective option for the County would be to limit the development and operations to a basic rail yard at this site for transferring containers, not developing a new MRF/Transfer Station.

The County would need to add intermodal flat-bed transfer vehicles and top-pick hoists to load the containers onto the flat bed transfer vehicles at the transfer stations. We have assumed that there will only be three transfer facilities needing these improvements: Central Tipping Building, Sonoma Transfer Station, and Healdsburg Transfer Station. Due to the volume of waste generated, Annapolis Transfer Station should direct its materials to Healdsburg and the Guerneville Transfer Station should direct its waste to Central for compaction into intermodal containers. In the case of out-of-County rail haul, the Central Disposal Site would need to be closed and waste transferred through the current tipping facility at Central. The County could issue an RFP to procure an operator that would develop the remaining infrastructure and operational needs including:

- Local Rail Yard to load intermodal containers onto rail cars on the spur track

- Rail Haul for transporting containers over the rail lines to the remote rail yard

Remote Rail Yard to off-load the containers to the landfill or transfer vehicles for haul to the landfill

The contract could also include out-of-state disposal. We estimate that the cost would be approximately \$44 - 53 per ton for all requirements of rail haul and disposal. The NCRA believes that the development of WBR can serve as a basis to revive the use of rail in the County. NCRA indicates that the public and businesses could take advantage of an operating rail service. Additional details regarding the analysis of rail for Sonoma County are included in a letter report in Appendix E.

As discussed above with regard to Alternative 1 Short-Term and Alternative 2, when waste leaves Sonoma County, the County incurs and will continue to incur costs related to past disposal as well as other disposal System costs. This issue must be resolved during the Short-Term period, with mechanisms put in place to ensure that all disposal System costs are funded. Thus, unfunded disposal System costs should not be a factor in decisions regarding long-term disposal needs.

Evaluation

A. Operating History – Score 5

Landfill disposal has a long and proven track record and is the industry standard. Landfill disposal is the best of several options for final disposal of solid waste, and is cited in the AB 939 hierarchy as preferable to transformation. Within the longer timeframe, one or more conversion or diversion technologies as discussed in Alternatives 9 and 10 may provide an alternative to or a reduction in landfill disposal.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 3

This alternative does not impact diversion objectives, plans or activities as long as there is no contractual “put or pay” or unreasonable minimum tonnage commitments. If this alternative is implemented long-term, the County should review options with its potential export contractors to identify potential diversion options.

C. Distribution of Economic Benefits, Social Equity,, and Impacts – Score 2

This alternative continues the initial loss of local jobs, income, and investment that occurs with Alternative 1 Short-Term. As with the Short-Term Alternative, these impacts can be somewhat mitigated to the extent that a preference is given for transporters that are headquartered in Sonoma County and/or that hire locally. If export is the primary long-term disposal option, additional decisions will need to be made about long-term reductions in, or reassignments of County staff.



Section 5

D. Environmental Consequences – Score 2

The environmental consequences of long-term export of solid waste, including issues of environmental justice are generally the same as discussed above for this criterion with relation to Alternative 1 Short-Term. The possible mitigations discussed above for Alternative 1 Short-Term are also generally applicable to the long-term. Several exceptions include:

- Air quality impacts of transport will decrease to the extent that fuel mileage and emissions improve over time with new technologies, including compliance with the new California state regulations for alternative fuel use. Green house gas decreases will be primarily a function of improved efficiency and mileage per unit of fuel.
- The long-term risk of contamination of soil and or groundwater at the disposal site increases with ongoing disposal, except to the extent that disposal practices and technology continue to improve over time.

Any long-term disposal contract should provide the County assurance that the site(s) maintain or surpass initial levels of safety, and that operations reflect any ongoing improvements in disposal technology.

From BVA's research and analyses some WBR impacts include:

- Reduced congestion on roads – assuming disposal of 372,200 tons, approximately 16,200 large truck round trips to the landfill could be eliminated annually; however, local traffic could be increased waiting for trains within Sonoma County
- Reduced accidents – according to the National Center for Statistics & Analysis, approximately one out of nine accidents involved large trucks
- Reduced noise, except for those residents located close to the rail lines
- Reduced road maintenance costs
- Reduced air emissions - rail produces less than one-tenth of the carbon monoxide; around one-twentieth of the nitrogen oxide; less than 9% of the fine particulates and around 10% of the volatile organic compounds compared to highway vehicles
- Reduced energy consumption - approximately 1/10 that of highway transport
- Reduce global warming - Every ton of freight carried by rail produces at least 80% less carbon dioxide than by road. At present nearly 40% of carbon dioxide emissions from road transport come from large trucks and buses.

E. Role of Public Sector Entities and JPA Participation Potential – Score 4

Unless the long-term County export agreement applies only to the unincorporated waste stream or a subregional waste system as described in Alternative 5, long-term export will require some form of commitment of the incorporated area waste stream whether bilaterally

between the County and individual jurisdictions, or more broadly through modification of the current JPA agreement. With the longer timeframe there is sufficient time to address these issues. In short, long-term export provides both the need and opportunity for greater cooperation. See Alternative 2 for detailed discussion and analysis of organizational options for the County, the other jurisdictions, and the JPA.

F. Regulatory Cooperation – Score 3

This alternative does not particularly affect, and is not affected by regulatory issues and relationships.

G. Disposal Needs and Obligations – Score 3

The alternative does not add to disposal need, and thus is neutral in impact with regard to this criterion.

H. Capital Costs – Score 2

There may be some capital costs required to expand the existing Tipping Facility at the CDS to handle the increased tonnage over the long-term. Amortization of the capital cost could add \$1 to \$2 per ton to the tipping fee. If the WBR option is pursued, approximately \$22 to \$29 million in additional capital funds for rail yard improvements may be needed.

I. Operating Costs – Score 2

Operating costs for highway transport and disposal should be in the range of the current \$41 per ton out-haul cost (escalated by contractual terms) as described above for Alternative 1 Short-Term and thus are less expensive than current Central Landfill operating costs. Operating costs for WBR are estimated to be about \$39 to \$46 per ton.

J. Cost per Ton – Score 2

Combined cost per ton for highway transport and disposal should be in the range of \$42 to \$43 per ton in 2005 dollars, including capital expenses for expansion of the Tipping Facility, excluding any host fees. Costs for WBR are estimated to be in the range of \$44 to \$53 per ton in 2005 \$'s.

K. Siting, Design, Permitting, and Construction Requirements – Score 2

There are a couple of implementation issues that may affect the timing associated with the County's need to contract for long-term disposal capacity. These include the need to amend the ColWMP and complete the California Environmental Quality Act (CEQA) process to support long-term out-haul. In addition, a contract regarding long-term waste stream commitments will need to be completed. Implementation of WBR will impact the need for additional siting, design, permitting, and construction requirements, effecting potential



Section 5

project timing. If needed, the expansion of the Tipping Building at Central can be accomplished in a relatively short manner.

Host county concerns, and possible host fees are the same for the long-term option as discussed above for this criterion under Alternative 1 Short-Term. Any potential perceived economic benefit to a host county associated with a long-term contractual County commitment may be balanced by the corresponding long-term impacts of import.

L. Effect on Current System Costs – Score 2

As noted in discussion of this criterion for Alternative 1 Short-Term, the long-term alternative will have some impact on decreasing disposal System costs, with the estimated contractual cost for exportation lower than Central Landfill operating costs. However, to the extent that the County disposal System manages and exports tonnages from only a portion of the County, mechanisms must be put in place in the short-term to ensure that any unfunded disposal System costs are funded. Taking into account these disposal System costs, overall costs may not be affected.

Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs

Analysis

Local government cannot afford to research, develop, finance, and deploy recycling programs for every new product introduced into the market (e.g. mercury-laden athletic shoes with lights in their soles, unrelenting streams of electronic devices designed for disposal, etc.). As the composition of the waste stream is increasingly comprised of complex products instead of raw materials, recycling programs have become expensive and onerous for local government (Cathode Ray Tube management and recycling as a case in point). Therefore eliminating waste or even attaining the County's 70% waste reduction goal cannot be achieved through recycling alone. The best strategy to eliminate waste is to design it out of the industrial system. This approach is usually referred to as "Zero Waste."

Zero waste does not mean 100% recycling. Zero waste differs from recycling in that it aims to eliminate waste, not manage it. A primary Zero Waste strategy is to look "upstream" in order to re-design our products, materials, and systems of resource-use to keep them from entering the waste stream. Successful programs model natural cyclical processes where no waste exists. This does not mean that we no longer produce products, but rather that all products generated, deliberately or otherwise, must be redesigned to become a useful input into another process. It also seeks to prevent these products from becoming the responsibility of local government.

Communities around the world have adopted Zero Waste goals and principles. Communities in California include Del Norte County, San Francisco, San Luis Obispo County, and Santa

Cruz County and Burbank. Additionally, the California Integrated Waste Management Board (CIWMB) has also established a zero waste goal as a component of its strategic plan.

While the scale of Zero Waste is too large for Sonoma County to attain on its own, it can affect its progress. Sonoma County has experienced success in this regard when working in concert with other local agencies. Program costs can be kept low by cooperating with other local governments.

The following Zero Waste policies and programs were developed at a “planning level” with input from the Local Task Force (LTF). Appendix B includes details developed by the LTF for a number of Zero Waste programs.

Long-term Programs and Policies

- **Product bans.** Bans of specific products (such as Styrofoam packaging in Berkeley) or fees on products (such as take-out containers in Pittsburg or plastic bags as proposed in San Francisco) may not result in significant diversion. However, they can focus on specific problem materials that cannot be effectively recycled or reused. There may be some costs associated with product bans or fees on products for education/enforcement, depending on how the policy is structured.
- **Zero waste research and development.** Maximizing diversion is an interim step on the path to Zero Waste. True reduction in generation is the goal of Zero Waste (so that discarded materials do not have to be handled through either diversion or disposal programs). To reduce the generation of waste, Sonoma County will need to develop a Zero Waste plan and may need assistance in identifying Zero Waste initiatives and policies. For example, the Lawrence Berkeley Laboratory and the Rocky Mountain Institute have been leaders in the development of specific practices and technologies for increasing energy efficiency. The Sonoma County could partner with Sonoma State University or other institutions to research specific strategies or approaches for achieving Zero Waste. Research and development projects may be eligible for grant funding through private foundations or Sonoma County may dedicate specific funds to research and development. The annual budget for the Center for the Development of Recycling at San Jose State University is \$56,000. An annual expenditure of this amount, dedicated to Zero Waste research and development, could result in the identification of significant new approaches and alternatives.

Other policies and programs suggested by the Sonoma County Local Task Force - Zero Waste Subcommittee, include:

- Expand the existing Product Stewardship program to target more products. Lobbying position should advocate for programs that recapture the highest function, not the material components (e.g. design for reuse, upgrading, and re-manufacturing).



Section 5

- Support adoption of product fees that reduce waste.
- Reverse existing policies that create barriers for businesses to reuse products and materials.
- Provide technical assistance to assist businesses in implementing zero waste practices.
- Support introduction of grants, loans, regulatory incentives, economic incentives for businesses to implement zero waste practices.
- Support introduction of loans, grants, and/or economic incentives to spur business and non-governmental organizations (NGO) zero waste programs.
- Remove any existing subsidies for refuse.
- Expand the County's influence and effectiveness by working in partnership with similarly minded public agencies in neighboring counties. Work in concert to implement programs, economic incentives, local policies, affect product stewardship, and participate in Zero Waste Research and Development.
- Fund the Sonoma/Mendocino Recycling Market Development Zone to expand its mission and use it as a vehicle for regional cooperation.

Evaluation

A. Operating History – Score 5

Most of the zero waste policies or strategies for maximizing diversion identified above have an established precedent or regional example familiar to Sonoma County. Faced with dwindling landfill capacity and public pressure to conserve resources, many communities have established goals beyond 50 percent diversion and are implementing aggressive new recycling and waste prevention programs.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 5

All of the zero waste policies and strategies for maximizing diversion are consistent with AB 939 and the integrated waste management hierarchy. Zero waste policies based on source reduction or waste prevention are at the top of the hierarchy. Diversion potential for each approach varies from conceptual to significant.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 5

Many of these policies are focused on local economic development, local program implementation, and increases in jobs and social benefits. For example, Urban Ore in Berkeley operates a landfill salvage program and generates \$1.5 million in gross revenues and employs 25 people.

D. Environmental Consequences – Score 5

Accelerating plans and programs to reach diversion rates in excess of 70 percent will have a positive effect on the local environment by reducing disposal. Alternatives that include transportation out-of-County or increased collection within the County, such as taking source-separated organics to Solano County or implementing new bulky item collection programs, may result in some air quality and traffic impacts. Development of new facilities such as resource recovery parks or eco-parks could have land-use planning impacts.

E. Role of Public Sector Entities and JPA Participation Potential – Score 5

Many of the zero waste policies and programs would require regional cooperation between the County and the cities. Most of the initiatives could be undertaken by the Waste Management Agency on behalf of the County and the Cities.

F. Regulatory Cooperation – Score 3

Most of the zero waste policies do not require cooperation from regulatory bodies.

G. Disposal Needs and Obligations – Score 5

This alternative has the potential to reduce the disposal needs of the County and the Cities.

H. Capital Costs – Score 3

Capital costs for this alternative are minimal; they could include zero waste program set-up and other programs that did not get implemented in the short-term.

I. Operating Costs – Score 2

Annual operating costs for this alternative could include the following:

- Zero waste program coordinator - \$100,000 for staff person
- Zero waste research and development - \$56,000 annual grant to university

Other operating costs for overall diversion were discussed above in Short-Term Alternative 3.

J. Cost per Ton – Score 2

Most of these policies and initiatives include no new costs or costs for staff support only. As discussed above, funding diversion policies and programs through the disposal System tipping fee will effectively increase the cost per ton through the requirement to cover “fixed” disposal System costs with less disposal tonnage available. Other funding approaches, as discussed in Section 8, need to be implemented.



Section 5

K. Siting, Design, Permitting, and Construction Requirements – Score 3

Not applicable for most zero waste components. Siting of a resource conservation park adjacent to a County transfer station or in an industrially zoned area of Santa Rosa could have moderate permitting and construction issues. These issues could be mitigated somewhat by working with a third-party developer.

L. Effect on Current System Costs – Score 2

The zero waste policies and programs could be funded through user fees or a new tipping fee or collection rate surcharge, as described above.

Alternative 6 – Development of West Expansion Area

Analysis

Similar to Alternative 4, expansion of the Central Disposal Site, the West Expansion provides similar benefits to the County and its member jurisdictions. The site is centrally located thereby avoiding the cost of transport to a distant landfill. Also, many of the fundamental costs of a disposal site are complete. For example, the site infrastructure would generally remain the same with the addition of on-site circulation roads accessing the new disposal areas. The West Expansion area is mostly owned by the County but will require the purchase of some additional land.

The West Expansion Area of the Central Disposal Site is estimated to cover approximately 144 acres of land outside the current waste placement limits. This area is planned for excavation per the conceptual design prepared by Vector Engineering in January 2004.

The resulting excavation volume is estimated to be approximately 19 million cubic yards of soil and rock (80 to 90 percent rock) within the expansion area. The rock extraction process is estimated to require six to eight years to complete. This process is estimated to provide a slight financial benefit to the county. The County estimates the revenues from the rock extraction contract will be approximately \$5 million.

The total estimated waste capacity of the West Expansion Area is approximately 24.3 million cubic yards. The West Expansion is still in the concept development phase and has not been permitted by the appropriate regulatory agencies. In addition, CEQA has not been initiated on this project at this time.

The risk of developing the West Expansion Area is similar to the expansion of the Central Disposal Site but complicated with the addition of a massive rock quarry extraction element and the need to acquire property and initiate residential relocation. As a consequence, this alternative has more regulatory approval risk than the Central Disposal site alternative. Although not in writing, the RWQCB has reportedly informed County staff that they may reserve judgment about the viability of West Expansion for a landfill until the rock mass has been removed and the suitability of the geologic and ground water conditions are confirmed.

If the RWQCB assumes this posture, their approval of the project could conceivably be many years after the project commencement. This would require the County to have expended significant quantities of money without the promise of securing a permit, yielding the project unviable. This predicament of securing only tentative regulatory approval renders this alternative potentially unreliable. It should be noted that one of the RWQCB issues is that a portion of the ultimate West Expansion would overlap onto the original Landfill and over the REA. The RWQCB may not be receptive to this, depending on the situation with leachate and gas control at the time. A reduction of the volume of the West Expansion was assumed as an option to avoid the overlap.

A. Operating History – Score 4

The Central Disposal site has been operating since 1971. The existing landfill at the Central Disposal Site has performed as the primary landfill for the region and has adequately accommodated the waste stream through these years of operation, accepting increasing quantities as smaller landfills within the city closed in recent years. It is presumed the West Expansion Area will perform much like the Central Disposal site inasmuch as providing a reliable method of handling the future waste stream. Landfilling is the standard for disposal in California. Although with the growth of urban development combined with increased land values, some urban landfills have been closed, landfilling remains the lowest cost, most common method of managing wastes in modern times.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 2

Development of the West Expansion Area at the Central Disposal Site does not affect the diversion potential of Sonoma County. However, the County may employ diversion plans that could affect the viability of this alternative. As discussed above, funding diversion policies and programs through the disposal System tipping fee will effectively increase the cost per ton through the requirement to cover “fixed” disposal System costs with less disposal tonnage available. Other funding approaches, as discussed in Section 8 need to be implemented. Landfill operations are consistent with AB 939. Landfill operations are consistent with the State’s AB 939 hierarchy inasmuch as landfills are the lowest option for sanitary management of municipal waste residues. This alternative does not directly contribute to educating the public about diverting waste although funding of this education can be accomplished by appropriate financial management. This alternative does not have an impact on the long-term viability of working towards a zero waste goal. This alternative does not prohibit the highest and best use of materials in diversion processes.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 3

Expansion of the West Area at the Central Disposal site does have minor affects with regard to social impacts. The West Expansion requires the acquisition of portions of the land used for the existing dairy located south west of the existing perimeter boundary. Expansion impacts are presumed to require the relocation of the dairy away from the area. The project



Section 5

will have the added benefit of producing aggregate for use in off-site construction from excavation of the West Expansion area. No other Economic or Social Equity impacts are anticipated as a result of this alternative. This alternative does not increase or decrease the potential for creating and maintaining employment or growth opportunities for residents, businesses, and industries within Sonoma County.

D. Environmental Consequences – Score 2

Presuming that the protective design features, in combination with the prescribed corrective actions protect groundwater in compliance with CCR 27 at the Central Disposal site, the environmental consequence of this Alternative is benign. The relocation of an adjacent dairy and incorporation of this property into the disposal site has been determined to have relatively minor environmental effects. A preliminary wetlands analysis concluded the potential for some minor habitat issues, which could be incorporated in the mitigations for the expansion design.

The County has implemented a groundwater protection program that entails the extraction of the impacted shallow groundwater. The shallow groundwater is directed to the sanitary treatment facility where it is treated to appropriate discharge levels before being discharged. In this, the county has already implemented appropriate mitigation measures to this impact. The primary positive environmental benefits from implementing this alternative include air quality, traffic impacts related to hauling wastes out of the county. This alternative does not generate environmental justice issues.

E. Role of Public Sector Entities and JPA Participation Potential – Score 3

The West Expansion Area at the Central Disposal site continues the existing role of the public sector entities. Also, similar to the Central Disposal Site Alternative above, if entities within the County region elect to direct their wastes elsewhere, this alternative remains viable. Reduced participation of the various entities extends the remaining life of the site, albeit at somewhat higher per ton cost.

F. Regulatory Cooperation – Score 1

Based on correspondence and Waste Discharge Reports from the Regional Water Quality Control Board (RWQCB) for the Central Disposal Site, we believe the ability to secure all needed permits is unknown. The inability for the County to rely upon the acceptable permit status condition of the site affects the County's ability to reliably depend upon the landfill as a long-term disposal facility. As a result, the primary regulatory risk related to implementation of the alternative is the unreliability of the regulatory agency approval. The financial and legal impact of unknown regulatory cooperation is that the in-County disposal system may be viewed as unreliable by the various jurisdictions directing their wastes to the facility. This lack of reliability may cause these jurisdictions to seek long-term disposal contracts elsewhere rendering the West Expansion Area without waste and economically

non-viable. Aside from legal clarification of an acceptable corrective action program, it is unclear how regulatory cooperation can be accomplished.

G. Disposal Needs and Obligations – Score 5

West Expansion of the Central Disposal Site provides on-going disposal needs to the County and its contributing jurisdictions. Sonoma County currently disposes of approximately 600,000 cubic yards of material annually. This alternative can accommodate approximately thirty-two years of disposal capacity for Sonoma County. This alternative does not reduce the need for disposal. This alternative will assist the County in meeting its disposal capacity needs. The West Expansion Area is within Sonoma County. Lack of regulatory approval and the unreliability of the waste flow quantity are the primary risks regarding capacity associated with the alternative.

H. Capital Costs – Score 2

The West Expansion area consist of two capital projects; a rock quarry project followed by a containment system improvement. The rock quarry project is estimated to entail the removal of approximately 19 million cubic yards of material. This project is estimated to require approximately six to ten years to complete. The County anticipates procuring a private company who will perform the quarry activities and pay the County a royalty based on the quantity of materials sold from the site.

Estimates provided by the County indicate the capital cost of installing the containment system improvements is approximately \$125.6 million for a robust system comparable to that highlighted for the Rock Extraction Area. The West Expansion area would provide 24.3 million cubic yards of solid waste capacity. Using this capital cost, the West Expansion area is projected to cost about \$8.60 per ton for the containment system.

I. Operating Costs – Score 3

The operating cost of the existing landfill is presumed to continue equivalent to the existing operations cost. The historical operations cost is approximately \$41 per ton.

The operating cost of this alternative includes the following cost components:

- Operating the existing scale house,
- Operations of the public receiving and transfer facility,
- Operations of the waste receipt and placement activities including amortization of the equipment, staffing, etc.
- Environmental control system operations, and
- Administrative management.

The new operating cost of the West Expansion would not need to change from the current \$41 per ton except for inflationary figures.



Section 5

J. Cost per Ton – Score 3

Projected cost per ton of the facility operation is estimated to be fairly consistent with the most recent costs, escalated for inflation.

K. Siting, Design, Permitting, and Construction Requirements – Score 2

The steps associated with the process of securing permits for the expansion of the West Expansion Area include the following:

- Preparation of a technical document (a Joint Technical Document including a Report of Waste Discharge and a Report of Disposal Site Information) describing the methods intended to be employed to protect groundwater quality, air quality, prevent human and animal contact, protect the environment from the presence of the waste.
- Processing of an evaluation of the project in accordance with CEQA.
- Coordination and cooperation with the regulatory agencies to secure their approval of the proposed methods as intended by the development of appropriate facilities.

This process typically requires more environmental review and regulatory oversight than a horizontal expansion. We estimate approximately two to three years is needed from the time of submittal to securing regulatory approval, depending upon the level of complexity, availability of regulatory staff for the review of the submittal, and type of CEQA process employed.

Based on requirements the RWQCB imposed at the Central Disposal Site, it is presumed a similar unique design and construction requirements will be required for the West Expansion Area. Although these requirements exceed the prescribed Title 27 design requirements, the RWQCB believes they are necessary to protect groundwater at this site. RWQCB maintains this robust design is necessary due to the presence of shallow groundwater and the geologic regime at this site.

L. Effect on Current System Costs – Score 3

Assuming facility design and improvements comply with the regulatory agency directives, the cost per ton should be approximately consistent with the most recent costs for operation, escalated for inflation.

Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County

Analysis

Presuming the new long-term landfill is located centrally and is operated within a similar regulatory requirement and operational capacity as disposal facilities in neighboring regions, the local disposal facility should have generally similar costs to other disposal facilities. The

new long-term landfill would need to include all of the fundamental cost components of a disposal site. These include:

- Land purchase,
- Site infrastructure (access roads, entrance scales, environmental control facilities, etc.),
- Containment systems (liner and closure improvements),
- Operations, and
- Management.

Of these cost components, the existing operations and management costs would presumably remain the same as the existing landfill. The remainder of the components would need to be developed at the new site.

Although a concept design for the development of a new long-term landfill within Sonoma County has not been fully developed, a preliminary Biological Study for Four Alternative Class III Landfill Sites was prepared in 1990. This study, prepared by Woodward Clyde Consultants, identified the environmental conditions of four previously studied sites.

Without conceptual designs, we have proceeded with the assumption that the development of a new landfill in Sonoma County will need to provide at least 50 or more years of capacity.

The risk of developing a new long-term landfill within Sonoma County is similar to the West Expansion Area, but potentially complicated with the additional impacts of an entirely new community including but not limited to traffic, property devaluation, odors, noise, water quality, etc. Also, the potential of environmental issues such as habitat or protected species impact may affect the selection and viability of a potential site. As a consequence, this alternative has more regulatory approval risk than the West Expansion Area alternative.

A. Operating History – Score 1

Development of a new landfill within the State of California is very difficult. Almost no sites have been developed in California in over 10 years. Keller Canyon Landfill is the most recent landfill opened in Northern California. It was opened in 1992.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 2

Development of a new landfill within Sonoma County does not affect the diversion potential of the County. However, the County may employ diversion plans that could affect the viability of this alternative. As discussed above, funding diversion policies and programs through the disposal System tipping fee will effectively increase the cost per ton through the requirement to cover “fixed” disposal System costs with less disposal tonnage available. Other funding approaches, as discussed in Section 8 need to be implemented. Landfill operations are consistent with AB 939. Landfill operations are consistent with the State’s AB



Section 5

939 hierarchy inasmuch as landfills are the lowest option for sanitary management of municipal waste residues. This alternative does not directly contribute to educating the public about diverting waste although funding of this education can be accomplished by appropriate financial management. This alternative does not have an impact on the long-term viability of working towards a zero waste goal. This alternative does not prohibit the highest and best use of materials in diversion processes.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 2

Development of a new landfill in the County may have significant impacts on social equity, depending upon the location and specific conditions of the potential site. This alternative does not increase or decrease the potential for creating and maintaining employment or growth opportunities for residents, businesses, and industries within the County.

D. Environmental Consequences – Score 1

Presuming the protective design features, the environmental consequence of this Alternative with respect to groundwater is anticipated to be benign. However, environmental consequences as a result of other impacts are unknown. Other environmental impacts include but are not limited to traffic, air quality, disturbances to biological habitat or species, economic degradation of property, etc.

E. Role of Public Sector Entities and JPA Participation Potential – Score 3

The development of a new local landfill would continue the existing role of the public sector entities.

F. Regulatory Cooperation – Score 1

Based on correspondence and Waste Discharge Reports from the North Coast Regional Water Quality Control Board for the Central Disposal Site, we believe the ability to secure all needed permits is unknown. The siting of a new landfill could occur within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board. The ability to secure permits from this regional entity is also unknown.

G. Disposal Needs and Obligations – Score 5

Development of a new landfill in Sonoma County would provide on-going disposal needs to Sonoma County and its contributing jurisdictions. Sonoma County currently disposes of approximately 600,000 cubic yards of material annually. This alternative will assist Sonoma County in meeting its disposal capacity needs. The new landfill site would be identified within Sonoma County.

H. Capital Costs – Score 1

The capital cost for a new landfill is unknown at this time. For evaluation purposes, we developed an estimate of capital costs inclusive of the following:

- Land acquisition
- Environmental Impact Report preparation
- Mitigation measures
- Development of new access roads
- On-site infrastructure (administration, entrance scales, gate houses, etc.)

Our estimate of these development costs is approximately \$28 million based on historic development costs for other California landfills. We have estimated the cost for the required containment system to be consistent with the robust design discussed for the Rock Extraction Area and the Western Expansion Area above. Approximately \$211 million will be needed for approximately 48.6 million cubic yards of capacity. This calculates to approximately \$5.79 per ton for the new landfill. Actual costs could be different depending on site conditions.

I. Operating Costs – Score 3

The operating cost of the existing landfill is presumed to continue equivalent to the existing operations cost. The operations cost is approximately \$41 per ton as reported by the County. The operating cost of this alternative includes the following cost components:

- Operating the existing scale house,
- Operations of the waste receipt and placement activities including amortization of the equipment, staffing, etc.
- Environmental control system operations, and
- Administrative management.

J. Cost Per Ton – Score 2

The development of a new landfill would require installation of significant infrastructure, access roads, environmental control features, etc. The new landfill cost is estimated to be approximately \$47 per ton.

K. Siting, Design, Permitting,, and Construction Requirements – Score 1

The steps associated with the process of siting and securing permits for a new landfill within the county include the following:



Section 5

- Conducting a site selection analysis of the County taking into account federal, state, and local regulatory limitations, community growth goals, access and traffic considerations, environmental concerns, local and regional economics, etc.
- Preparing an unbiased rating process whereby the preferred site(s) may be evaluated in further detail,
- Preparation of a technical document (a Joint Technical Document including a Report of Waste Discharge and a Report of Disposal Site Information) describing the methods intended to be employed to protect groundwater quality, air quality, prevent human and animal contact, protect the environment from the presence of the waste.
- Processing of an evaluation of the project in accordance with CEQA.
- Coordination and cooperation with the regulatory agencies to secure their approval of the proposed methods as intended by the development of appropriate facilities.
- Secure property ownership voluntarily or through condemnation.

This process typically requires more environmental review and regulatory oversight than a horizontal expansion. We estimate approximately five to eight years is needed from the time of submittal to securing regulatory approval, depending upon the level of complexity, availability of regulatory staff for the review of the submittal, type of CEQA process employed, and public opposition.

L. Effect on Current System Costs – Score 2

Assuming facility design and improvements comply with the regulatory agency directives, the cost per ton will need to be approximately \$47 per ton. This is fairly consistent with the current cost of operations.

Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County’s Waste

Analysis

The existing County System could be expanded into a multi-county regional system, including one or more nearby counties, to handle, process, divert, and or dispose of waste materials. This would increase the amount of waste handled by the region and could potentially allow opportunities for cost savings through economies of scale. The County identified and has approached staff at four near-by or adjacent counties to assess interest in participating in some form of regional system. The Counties of Del Norte, Humboldt, Mendocino, and Napa are in relatively close proximity to Sonoma County and are each exporters of solid waste. All of these Counties lie along the highway 101 corridor for easy transportation access, except for Napa County, which is adjacent to the east.

Currently there are two possible opportunities for future cooperation with one or more of these counties:

- Share in use of a Regional Landfill, were a new landfill to be sited and developed within the five county area, and/or
- Participate in an export agreement to transport solid waste to a landfill(s) located outside of the five county areas, should larger volume result in a lower price.

Note that processing of the waste materials to divert from landfilling may be a component of either of these scenarios. Potential cooperative roles for materials recovery and composting, could be a subset of Alternative 9 or 10.

BVA staff interviewed senior staff overseeing solid waste management for the four neighboring counties regarding the above scenarios as well as information on organizational and institutional issues. As part of the interviews, BVA staff also collected solid waste system financial information that will be used in later analysis. This included analysis of the economic feasibility of the above two scenarios. It was determined that staff of three of the four counties (Humboldt, Mendocino, and Napa) exercise varying degrees of flow control, are not locked into long-term disposal agreements, and would be interested in possible joint disposal arrangements and/or other areas of cooperation. Humboldt and Mendocino Counties have conducted unsuccessful landfill siting processes in their counties and are not interested in a repeat effort. Napa County has no plans to develop local capacity. Del Norte County has a long-term disposal commitment and thus is not a viable partner.

The opportunities identified above can be further separated into four options for regional cooperation regarding disposal, two each for import to Sonoma County and two each for export:

- Option 1 - Import additional waste into the current County System,
- Option 2 - Import waste into Sonoma County for disposal at a new landfill,
- Option 3 - Export Sonoma County waste to an existing or new landfill located in one of the nearby counties, or
- Option 4 - Export waste jointly with one or more nearby counties to a host landfill in another location.

With regard to Option 1, Mendocino County staff expressed potential interest in exporting waste to the Sonoma County System, depending of course on capacity, pricing, and assuming the lifting of the current import ban.

Option 2 can be thought of as a subset of Alternative 7 (development of a new local landfill). The impacts are essentially the same as those evaluated for Alternative 7, except with some potential additional economic benefit such as a host fee balanced by additional environmental consequences due to greater landfill capacity, increased truck traffic, etc.



Section 5

Again, Mendocino County presumably may have some interest in participating in this Option.

Options 3 and 4 are in effect subsets of Long-Term Alternative 1 Export, with the impacts similar to those identified for that alternative. As noted above, with regard to Option 3 there is little enthusiasm in any of the other counties for developing a landfill to import waste. In addition, Sonoma County has a strong history of solving problems internally rather than exporting them. Del Norte, Humboldt, and Mendocino Counties are exporting all of their waste, and Napa County exports a significant portion of its waste. Napa's Clover Flats is the only real option, and it is not a great one due to limited availability of capacity, traffic access through Napa County, and a current relatively high tip fee. In summary, Option 3 is unlikely to occur.

Option 4 has the most potential of the four options identified above, if for no other reason, ease of implementation. It just requires new or modified contracts rather than development of new landfill capacity. Several key questions would need to be addressed, including:

- Would the waste streams from two or more counties be physically combined, or just contractually combined? The latter seems more likely than the former, although as Napa County noted, there may be the opportunity to accept additional transfer vehicles at the Devlin Road Transfer Station. This facility has rail haul access and there is a rail line that could potentially deliver waste from Humboldt and/or Mendocino Counties. However, the rail spur line into the site would require capital investment prior to use. Humboldt County already has a transfer station and there is little value in transferring waste twice.
- Should Sonoma County negotiate a new contract and potentially invite other counties to join them, or work with another county to amend their disposal contract to add Sonoma County's waste stream? The County would presumably wish to pursue the former approach; however, there may be some advantage to the latter approach. In either case, it is an opportune time to discuss the issue with Humboldt County staff since they are in the process of buying out their current transfer and disposal contract, in part to gain more flexibility regarding disposal.

However, there are two factors that could ultimately reduce the value of Option 4 to Sonoma County:

- With relationship to potential partner counties, Sonoma County's waste stream is by far the largest. Mendocino County probably has the most potential as a partner; some of Mendocino County waste is now transferred through the County's Annapolis Transfer Station and private collectors use MRF's in Santa Rosa to process recyclables from Mendocino County. Mendocino County's disposal stream is only about 200 TPD, or about 15 to 20 percent of Sonoma County's. Thus any monetary value associated with combining waste streams is likely to accrue much more to generators in Mendocino County than in Sonoma County. (Conversely, Mendocino County staff in particular expressed concern about the market effect of the sudden
-

appearance of Sonoma County's waste stream and the impact it may have on pricing for counties with smaller waste streams.)

- The current state of disposal in much of northern and central California, at least for private site operators with whom we spoke is that capacity is available, but facility owners feel no need to sign large tonnage, discounted contracts in order to maximize short-term gains. In comparison to the past ten years, the focus is increasingly shifting to maintaining capacity for all users and especially for municipalities with whom the various companies hold collection franchises. It may be that Sonoma County would see little monetary advantage to combining waste streams, but that (as noted in discussion of Alternative 1, short-term and long-term) the County may need to enter into contracts with several landfills in order to meet capacity needs.

Further information regarding potential partnering with counties near to Sonoma County is included in Appendix B.

Evaluation

The evaluation is based on Option 4 for joint disposal contracting, as described above.

A. Operating History – Score 3

There are examples of contractual inter-county or cross-county cooperation for disposal, including, for instance, the Napa-Vallejo Waste Management Authority (portions of Napa and Solano Counties). While it is not an option that is in widespread use, there are no inherent reasons it cannot be done.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 3

This alternative does not impact diversion objectives, plans, or activities as long as there is no contractual "put or pay" or minimum tonnage commitment.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 2

This alternative results in reduced local jobs, income, and investment. These impacts can be somewhat mitigated to the extent that the County contracts with transporters that are headquartered in Sonoma County and/or that hire locally.

D. Environmental Consequences – Score 2

Environmental consequences are essentially identical to those for Alternative 1, Long-Term, including air quality, traffic impacts, disposal impacts and issues of environmental justice related to the transport route and/or disposal site location.



Section 5

E. Role of Public Sector Entities and JPA Participation Potential – Score 4

As with Alternative 1, Long-Term, unless the long-term County export agreement will apply only to the unincorporated waste stream, long-term export requires some form of commitment of the incorporated area waste stream whether bilaterally between the County and individual jurisdictions or more broadly through modification of the current JPA agreement. With the longer timeframe there is sufficient time to address these issues. Long-term export provides both the need and opportunity for greater cooperation.

F. Regulatory Cooperation – Score 4

This alternative provides the opportunity for, and requires cooperation with one or more nearby counties.

G. Disposal Needs and Obligations – Score 3

This alternative addresses existing disposal needs through a multi-county system of disposal options.

H. Capital Costs – Score 3

There may be some minimal capital costs required to expand the existing Tipping Facility at Central to handle the increased tonnage over the long term.

I. Operating Costs – Score 4

The County presumably will not pursue this alternative unless it is of monetary benefit with relationship to exporting alone (as analyzed for Alternative 1 Export Long-Term).

J. Cost per Ton – Score 4

The County presumably will not pursue this alternative unless it is of monetary benefit with relationship to exporting alone (as analyzed for Alternative 1 Export Long-Term).

K. Siting, Design, Permitting, and Construction Requirements – Score 4

Implementation needs and timing are both reasonable. More effort is required than for Alternative 1 Export, Long-Term due to the need to cooperate with other public entities and to negotiate a more complex contract.

L. Effect on Current System Costs – Score 4

The County presumably will not pursue this alternative unless it is of monetary benefit with relationship to exporting alone (as analyzed for Alternative 1 Export Long-Term) – with the result that disposal System costs should remain the same or possibly decrease.

Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Handle Source Separated and Non-Source Separated Recyclables

Analysis

Materials Recovery Facilities (MRFs) have been developed and utilized for many years throughout California, the U.S., and the world to successfully recover recyclable materials from waste. There are many types of MRFs to handle the various waste streams generated by residents and commercial businesses. MRFs can be designed to accept and process a variety of materials including source separated materials such as recyclables from curbside collection, or recyclables from commercial businesses. MRFs can also be designed to handle non-source separated materials such as mixed refuse. MRFs can contain highly mechanized processes or very simple manual labor sorting processes.

Currently, only North Bay Corporation (North Bay) and Empire Waste Management (Empire) operate Materials Recovery Facilities (MRFs) within Sonoma County. North Bay is attempting to develop a new MRF in Santa Rosa to handle curbside collected single-stream mixed recyclables, construction and demolition wastes and some other mixed loads of refuse. Each of these MRFs is utilized by their respective hauler to process source separated recyclables collected from their curbside routes. These routes represent the bulk of source separated recyclables generated by residents within Sonoma County. Empire indicates that they have 50% of their overall processing capacity available, while North Bay indicates that they have reached capacity at their current facility (this is a reason they are attempting development of another facility). Understanding these factors indicates that the County does not need to develop any new MRF capacity to handle the source separated materials collected curbside. The private sector indicates that they can handle processing of these materials.

Although sufficient MRF capacity exists to process Sonoma County's source separated materials, a MRF should be considered to handle non-source separated mixed materials generated by Sonoma County's residents and businesses. The MRF facility could accept and process those materials targeted for landfill disposal to recover recyclable and reusable materials and reduce the amount of materials destined to be landfilled. Table 5-1 shows the composition of those mixed waste materials based on the 1999 CIWMB's Statewide Study, including 2004 and 2025 estimates of tonnage based on ColWMP and updated 2003 figures. Based on our knowledge of industry practice, we have also included potential recovery estimates for those materials such as paper, glass, metal, plastic, organics, and construction and demolition (C&D) materials. The MRF diversion rate for this type of facility is estimated to be about 17% based on the amount and composition of incoming Sonoma County waste. Overall additional Countywide diversion, based on a total of 1,105,841 tons estimated to be disposed and diverted in 2004, (averaged from ColWMP and updated figures) is approximately 7.7%.



Section 5

A facility of this type should be centrally located for easy access by all jurisdictions. Locating the MRF at or near the existing Central Disposal Site (CDS) might be beneficial for several reasons:

- Centrally located
- Transport infrastructure, including transfer stations exist
- Assist in reducing materials destined for landfill at Central or export
- Existing CDS Tipping Facility and Recycle Town could be expanded to incorporate MRF functions.

Expansion of the CDS Tipping Facility would need to be investigated for developing a MRF to handle a peak design of approximately 1,400 tons per day (TPD) in 2004 to about 1,700 TPD in 2025. A facility to handle this waste stream would need to be approximately 120,000 to 140,000 square feet in size. The facility would include a large tipping floor to receive and conduct some initial floor sorting of the waste. The waste material could then be loaded onto a system of processing lines to handle the large capacity. Large bulky items, such as wood and brush could be removed at the pre-processing stations. A series of screens could be used to size and separate materials to improve the efficiency of the manual sorting process. Manual sorters would be used to separate the paper, plastic, glass, and some non-ferrous metals. An overhead belt type magnet could be used to recover ferrous metals. Recovered materials such as glass and bulky metals could be stored in large debris boxes for transport to market. Other materials, such as paper, plastics, aluminum and ferrous containers, could be baled prior to shipment to market. The facility would incorporate other functions already active such as the Recycle Town reuse center, HHW facility, and recyclables drop-off facility.

The capital cost of this size and type of facility would be approximately \$15,000,000 to \$25,000,000. Operating costs would be approximately \$30 to \$45 per ton for this size and type of facility. A list of California MRF tip fees is shown in Table 5-2; these figures represent the overall cost including operations and repayment or amortization of capital costs. Typical overall tipping fees for this facility would be in the range of \$35 to \$55 per processed ton.

The MRF could be developed and owned by Sonoma County, the JPA, or a private entity. Likewise, the MRF could be operated by Sonoma County, the JPA, or a private entity. Ownership by Sonoma County or the JPA would have some advantages. These include:

- Control of waste,
- Control of diversion levels and new programs, and
- Rate stabilization.

Although the County or JPA could own the facility, public or private operations may be considered.

Alternatives Analysis

The MRF could be developed as a front-end to the proposed Organic Processing Facility discussed in Alternative 10 below. The Organics Processing Facility requires “clean-up” of the feed stock to remove as much non-organic material as possible prior to processing. The MRF would be able to remove these non-organic recyclables and waste prior to processing.



Section 5

Table 5-1 | Estimated MRF Recovery

Material Type	Totals Est. %	2004 Est. Tons	2025 Est. Tons	Estimated Recovery Rate Est. %	Assumed Recovered 2004 Est. Tons	Assumed Recovered 2025 Est. Tons
Paper	30.99%	152,264	186,101	n/a	37,341	45,640
Uncoated Corrugated Cardboard	5.19%	25,507	31,175	60%	15,304	18,705
Paper Bags	0.79%	3,863	4,722	40%	1,545	1,889
Newspaper	4.63%	22,748	27,804	40%	9,099	11,121
White Ledger	1.77%	8,720	10,657	40%	3,488	4,263
Color Ledger	0.16%	800	978	40%	320	391
Computer Paper	0.31%	1,526	1,865	40%	610	746
Other Office Paper	1.42%	6,958	8,505	40%	2,783	3,402
Magazines and Catalogs	1.81%	8,907	10,886	40%	3,563	4,355
Phone Books and Directory	0.32%	1,570	1,919	40%	628	768
Other Miscellaneous Paper	4.55%	22,336	27,299	0%	-	-
Remainder/Composite Paper	10.04%	49,328	60,290	0%	-	-
Glass	3.40%	16,694	20,404	n/a	3,787	4,629
Clear Glass Bottles and Containers	1.54%	7,560	9,240	30%	2,268	2,772
Green Glass Bottles and Containers	0.48%	2,342	2,862	30%	703	859
Brown Glass Bottles and Containers	0.55%	2,722	3,327	30%	817	998
Other Colored Glass Bottles and Containers	0.02%	85	104	0%	-	-
Flat Glass	0.16%	767	937	0%	-	-
Remainder/Composite Glass	0.65%	3,218	3,934	0%	-	-
Metal	5.58%	27,404	33,494	n/a	9,434	11,530
Tin/Steel Cans	1.06%	5,210	6,368	60%	3,126	3,821
Major Appliances	0.04%	220	269	80%	176	215
Other Ferrous	1.91%	9,393	11,480	50%	4,696	5,740
Aluminum Cans	0.25%	1,242	1,518	60%	745	911
Other Non-Ferrous	0.28%	1,380	1,686	50%	690	843
Remainder/Composite Metal	2.03%	9,962	12,175	0%	-	-
Plastic	9.26%	45,486	55,595	n/a	10,490	12,821
HDPE Containers	0.89%	4,360	5,329	60%	2,616	3,198
PETE Containers	0.48%	2,368	2,895	60%	1,421	1,737
Miscellaneous Plastic Containers	0.68%	3,330	4,071	0%	-	-
Film Plastic	4.38%	21,509	26,288	30%	6,453	7,887
Durable Plastic Items	1.47%	7,225	8,830	0%	-	-
Remainder/Composite Plastic	1.36%	6,693	8,180	0%	-	-
Other Organic	37.59%	184,701	225,747	n/a	11,142	13,618
Food	19.21%	94,380	115,353	0%	-	-
Leaves and Grass	7.42%	36,484	44,592	25%	9,121	11,148
Prunings and Trimmings	1.61%	7,897	9,651	25%	1,974	2,413
Branches and Stumps	0.04%	186	228	25%	47	57
Agricultural Crop Residues	0.00%	12	15	0%	-	-
Manures	0.28%	1,400	1,711	0%	-	-
Textiles	2.48%	12,204	14,917	0%	-	-
Remainder/Composite Organic	6.54%	32,138	39,280	0%	-	-
Construction and Demolition	8.63%	42,391	51,811	n/a	12,470	15,241
Concrete	0.46%	2,284	2,792	50%	1,142	1,396
Asphalt Paving	0.09%	438	536	0%	-	-
Asphalt Roofing	0.02%	77	94	0%	-	-
Lumber	3.84%	18,880	23,075	60%	11,328	13,845
Gypsum Board	1.08%	5,304	6,483	0%	-	-
Rock, Soil and Fines	1.54%	7,569	9,252	0%	-	-
Remainder/Composite Construction and Demolition	1.60%	7,839	9,581	0%	-	-
Household Hazardous Waste	0.26%	1,274	1,557	n/a	-	-
Paint	0.13%	651	796	0%	-	-
Vehicle and Equipment Fluids	0.01%	31	38	0%	-	-
Used Oil	0.00%	14	18	0%	-	-
Batteries	0.06%	313	382	0%	-	-
Remainder/Composite Household Hazardous	0.05%	264	323	0%	-	-
Special Waste	2.33%	11,432	13,972	n/a	-	-
Ash	0.04%	200	244	0%	-	-
Sewage Solids	0.00%	-	-	0%	-	-
Industrial Sludge	0.01%	46	57	0%	-	-
Treated Medical Waste	0.02%	74	91	0%	-	-
Bulky Items	1.24%	6,073	7,423	0%	-	-
Tires	0.29%	1,402	1,714	0%	-	-
Remainder/Composite Special Waste	0.74%	3,635	4,443	0%	-	-
Mixed Residue	1.98%	9,729	11,891	n/a	-	-
Mixed Residue	1.98%	9,729	11,891	0%	-	-
Totals	100%	491,375	600,573	n/a	84,664	103,478
Diversion					17%	17%

Table 5-2 | MRF – Year 2000 CIWMB Tipping Fee Survey

California MRF- Site Name	Rate \$/Ton
TEHACHAPI RECYCLING, INC	\$29.00
WASTE MANAGEMENT SOUTH GATE TRANSFER	\$33.00
MAMMOTH RECYCLING FACILITY AND TS	\$43.00
MRWMD MATERIALS RECOVERY FACILITY	\$30.00
NAPA GARBAGE SERVICE MRF	\$45.00
WESTERN PLACER WASTE MGMT AUTHORITY MRF	\$72.75
EASTERN REGIONAL MRF	\$59.00
WEST VALLEY MATERIALS RECVR'Y FACILITY	\$33.00
VICTOR VALLEY MRF & TRANSFER STATION	\$65.00
LOVELACE TRANSFER STATION	\$38.15
TULARE COUNTY RECYCLING COMPLEX	\$54.00
WESTERN EL DORADO RECOVERY SYSTEMS MRF	\$53.00
PARAMOUNT RESOURCE RECYCLING FACILITY	\$34.00
RAINBOW RECYCLING/TRANSFER STATION	\$43.75
PERRIS MATERIAL RECOVERY FACILITY	\$40.00
SACRAMENTO RECYCLING & TRANSFER STATION	\$38.50
SUNNYVALE MATERIAL & RECVR'Y & TRNSFR ST	\$33.34
BERTOLOTTI TRANSFER & RECYCLING CENTER	\$52.25
CAL SIERRA TRANSFER STATION	\$83.00
GOLD COAST RECYCLING FACILITY	\$33.50
DEL NORTE REGIONAL RECYCLING & TRANSFER	\$33.50

Evaluation

A. Operating History – Score 4

MRFs have been successfully operated using similar waste streams at comparable sizes for many years. They are used as an industry standard to recover materials. Operations of a MRF are safe if the operator takes care to implement appropriate safety plans.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 4

The diversion potential of this scenario is moderately high, recovering approximately 17% of the incoming refuse stream; overall County-wide diversion from these operations is



Section 5

estimated at approximately 7.7%. The alternative is consistent with the AB939 hierarchy, using methodologies to recycle waste. The MRF could contain a public education center. The alternative works towards the zero waste goals. The alternative will achieve the highest and best use of materials through reuse and recycling of materials.

C. Distribution of Economic Benefits, Social Equity,, and Impacts – Score 4

The alternative would create many new jobs, including many that require little education. The alternative has the potential of teaching workers new skills and is socially equitable enabling all people to gain access to good jobs, education and training, and needed services.

D. Environmental Consequences – Score 3

Potential negative impacts include dust, noise and odors from operation of the MRF. All impacts can be mitigated through appropriate designs and operations of the facility. Positive environmental impacts include reducing the amount of refuse and contaminants applied to land through landfilling. Environmental justice issues are met through the potential for meaningful involvement including: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.

E. Role of Public Sector Entities and JPA Participation Potential – Score 4

The alternative maintains the authority of the County or JPA in managing the solid waste system. The County and or JPA could own and or operate the MRF. The MRF would give these entities control over diversion and costs for processing waste.

F. Regulatory Cooperation – Score 3

If developed and operated appropriately and within permit limitations, regulatory risks and exposure can be minimized. This alternative has the potential to handle waste in an enclosed environmentally controlled building minimizing regulatory risks. The alternative provides the potential for regulatory cooperation with the RWQCB by reducing the amount of waste landfilled.

G. Disposal Needs and Obligations – Score 4

The alternative reduces the need for disposal of waste by 17% of the incoming waste; 7.7% overall. The alternative assists the County in meeting its disposal needs by reducing the amount of waste for disposal. The alternative is not a direct disposal alternative and thus does not contain disposal capacity.

H. Capital Costs – Score 1

The capital cost is in the range of approximately \$15,000,000 to \$25,000,000. The capital components could include design and engineering, equipment, site work, building, off-site improvements, and spare parts. The facility life would be 20 to 30 years.

I. Operating Costs – Score 1

The operating cost is in the range of approximately \$30 to \$45 per ton. Operating costs for this alternative could include labor, stationary and rolling stock maintenance and fuel, utilities, equipment leasing, consumables, G&A, insurance, etc. It should be noted that this cost for materials processing is in addition to disposal costs for the remaining 83% of the incoming waste stream.

J. Cost Per Ton – Score 1

The cost per ton for the alternative is approximately \$35 to \$55 per ton. This includes deduction in costs for potential materials revenues. It should be noted that this cost for materials processing is in addition to disposal costs for the remaining 83% of the incoming waste stream.

K. Siting, Design, Permitting, and Construction Requirements – Score 3

This alternative would require siting, design, permitting, and construction. Assuming that the CDS could be used for siting the MRF development time could be reduced. However, the project will require full CEQA review and permitting through the State and local agencies including the CIWMB; the Local Enforcement Agency would lead this process. The schedule for development of the MRF could be 3 to 4 years.

L. Effect on Current System Costs – Score 1

The effect on current disposal System costs would be an increase of \$35 to \$55 per ton for processed materials. This cost is in addition to the cost for subsequent disposal of the remaining 83% of the waste stream after processing at the MRF. The only offset to this huge increase is the savings for not out-hauling 17% of the refuse for disposal.

Alternative 10 – Development of an Organics Processing Facility

Analysis

BVA has reviewed the past work the County commissioned reviewing the technical, environmental and economic feasibility of developing an Organics Processing Facility utilizing the technologies of Anaerobic Digestion and Biorefining. For the purpose of our analysis, anaerobic digestion is defined as a natural biological process of treating



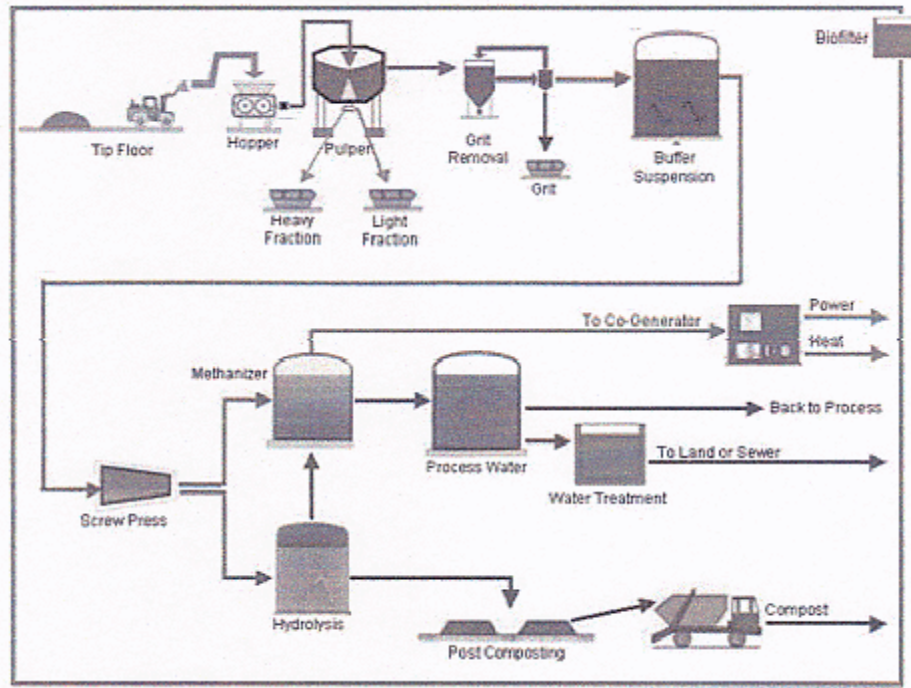
Section 5

biodegradable waste by means of bacterial action, but in the absence of oxygen. The process generates a biogas mixture of methane (CH₄) and carbon dioxide (CO₂) with some other gases depending on the feedstock. The biogas can be used to fuel an engine for electrical production and thermal generation. The process requires stable conditions for temperature and moisture. Likewise, Biorefining, which is also a biochemical fermentation process, employs hydrolysis and fermentation to produce different products such as ethanol and lignin. Ethanol can be used as a vehicle fuel. Lignin can conceivably be used to fire a solid fuel boiler for steam or electricity production.

Although both of these conversion technologies have promise as a means to beneficially extract energy from mixed MSW, the current state of development does not support consideration by Sonoma County in the near to mid-term. Interest exists internationally to develop and demonstrate reliable and cost-effective technology employing both processes, but to date much of the work has been on a small scale pilot basis or on larger scale projects utilizing mainly non-MSW feedstocks or targeted organic components of the MSW stream.

We have been monitoring the Canada Compost Inc. (CCI) anaerobic digestion plant outside of Toronto, Canada in Newmarket, Ontario (See Figure 5-1 below). The plant began operations in 2000. The plant, costing approximately \$26 million, was designed to handle approximately 150,000 tons per year of high organic content MSW, producing 880 million cubic feet of biogas, generating 5.5 MW of power and thermal energy and 60,000 tons of compost. We understand the Plant has required modifications and a local recycling company (Halton Recycling Limited) bought the plant and is making these modifications to support daily operations. The plant requires separate collection of organics, as described in Alternative 3 to operate efficiently. CCI indicates that the cleaner feedstock helps produce higher marketable materials. CCI is also operating a similar, but much smaller pilot-scale anaerobic digestion plant in Toronto. According to information gathered from a European study on this technology, "The Role of New & Emerging Technologies," by Associates in Industrial Ecology (AIE), November 2002, an anaerobic digestion plant of the size and type required by the County could cost as high as \$150 million, with operating costs in the mid \$60 per ton. AIE states that the commercial status is proven on sewage sludge and some pilot-trials on source separated organics; however, the technology needs a medium to large scale commercial MSW pilot as a test-bed. The organization Biogas Works conducted a survey of anaerobic digestion plants throughout the world processing MSW and listed 14 such facilities. Eight of these plants were listed as under construction. The other operating plants of 500 tons per year (TPY) to 85,000 TPY were sized much smaller than the County's requirements of a plant of about 500,000 TPY.

Figure 5-1 | CCI'S Newmarket, Ontario Anaerobic Digestion Plant



In regards to Biorefining, according to the U.S. Department of Energy's Energy Efficiency and Renewable Energy Department, the concentrated sulfuric acid process has been commercialized in the past, particularly in the former Soviet Union and Japan. However, these processes were only successful during times of national crisis, when economic competitiveness of ethanol production could be ignored. Conventional wisdom suggests that these processes cannot be economical due to the high volumes of acid required. Improvements in acid sugar separation and recovery have opened the door for commercial application. Two companies in the United States are currently working with DOE and NREL to commercialize this technology by taking advantage of niche opportunities involving the use of biomass as a means of mitigating waste disposal or other environmental problems. One of these companies, Masada located in Vestavia Hills, Alabama, has applied this technology to municipal solid waste (MSW). Masada holds several patents related to MSW-to-ethanol conversion. DOE and NREL have been working with Masada to support their MSW-to-ethanol plant, which will be located in Middletown, New York. The plant will process the lignocellulosic fraction of municipal solid waste into ethanol using technology based on Masada's concentrated sulfuric acid process. The robustness of this process makes it well suited to complex and highly variable feedstocks, like municipal solid waste. Masada's New York project takes advantage of relatively high tipping fees available in the area for collection and disposal of municipal solid waste. Masada is finalizing engineering and project financing, and expects to break ground on the plant in 2004-2005. Masada's CES

Section 5

OxyNol™ processing facility integrates a materials recovery facility (MRF) with an ethanol production plant in a continuous process. All non-hazardous municipal solid waste is processed in the MRF; metal, glass and plastics are separated for recycling. Remaining waste is dried and shredded, thereby eliminating odor. Once dried and shredded, the waste becomes "biomass feedstock" for the integrated ethanol production plant.

Much of the challenge of going commercial with this technology has to do with the heterogeneous nature of MSW and the effect the material has, even after preprocessing, on the subsequent biochemical process and equipment. Therefore at this stage, reliable performance and cost information are not available. Although these technologies hold a lot of promise and the County should continue to monitor the progress of these technologies, currently embarking on development of an anaerobic digestion or biorefining project is a risky R&D effort. However, if the County develops the MRF discussed in Alternative 9 above, an organics processing facility might fit in well as an adjunct process to handle the large amounts of organic materials separated from recyclables. Again, this alternative should be revisited in a few years when more reliable actual operating history is available.

Another emerging technology that holds promise is the use of steam to separate the organic materials in MSW from the inorganic portions (glass, metals, etc.). The organic fraction can then be further separated into long fibers, which can be used as feedstock for pulp and paper mills, and short fibers, which can be digested to produce biogas and compost. The traditional recyclable materials are also recovered. There is one small pilot plant utilizing this technology in Nevada. The first small commercial scale (250 ton per day) demonstration project is currently under construction in St. Paul, Minnesota. If this demonstration project proves successful, this technology may be appropriate for consideration by the County.

Evaluation

A. Operating History – Score 1

Organics Processing Facilities handling the type of waste (MSW) and the amounts required by Sonoma County have little to no operating history. One of the largest facilities of this type in Newmarket, Ontario is currently making modifications to its process; note this Facility is less than 1/3 the size needed by Sonoma County. They are not used as an industry standard to process MSW. Operations of an Organics Processing Facility should be relatively safe if the operator takes care to implement appropriate safety plans; however, there is little industry experience to base on.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 5

The diversion potential of this scenario is very high; however, there is little to no experience in the United States that justifies these rates. The facility could contain a public education center. The alternative works towards the zero waste goals. The alternative may achieve the highest and best use of materials through reuse and recycling of materials.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 4

The alternative would create many new jobs, including many that require little education. The alternative has the potential of teaching workers new skills and is socially equitable enabling all people to gain access to good jobs, education and training, and needed services.

D. Environmental Consequences – Score 2

Potential negative impacts include dust, noise and odors from operation of the facility. All impacts should be able to be mitigated through appropriate designs and operations of the facility; however, there is little to no experience that supports this. Positive environmental impacts include reducing the amount of refuse and contaminants applied to land through landfilling. Environmental justice issues are met through the potential for meaningful involvement including: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.

E. Role of Public Sector Entities and JPA Participation Potential – Score 4

The alternative maintains the authority of the County or JPA in managing the solid waste system. The County and or JPA could own and or operate the facility. The facility would give these entities control over diversion and costs for processing waste. The facility may give an added benefit for JPA members to participate in the system through guaranteed handling and diversion of waste.

F. Regulatory Cooperation – Score 2

If developed and operated appropriately and within permit limitations, regulatory risks and exposure should be minimized; however, little to no experience to support this exists. This alternative has the potential to handle waste in an enclosed environmentally controlled building minimizing regulatory risks. The largest risk for permitting is from the Bay Area Air Quality Management District (BAAQMD) for air emissions.

G. Disposal Needs and Obligations – Score 5

This alternative greatly reduces the need for disposal of waste. The alternative assists Sonoma County in meeting its disposal needs by reducing the amount of waste for disposal. The alternative is not a direct disposal alternative and thus does not contain disposal capacity.



Section 5

H. Capital Costs – Score 1

The capital cost for an anaerobic digestion facility sized for the entire Sonoma waste stream could be in the range of \$75 to \$150 million. The capital components could include design and engineering, equipment, site work, building, off-site improvements, and spare parts. The facility life would be 20 to 30 years.

I. Operating Costs – Score 1

The operating cost is extremely expensive, in the range of approximately \$60 to \$70 per ton. Operating costs for this alternative could include labor, stationary and rolling stock maintenance and fuel, utilities, equipment leasing, consumables, G&A, insurance, etc., plus the cost of operating a MRF on the front-end.

J. Cost Per Ton – Score 1

While there are no operating facilities in the U.S. to base accurate cost estimates on, studies performed by BVA and others indicate that the cost per ton for this alternative is in the \$75 to \$100 per ton range. This includes credit for potential materials revenues.

K. Siting, Design, Permitting, and Construction Requirements – Score 1

This alternative would require siting, design, permitting, and construction. Assuming that the CDS could be used for siting the Facility development time could be reduced. However, the project will require full CEQA review and permitting through the State and local agencies including the CIWMB; the Local Enforcement Agency would lead this process. Again, the BAAQMD would require control of air emissions from the facility. The schedule for development of the Facility could be 4 or more years.

L. Effect on Current System Costs – Score 1

The effect on current disposal System costs would be to significantly increase costs.

Alternative 11 – Privatization of All or Part of the Solid Waste System

Analysis

Introduction

The consolidation of solid waste systems has increased the amount of private company investment in developing, constructing, and owning facilities. For this alternative, the County would consider selling all or a portion of the publicly owned solid waste system to a private entity. The potential benefits of privatization, including potential cost savings and reduction in responsibility and possible long-term liability, must be balanced with the potential loss of control over guaranteed disposal capacity and cost. In addition, the Sonoma County

ColWMP currently includes a strong and explicit provision to keep the system publicly owned, and this provision would need to be revised prior to privatization. The benefits and risks to the County and other member jurisdictions need to be considered in any analysis of potential privatization.

In California, there is a broad range of experience with privatization. "Privatization" is an often used term that includes a variety of circumstances. Stockton recently sold a landfill and post-closure responsibility for several closed landfills. San Diego County sold its entire landfill system and retains no direct control over capacity or pricing. Riverside County recently decided to privatize transfer station ownership, but keep landfills publicly owned. San Bernardino County and the Salinas Valley Solid Waste Authority retains facility ownership, but provides for long-term operations contracts that also privatize the day-to-day management of the system.

The private sector is often touted as being more "efficient." Some of this efficiency is quite real, such as the ability to rapidly make decisions and act on them. Larger waste management companies have a wealth of experience to draw on from around the country, and of course immediate access to capital. However, other "efficiencies" can be false economies such as poorer wage and benefit packages. For some larger waste management companies, a high internal return on capital is a key profit center with the company acting as its own bank, and the public sector may well have access to less expensive capital. The private sector has a cost that the public sector does not have - the need for a ten to fifteen percent (or higher) corporate overhead and profit margin that can balance out much of the real or perceived gains from efficiency. In summary, while privatization has its benefits it is not always the best solution.

Key Issues for the County

The following are some of the questions that the County should consider prior to deciding to implement privatization. These range from issues of policy, to specific items that can be effectively managed with a well-drafted contract. The most difficult issues are those for which the financial incentive for a private owner might run counter to the public good - such as maintaining increases in diversion over time and management of the rural transfer stations.

- What are the County's motives for privatization? For instance, would it be an attractive alternative other than for the current difficulties with the Central Landfill? The answers to these questions can help determine the scope of any privatization.
- Should operations be privatized with a public agency retaining ownership, or is asset sale preferred? Who would be responsible for closure and post-closure landfill activities if a private company goes bankrupt? These risks could make this option prohibitive.
- Should privatization include both transfer and disposal facilities, or just one or the other?



Section 5

- Should privatization include responsibility for closed sites?
- If privatization includes Central Landfill, and assuming there is future capacity, how will the sale contract include guarantee of capacity for jurisdictions in the County?
- If privatization includes Central Landfill, can the County effectively transfer all long-term liabilities associated with the site?
- How can the County best ensure long-term tip fee protection? Will there be a competitive marketplace in the immediate area after the sale, such that there are other landfills to provide effective control over tip fees?
- How can the County create incentives and disincentives for the new owner(s) to aggressively pursue diversion efforts? In particular with relation to a zero-waste goal?
- How would contractual provisions providing for ongoing decreases in disposal tonnage affect a sale price?
- Would the County allow the new owner/operator to import waste from other counties, and if so with what controls?
- If the County were to sell the transfer system, how would it ensure that services are still available to rural customers and that service reductions do not result in increased illegal disposal that would then become the County's unfunded problem?
- Should the County adopt a policy of private ownership and/or operation for future facilities developed to meet recycling and organics processing needs?
- How will the County address issues of reduced staffing related to the transfer of operations?

A key issue related to a privatization of Central Landfill is timing. There are significant trade-offs in terms of County risk and reward:

- Should the County pursue a sale now while there is uncertainty about future use of the site? The result may be a lower price, but the County would be free of the short-term and long-term liabilities associated with the site.
- Should the County first continue the effort to negotiate a resolution to the regulatory issues at the Central Landfill in an effort to reduce uncertainty about future use of the site? Should the issues be resolved, the County would be in a far better negotiating position and the sale price would be higher. On the other hand, if the issues were to be resolved would the County still wish to consider privatization?
- Finally, the County might continue, but be unsuccessful in an effort to negotiate a resolution to the regulatory issues at the Central Landfill. In this instance, the sale price might well be lower than prior to removal of uncertainty.

Examples of Privatization

Riverside County: The County has a combination of public and privately owned and operated landfills. The County operates the gatehouse and sets the tip fee at the private landfill. The Riverside County Waste Management District was formed in the early 1990's to purchase the principal transfer stations that were then privately owned and operated. Subsequently, the decision was made to instead privatize the publicly owned portions of the transfer system, but keep most landfill ownership public. The District was later disbanded.

San Bernardino County: The County owns a system of transfer stations and landfills and currently contracts all operations, including day-to-day management to Burrtec Waste, Inc. In 1995, the County contracted with Norcal for the privatization of management of the solid waste system and the operation of all County facilities. This agreement was dissolved in 2001 following indictments of several senior County and company officials on corruption charges.

San Diego County: In the late 1990's San Diego County became the only California county to completely privatize a formerly publicly owned facility system. The County received \$170 million for sale of the system to Allied. The County had developed the North County Resource Recovery Facility (NCRRF) waste-to-energy facility with contractual put-or-pay tonnage obligations tied to facility financing, but did not have the flow control requirements in place necessary to bring the required tonnage. The County closed the facility and sold the County system (two large, one medium, and one small sized landfill; one transfer station; 11 container sites; and the NCRRF) as a means of financing the debt. There have been significant concerns that Allied would have monopoly control of facility pricing, but rates have remained stable because the City of San Diego continues to own and operate the Miramar Landfill that accepts waste from other jurisdictions in the County.

City of Stockton: In 2000, Stockton completed sale of two landfills to Allied, Inc. The Austin Road Landfill was located adjacent to Allied's Forward Landfill and Allied has consolidated the landfill with Forward. The City also sold French Camp Landfill to Allied and it is now in closure. The sale took several years to complete, and for an interim period the city conducted an RFP process and contracted with Allied to deliver tonnage to the landfill in order to continue the revenue stream to the city. Initially there had been other interested buyers, but in addition to owning Forward, Allied collects a sizable portion of the local waste stream and could thus guarantee itself an immediate revenue stream. Thus, the sale was effectively made on a sole source basis. City staff believes that Allied did not really wish to purchase the landfills but also did not want to provide entry to a competitor. The sale price was a single payment of \$14.9 million, with four years of annual AB 939 program payments to the city totaling about \$1.5 million. The contract provides for a reduced tip fee for residential waste through 2007 with no comparable reduction for commercial waste. There are no explicit long-term protections for the city regarding tip fee, except to the extent that the city that can influence Allied through its collection franchise with the city. All closure and



Section 5

post-closure liability for the two sites, with the exception of third-party suits was transferred to Allied as part of the sale.

In summary, the above experiences indicate that much depends on the specifics of the situation:

- In San Diego County the market controls tip fees for now but there is no long-term protection once the County's landfills close.
- In San Bernardino County, a combination of privatizing the management of the system and the amounts of money resulted in enticing opportunities for corruption.
- For the City of Stockton, due to site location and local collection arrangements, marketplace, there was only one serious bidder - thus the sale was effectively a sole source arrangement.
- Riverside County decided to retain control of disposal sites, but privatize the rest.

In some cases, a comparison of public and private options indicates that public ownership makes sense:

- The city of Colusa recently continued its municipal collection operation after developing its own proposal and effectively participating in a competitive procurement with the private sector.
- When the city of Citrus Heights incorporated it conducted a procurement to determine whether it would retain Sacramento County as its collector. The County developed a proposal to provide the service and obtained the new contract.
- Lane County Oregon considered privatizing its transfer station system, but following an independent review indicating efficient public operation, the county board decided to keep the system publicly owned.
- The Humboldt Waste Management Authority is now in the process of exercising a buy-out clause in its transfer station development and operation contract with Waste Solutions Group, Inc. The Authority intends to operate the facility and directly negotiate for disposal capacity at out-of-County landfills.

Steps in Pursuing Privatization

The following are key steps for the County in pursuing a privatization of one or more facilities:

- Obtain an independent and confidential assessment of the savings to be gained by private operations and appropriate sale price if this is part of the privatization program.
- Conduct a competitive process for the operations and/or sale similar to that the County is pursuing for obtaining out-of-County landfill capacity.

- Do not entertain sole source proposals.

Evaluation

A. Operating History – Score 3

While there is significant experience with privatization the picture is mixed and the results are often specific to the given situation.

B. Diversion Potential/Consistency with AB 939 Hierarchy – Score 1

It is difficult to maximize the incentive for diversion when privatizing a facility system. If a private company buys a landfill, they will certainly wish to use it. Privatization could be particularly incompatible with a zero waste goal.

C. Distribution of Economic Benefits, Social Equity, and Impacts – Score 2

Economic benefits and impacts could be neutral if the purchaser is a local company and most of the revenue stays within the County. Economic benefits and impacts will be negative if the purchaser is a larger company and much of the revenue is taken out-of-County. Impact will be positive to the extent that jobs stay within the County.

D. Environmental Consequences – Score 3

Environmental consequences should be generally neutral, assuming a good environmental review process and a strong contract.

E. Role of Public Sector Entities and JPA Participation Potential – Score 3

The County will presumably have a significant role in making the decision to privatize, and would have an ongoing role following any sale.

F. Regulatory Cooperation – Score 3

This alternative is neutral with regard to this criterion.

G. Disposal Needs and Obligations – Score 3

This criterion is generally neutral, except to the extent that a sale results in greater incentive to dispose of waste rather than recover it.

H. Capital Costs – Score 3

This criterion is generally neutral; while private sector cost of capital may not be lower there may be an attractive initial cash payment to the County.



Section 5

I. Operating Costs – Score 3

Assuming efficiencies balance with corporate overhead and profit and higher costs of capital, operating costs should be similar to current costs. Operating costs could drop if the new owner delivers waste from other jurisdictions.

J. Cost Per Ton – Score 3

This criterion is generally neutral in impact.

K. Siting, Design, Permitting, and Construction Requirements – Score 3

As a long-term alternative, there is sufficient time to consider and act on the issue. A longer time frame provides for resolution of regulatory issues regarding Central Landfill - one way or the other.

L. Effect on Current System Costs – Score 4

Disposal System costs should remain about the same, or possibly decrease somewhat.

Evaluation and Scoring

The analysis of each alternative was conducted and then evaluated as shown above based on the twelve criteria developed and accepted by the AB 939 Local Task Force (LTF). As discussed in Section 4, the weights for each criterion were developed and agreed upon at the public LTF meeting on October 14, 2004. Each of the criterion and their associated weighted scores are illustrated in Table 5-3 below.

Table 5-3 | Evaluation Criteria and Weights

Criteria	Weight (pts)
Operating History	6
Diversion Potential/Consistency with AB 939 Hierarchy	14
Distribution of Economic Benefits and Impacts, and Social Equity,	6
Environmental Consequences	10
Role of Public Sector Entities & JPA Participation Potential	7
Regulatory Cooperation	7
Disposal Needs and Obligations	9
Capital Costs	6
Operating Cost	7
Cost per ton	9
Siting, Design, Permitting, and Construction Requirements	9
Effect on Current System Costs	10
Totals	100

Each alternative was evaluated with respect to the specified criteria updated from the 2000 Solid Waste Management Alternatives Analysis. The scores were issued as follows:

- Score of 5 – Exceeds Criteria's Objectives
- Score of 4 – Partially Exceeds Criteria's Objectives
- Score of 3 – Meets Criteria's Objectives
- Score of 2 – Meets Some Criteria's Objectives
- Score of 1 – Does Not Meet Criteria's Objectives

The points assigned for each criterion were then multiplied by the weights assigned above and then summed for all criteria evaluated for each alternative. Initial scorings of the alternatives were presented and discussed at both the December 9, 2004 LTF meeting and the general public meeting later that same day. LTF members reviewed the evaluation and scoring of the alternatives and provided comments that were incorporated into the scores shown in Table 5-4.



Section 5

Table 5-4 | Alternative Scoring

Alternative	Score
Short-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County	312
Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste	341
Alternative 3 – Maximize Diversion in the County through Zero Waste Policies	355
Alternative 4 – Expansion of the Central Disposal Site	259
Alternative 5 – Subregional Waste System	232
Long-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul	262
Alternative 3 – Maximize Diversion in the County through Zero Waste Policies	378
Alternative 6 – Development of West Expansion Area	271
Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County	203
Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste	333
Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Handle Recyclables	278
Alternative 10 – Development of an Organics Processing Facility	248
Alternative 11 – Privatization of All or Part of the Solid Waste System	276

Summary Tables

A detailed summary of each evaluation listing among all the alternatives and the twelve criteria is shown in the following tables. Table 5-5 represents a qualitative analysis of the alternatives, while Table 5-6 represents a quantitative analysis of the alternatives using the weights and scoring system described above.

Table 5-5 | Qualitative Summary

													Operating History	Diversification Potential & Consistency with AB 939 Hierarchy	Distribution of Economic Benefits, Social Equity and Impacts	Environmental Consequences	Role of Public Sector Entities & JPA's Participation Potential	Regulatory Cooperation	Disposal Needs and Obligations	Capital Costs	Operating Costs	Cost Per Ton	Siting, Design, Permitting & Construction Requirements	Effect on Current System Costs
Short-Term Alternatives																								
1 - Exporting Solid Waste Outside of County	Conducted for many years	Little to no impact	Potential in-county loss of jobs	Increased transportation impacts	Promotes coordination	Maintain level of cooperation	Meets Disposal Needs	Little to no increase	Little to no increase	Little to no increase	Minimal level of requirements	Little to no impact												
2 - Joint Powers Agency Assumes Greater Responsibility for Solid Waste	Many examples available	Increased potential due to economies of scale and more oversight	Little to no impact	Increases potential environmental benefits	Maximizes JPA Participation	Maintain level of cooperation	No effect on disposal needs	Little to no increase	Little to no increase	Little to no increase	Moderate level of requirements	Little to no impact												
3 - Maximize Diversion in the County through Zero Waste Policies	Many programs implemented	Increased potential	Maximizes benefits and equity	Increases environmental benefits	Maximizes JPA and Public Participation	Maintain level of cooperation	Reduces disposal needs	Little to no increase	Moderate Increase	Moderate Increase	Requirements not significant	Increase of costs												
4 - Expansion of Central Disposal Site	Expansions are commonplace	Diversion will effect cost/ton	Little to no impact	Impacts remain the same	Little to no impact	Receiving minimal cooperation	Provides Additional Capacity	Moderate Increase	No significant increase	Moderate Increase	Moderate level of requirements	Increase of costs												
5 - Subregional Waste System	Less common	Less effective due to less tons and revenues for programs	Decreases benefits and equity	Increased transportation impacts	JPA disbans	Decreased Cooperation	Less waste for disposal	No increase	Moderate Increase	Moderate Increase	Requirements not significant	Increase of costs												
Long-Term Alternatives																								
1 - Exporting Solid Waste Outside of County with Potential for Rail	Conducted for many years	Little to no impact	Potential in-county loss of jobs	Increased transportation impacts	Promotes coordination	Maintain level of cooperation	Meets Disposal Needs	Moderate Increase	Moderate Increase	Moderate Increase	Moderate level of requirements	Increase of costs												
3 - Maximize Diversion in the County through Zero Waste Policies	Many examples available	Maximizing potential	Maximizes benefits and equity	Increases environmental benefits	Maximizes JPA and Public Participation	Maintain level of cooperation	Reduces disposal needs	Little to no increase	Moderate Increase	Moderate Increase	Requirements not significant	Increase of costs												
6 - Development of West Expansion Area	Development common, but more likely in already existing area	Diversion will effect cost/ton	Little to no impact	Potential environmental impacts	Little to no impact	Decreased Cooperation	Provides Additional Capacity	Moderate Increase	No significant increase	Little to no increase	Moderate level of requirements	Little to no impact												
7 - Development of New Long Term Landfill Capacity in the County	Very difficult to site and develop	Diversion will effect cost/ton	Little to no impact	Potential for increased environmental impacts	Little to no impact	Decreased Cooperation	Provides Additional Capacity	Significant Increase	Moderate Increase	Moderate Increase	High level of requirements	Moderate increase												
8 - Develop Multi-County Regional System by Incorporating Adjacent County's Waste	Less common	Little to no impact	Decreases benefits and equity	Increased transportation impacts	Promotes coordination	Increased cooperation	Meets Disposal Needs	Little to no increase	Reduction in Costs	Reduction in Costs	Minimal level of requirements	Little to no impact												
9 - Regional Cooperation to Develop a Materials Recovery Facility to Handle Recyclables	Many MRFs in operation	Increased diversion	Adds new jobs and skill opportunities	Impacts can be mitigated	Promotes coordination	Maintain level of cooperation	Reduces disposal needs	Significant Increase	Significant Increase	Significant Increase	Requirements not significant	Significant increase of costs												
10 - Development of an Organics Processing Facility	Not much successful history	Large diversion potential	Adds new jobs and skill opportunities	Most impacts should be able to be mitigated	Promotes coordination	Potential for decreased cooperation	Reduces disposal needs	Significant Increase	Significant Increase	Significant Increase	High level of requirements	Significant increase of costs												
11 - Privatization of All or Part of the Solid Waste System	Can be common arrangement	May have loss of control in diversion activities	May lose in-county jobs	Little to no impact	Little to no impact	Maintain level of cooperation	No effect on disposal needs	Little to no increase	Little to no increase	Little to no increase	Requirements not significant	Little to no impact												



Table 5-6 | Quantitative Summary

Criteria	Operating History	Diverison Potential & Consistency with AB 939 Hierarchy	Distribution of Economic Benefits, Social Equity and Impacts	Environmental Consequences	Role of Public Sector Entities & JPA Participation Potential	Regulatory Cooperation	Disposal Needs and Obligations	Capital Costs	Operating Costs	Cost Per Ton	Siting, Design, Permitting & Construction Requirements	Effect on Current System Costs	Total Weighted Score
Weights	6	14	6	10	7	7	9	6	7	9	9	10	
Short-Term Alternatives													
1 - Exporting Solid Waste Outside of County	5	3	2	2	4	3	3	3	3	3	4	3	312
2 - Joint Powers Agency Assumes Greater Responsibility for Solid Waste	5	4	3	4	5	3	3	3	3	3	2	3	341
3 - Maximize Diversion in the County through Zero Waste Policies	5	4	5	5	5	3	4	3	2	2	3	2	355
4 - Expansion of Central Disposal Site	5	2	3	3	3	1	4	2	3	2	2	2	259
5 - Subregional Waste System	3	2	2	2	1	2	4	3	2	2	3	2	232
Long-Term Alternatives													
1 - Exporting Solid Waste Outside of County with Potential for Rail	5	3	2	2	4	3	3	2	2	2	2	2	262
3 - Maximize Diversion in the County through Zero Waste Policies	5	5	5	5	5	3	5	3	2	2	3	2	378
6 - Development of West Expansion Area	4	2	3	2	3	1	5	2	3	3	2	3	271
7 - Development of New Long Term Landfill Capacity in the County	1	2	2	1	3	1	5	1	3	2	1	2	203
8 - Develop Multi-County Regional System by Incorporating Adjacent County's Waste	3	3	2	2	4	4	3	3	4	4	4	4	333
9 - Regional Cooperation to Develop a Materials Recovery Facility to Handle Recyclables	4	4	4	3	4	3	4	1	1	1	3	1	278
10 - Development of an Organics Processing Facility	1	5	4	2	4	2	5	1	1	1	1	1	248
11 - Privatization of All or Part of the Solid Waste System	3	1	2	3	3	3	3	3	3	3	3	4	276

Section 6

Integrated System Scenarios

Introduction

In developing the most feasible approach to managing solid waste within Sonoma County, an array of integrated system scenarios were developed using the alternatives identified, analyzed, and ranked in Section 5 as “building blocks.” Thirteen integrated system scenarios were developed and then presented to the AB 939 Local Task Force (LTF) for discussion and comment at the December 9, 2004 meeting. Using input from the LTF, the integrated system scenarios were finalized then ranked by the LTF, as discussed at the end of this section.

To initiate development of the integrated system scenarios, the resultant scores of each of the alternatives, or “building blocks” were considered, as shown in Table 6-1.

Table 6-1 | Alternative Scoring

Alternative	Score
Short-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County	312
Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste	341
Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse & Recycling	355
Alternative 4 – Expansion of the Central Disposal Site	259
Alternative 5 – Subregional Waste System	232
Long-Term Alternatives	
Alternative 1 – Exporting of Solid Waste Outside of Sonoma County with Potential for Rail Haul	262
Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs	378
Alternative 6 – Development of West Expansion Area	271
Alternative 7 – Development of New Long-Term Landfill Capacity in Sonoma County	203
Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste	333



Section 6

Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Divert Non-Source Separated Recyclables from the Refuse Stream (this alternative does not include development of a source-separated recyclables MRF as these are already operated by private industry)	278
Alternative 10 – Development of an Organics Processing Facility	248
Alternative 11 – Privatization of All or Part of the Solid Waste System	276

System Scenario Development

The first step in developing the integrated system scenarios was to identify those “building blocks” or alternatives that should be included as a base in all scenarios. These base alternatives equate to those ranked most favorable in the evaluation (and can be included in all scenarios) and those that are required as part of a comprehensive system.

To begin the analysis, since exporting waste out-of-County was required over the short-term to meet the in-County landfill capacity shortfall, Alternative 1 was included in each scenario. Next, the most favorable alternatives, those alternatives with the highest scores, were selected. The most favorable alternatives included:

- Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste
- Alternative 3 – Reduce Disposal by Maximizing Diversion through Reuse & Recycling (short-term)
- Alternative 3 – Reduce Disposal by Implementing Zero Waste Policies and Programs (long-term)
- Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste

The short-term and long-term Alternative 3 goals were combined for scenario development as Alternative 3 – Maximize Diversion through Reuse/Recycling and Zero Waste Policies. Although Alternatives 2 and 3 should be considered as base “building blocks” as part of each scenario, Alternative 8 needed to be integrated into a separate scenario(s) for analysis as it affects the overall systematic approach for handling Sonoma County's waste.

Next the least favorable alternatives, including those that scored less than 250 analytic points, were reviewed to determine if they could be excluded from the scenarios. The least favorable alternatives included:

- Alternative 5 – Subregional Waste System
- Alternative 7 – Development of New Long-Term Landfill Capacity in the County
- Alternative 10 – Development of an Organics Processing Facility

These results tend to rule out consideration of development of a new in-County landfill, the alternative which received the lowest score of all. The results would also point to not aggressively pursuing the Subregional waste system or development of an organics processing facility. However, since development of the subregional system may not be in the County's control (i.e., large number of jurisdictions leave the system), it should be included in at least one scenario. In addition, although the organics processing facility is not feasible at the present time, it may be promising in the future, especially as an adjunct to handle organics materials separated from a non-source separated MRF. The option for an organics processing facility should be revisited in the near future to determine its viability.

Thus each scenario included:

- Alternative 1 – Exporting of Solid Waste Outside of County (short term)
- Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste
- Alternative 3 – Maximize Diversion through Reuse/Recycling and Zero Waste Policies.

In addition, each scenario needed inclusion of a long-term disposal component to institute once the short-term exportation contract is terminated. For Alternative 4, expansion at Central is estimated to net only about 14 years of capacity at the most recent flow rates and it was combined with other alternatives for long-term disposal capacity. Like-wise, Alternative 6, development of the West Expansion Area, is estimated to net only about 32 years of capacity and was combined with longer term solutions. Thus the possible long-term disposal combinations include (assumes Alternative 7, development of a new in-County site, was eliminated as discussed above):

- Alternative 1 - long-term exporting of waste out-of-County
- Alternative 4 followed by Alternative 1 - expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then exporting waste out-of-County long-term
- Alternative 6 followed by Alternative 1 – developing the West Expansion Area at Central and then exporting waste out-of-County long-term including the potential for waste-by-rail transport
- Alternative 4 and Alternative 6 followed by Alternative 1 – expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then developing the West Expansion Area at the CDS and then exporting waste out-of-County long-term.

These long-term disposal combinations result in the first four scenarios described below:

Scenario A

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste



Section 6

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 1 – Long-term Exporting of Waste Out-Of-County including potential for waste-by-rail transport

Scenario B

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 4 followed by Alternative 1 – Expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then Exporting Waste Out-of-County Long-Term

Scenario C

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 6 followed by Alternative 1 – Developing the West Expansion Area at the CDS and then Exporting Waste Out-of-County Long-Term

Scenario D

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 4 and Alternative 6 followed by Alternative 1 – Expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then developing the West Expansion Area at the CDS and then Exporting Waste Out-of-County Long-Term

Since the Non-Source Separated MRF is a costly alternative for reducing the amount of waste requiring disposal, it was only included as a component in Scenario A, the most costly long-term disposal alternative (to reduce the disposal component of the scenario).

Alternative 9; the Non-Source Separated MRF was added to this Scenario to develop a new Scenario E as shown below. If the MRF becomes economically viable in the future, it can be added back to other scenarios, as appropriate.

Scenario E

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Divert

Non-Source Separated Recyclables from the Refuse Stream

Alternative 1 - Long-term Exporting of Waste Out-of-County

The remaining alternatives to consider include:

- Alternative 5 – Subregional Waste System
- Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste
- Alternative 11 – Privatization of All or Part of the Solid Waste System

Alternative 5, development of a subregional waste system (from members leaving the system) could evolve under any of the above five scenarios. This yields the following five scenarios:

Scenario F

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 5 – Subregional Waste System

Alternative 1 – Long-term Exporting of Waste Out-of-County

Scenario G

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 5 – Subregional Waste System

Alternative 4 followed by Alternative 1 - Expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then Exporting Waste Out-of-County Long-Term

Scenario H

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 5 – Subregional Waste System

Alternative 6 followed by Alternative 1 – Developing the West Expansion Area at the CDS and then Exporting Waste Out-of-County Long-Term



Section 6

Scenario I

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 5 – Subregional Waste System

Alternative 4 and Alternative 6 followed by Alternative 1 – Expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then developing the West Expansion Area at the CDS and then Exporting Waste Out-of-County Long-Term

Scenario J

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 5 – Subregional Waste System

Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Divert Non-Source Separated Recyclables from the Refuse Stream

Alternative 1 – Long-term Exporting of Waste Out-of-County

Alternative 8, development of a multi-county regional system by incorporating adjacent counties waste, would only occur under the scenario that the County was either able to offer in-County landfill capacity or that the counties could combine tonnages to export out of region and take advantage of “economies of scale.” Using Alternative 1, exporting waste out-of-County long-term could be considered in this multi-county regional system. This yields the eleventh Scenario K. Using the long-term disposal components of Scenario D, the County could offer in excess of 30 years of capacity to the other counties. This is considered as Scenario L below.

Scenario K

Alternative 1 – Exporting of Solid Waste Outside of County (short term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste

Alternative 1 - Long-term Exporting of Waste Out-Of-County

Scenario L

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 8 – Develop Multi-County Regional System by Incorporating Adjacent County's Waste

Alternative 4 and Alternative 6 followed by Alternative 1 – Expanding Central (East Canyon, Rock Extraction Area, and North Area Expansion) and then developing the West Expansion Area at the CDS and then Exporting Waste Out-of-County Long-Term

Alternative 11, privatization of the solid waste system is assumed to include privatization of the long-term disposal option. This yields the following scenario:

Scenario M

Alternative 1 – Exporting of Solid Waste Outside of County (short-term)

Alternative 2 – Joint Powers Agency Assumes Greater Responsibility for Solid Waste

Alternative 3 – Maximize Diversion in the County through Zero Waste Policies

Alternative 11 – Privatization of All or Part of the Solid Waste System

The thirteen scenarios are summarized in Table 6-2.

As mentioned above, the thirteen scenarios, including the development analysis, were presented to the LTF for discussion and comment at the December 9, 2005 meeting. The integrated system scenarios were also presented to the general public at a meeting also on December 9, 2005. In addition, each member of the LTF ranked the thirteen scenarios as part of the process of narrowing the field of options for economic analysis. The top ranked scenarios were:

- Scenario D - waste is exported out-of-County for the short-term, the JPA assumes greater responsibility, diversion is maximized through zero waste policies and Central is expanded for long-term disposal
- Scenario I - identical to Scenario D, except that a Subregional waste system is assumed due to a downsizing of the County disposal System to include only the unincorporated County and a couple of jurisdictions (approximately 50% of the existing disposal System), and
- Scenario B - identical to Scenario D, except that after initial expansion of Central, the waste is hauled out-of-County for the long-term.

The ranking of these scenarios and details of the process were further discussed at the LTF meeting on January 13, 2005. Additional comments were provided for incorporation into the text and economics of the alternatives and scenarios. The revised alternatives, scenarios and certain zero waste program economics were presented again to the LTF on March 10, 2005 for their review and approval. Each of these top ranked integrated system scenarios were used in developing the final options for economic analysis discussed in the next section.



Section 6

Table 6 - 2 | Scenario Summary

Scenario	Institutional/Structural Issues	Short-Term Disposal	Facilities	Long-Term Disposal
A	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Export out-of-county with consideration of waste-by-rail for transport
B	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Expand Central and then export out-of-County
C	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Develop West Area at CDS and then export out-of-County
D	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	None	Expand Central & Develop West Area at CDS and then export out-of-County
E	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies	Export out-of-County	Develop MRF	Export out-of-County
F	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Export out-of-County
G	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Expand Central and then export out-of-County
H	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Develop West Area at CDS and then export out-of-County
I	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	None	Expand Central & Develop West Area at CDS and then export out-of-County
J	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop subregional system	Export out-of-County	Develop MRF	Export out-of-County
K	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop multi-county regional system	Export out-of-County	None	Export out-of-County
L	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; develop multi-county regional system	Export out-of-county	None	Expand Central & Develop West Area at CDS and then export out-of-county
M	Pursue greater responsibility for the JPA; maximize diversion through reuse/recycling and zero waste policies; privatize solid waste system	Export out-of-county	None	Private landfill

Section 7

Economic Analysis

Introduction

In summary, through review and analysis of the thirteen integrated system scenarios in Section 6 of this Study as described below, two general options for disposal emerged: development and expansion of the Central Disposal Site (CDS) and out-of-County haul and disposal. Economic analyses were developed for these two disposal options including a variation on each: a more robust containment system for the CDS option versus the planned normal containment system and rail-haul versus the current highway haul for the out-of-County option. Considering these variations, a total of four economic scenarios were developed. In addition, two waste stream sensitivities were tested assuming about 80% and 50% (the later represents unincorporated County and self-haul waste only) of the current disposal System waste stream.

Development of the economic scenarios included review and ranking of the thirteen scenarios by the AB 939 Local Task Force (LTF). Scenarios D, I, and B were the most preferred options. They included:

- Scenario D - waste is exported out-of-County for the short-term, the JPA assumes greater responsibility, diversion is maximized through zero waste policies and Central is expanded for long-term disposal
- Scenario I - identical to Scenario D, except that a Subregional waste system is assumed due to a downsizing of the County disposal System to include only the unincorporated County and a couple of jurisdictions (approximately 50% of the existing disposal System), and
- Scenario B - identical to Scenario D, except that after initial expansion of Central, the waste is hauled out-of-County for the long term.

Using the LTF rankings, the thirteen scenarios were combined and narrowed down to four economic scenarios for analysis to determine the potential cost impacts over a 20 year planning horizon for Sonoma County. As part of the process to develop the economic analysis scenarios, the main factors differentiating the system scenarios and how they were integrated into the economic scenarios were analyzed. The main factors differentiating the integrated system scenarios were:

- Institutional/structural issues
- Short-term disposal options
- Facility alternatives, and
- Long-term disposal options.



Section 7

Each of these factors is discussed below in the context of development of the four economic scenarios.

Institutional/Structural Issues

Recognizing that the institutional/structural issues included two of the same elements for all LTF top-ranked scenarios, pursuing greater responsibility for the JPA, and maximizing diversion through reuse/recycling and zero waste policies, these elements were included in all four economic scenarios. To address these two elements, the analysis maintained funds for the JPA and added in expenses for zero waste policy implementation. Another institutional/structural issue identified under preferred Scenario I, development of a subregional system, was addressed through two sensitivities assuming lower participation rates of 80% and 50% of the current estimated 2005 waste stream. Economically analyzing the development of a multi-county regional system was not modeled, as it was not a top-ranked option and economic benefits could not be easily derived, in the absence of any commitment of tonnage or pricing through the nearby counties surveyed (see Appendix B). If the County wishes to pursue this option in the future, the benefits could be equally realized through all four scenarios. In addition, privatization of County operations was not included in the economic analysis, as it was a very low-ranked alternative. Again, if the County wishes to pursue this option in the future, the benefits could be equally realized through all four scenarios.

Short-term Disposal Options

For all LTF top-ranked system scenarios, the only short-term feasible disposal option identified was to export waste out-of-County. This option was included in all four economic scenarios.

Facility Alternatives

In the 13 scenarios identified, 11 of these scenarios assumed no development of a new facility (two of the system scenarios identified developing a MRF). None of the LTF top-ranked options included development of a new facility, so no new facilities were assumed in the economic scenarios. The MRF was separately analyzed in Section 5 and the cost/benefit was shown not to be feasible to include at this time.

Long-term Disposal Options

The two options analyzed for long-term disposal included: export out-of-County, and development/expansion of the Central Disposal Site (CDS). Although the County could potentially sell the Central Disposal Site to a private operator, this option was not economically evaluated as it was not highly-ranked by the LTF and economic information for this alternative would not be available until bids were secured. The economic scenarios analyzed included both full development of Central and out-of-County export as a basis for

disposal. The LTF top-ranked scenarios D and I included full development/expansion at Central. The other top-ranked Scenario B considered out-of-County disposal after initial Central Landfill developments. Since there is no guarantee that North Coast Regional Water Quality Control Board (RWQCB) permits can be obtained even for the initial Central Landfill development, and the initial development did not cover the study horizon of 20 years, out-of-County disposal was assumed as the other option (without initial Central development).

Using these factors, four economic scenarios that represent the most feasible approaches to the long-term management of Sonoma County waste were developed and analyzed.

Economic Scenarios

Four economic scenarios were developed and analyzed for a period of 20 years from Fiscal Year (FY) 2005-06 through FY 2024-25. Each scenario is described below.

Scenario 1 – Out-haul for Five Years then Re-open Central with Normal Containment System

Economic Scenario 1 was developed from the LTF top-ranked integrated system scenarios by using:

- Institutional/structural issues of pursuing greater responsibility for the JPA, and maximizing diversion through reuse/recycling and zero waste policies
- Short-term disposal option of exporting waste out-of-County, and
- Long-term disposal option for full development of Central.

This scenario is basically Scenario D from the Section 6 analysis.

Scenario 1 represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. The waste will be transported and disposed through three separate contracts with Empire Waste Management (EWM), Keller Canyon Landfill Company (KCLC), and West Sonoma County Disposal Service (WSCD). During these five years, the County would work with the North Coast Regional Water Quality Control Board (RWQCB) to permit the Central Disposal Site for expansion of Phases III, IV, and V of the East Canyon, Phases I, II, and III of the Rock Extraction Area (REA), and the North Area Expansion. Development of these phases would create disposal capacity for an additional 14 years after out-haul to Year 19 or FY 2023-24. In this scenario, we are assuming working with the RWQCB will yield no extraordinary requirements for the containment systems. During this 14 year disposal period at Central, the County will also be working with the RWQCB to permit the West Expansion Site. Development of this site would include preparing an Environmental Impact Report (EIR), purchasing a small portion of the land that the County does not currently own, rock extraction activities and royalties, and construction of the site including impact mitigations, and the moving of the scale facilities. All



Section 7

other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Scenario 2 – Out-haul for Five Years then Re-open Central with a Robust Containment System

Economic Scenario 2 was developed from the LTF top-ranked integrated system scenarios by using:

- Institutional/structural issues of pursuing greater responsibility for the JPA, and maximizing diversion through reuse/recycling and zero waste policies
- Short-term disposal option of exporting waste out-of-County, and
- Long-term disposal option for full development of Central.

Again this is basically Scenario D from the Section 6 analysis, using the more robust containment system and associated costs as discussed in Section 5.

Scenario 2 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in Scenario 1, the waste will be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Again, during these five years, the County would work with the RWQCB to permit the expansion of the Central Disposal Site as discussed above to create disposal capacity for an additional 14 years after out-haul to Year 19 or FY 2023-24. The difference in Scenario 2 is that after working with the RWQCB, robust containment systems would be needed at an additional cost. Again, during this 14 year disposal period at Central, the County will also be working with the RWQCB to permit the West Expansion Site. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Scenario 3 – Close Central Disposal Site and Out-Haul by Highway Transfer Vehicle

Economic Scenario 3 was developed from the LTF top-ranked integrated system scenarios by using:

- Institutional/structural issues of pursuing greater responsibility for the JPA, and maximizing diversion through reuse/recycling and zero waste policies
- Short-term disposal option of exporting waste out-of-County, and
- Long-term disposal option for out-of-County haul and disposal.

This scenario is basically Scenario A from the Section 6 analysis assuming use of highway transfer vehicles for both short- and long-term transfer as discussed in Section 5.

Scenario 3 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in Scenario 1, the waste will

be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Although the Central Landfill is assumed closed for this Scenario, it still makes sense for the County to work with the RWQCB during the initial five year period to permit the expansion of the Central Disposal Site to allow flexibility in its future decisions. This scenario assumes that the County would be unsuccessful permitting the Central Disposal Site and/or unsuccessful in receiving commitments from other jurisdictions to garner flow control. The County's main option would be for long-term out-of-County haul and disposal. This scenario assumes that the out-haul portion of the operations would be by highway transfer vehicle. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Scenario 4 – Close Central Disposal Site and Out-Haul by Rail

Economic Scenario 4 was developed from the LTF top-ranked integrated system scenarios by using:

- Institutional/structural issues of pursuing greater responsibility for the JPA, and maximizing diversion through reuse/recycling and zero waste policies
- Short-term disposal option of exporting waste out-of-County, and
- Long-term disposal option for out-of-County haul and disposal.

Again this is basically Scenario A from the Section 6 analysis, assuming the use of rail for long-term haul as discussed in Section 5 and Appendix D.

Scenario 4 again represents the County hauling and disposing of its waste out-of-County for a period of five years, from FY 2005-06 through FY 2009-10. As in all the other scenarios, the waste will be transported and disposed through the three separate contracts with EWM, KCLC, and WSCD, as discussed above. Although the Central Landfill is assumed closed for this Scenario, it still makes sense for the County to work with the RWQCB during the initial five year period to permit the expansion of the Central Disposal Site to allow flexibility in its future decisions. As in Scenario 3, this scenario assumes that the County would be unsuccessful in permitting the Central Disposal Site and/or unsuccessful in receiving commitments from other jurisdictions to garner flow control. The County's main option would be for long-term out-of-County haul and disposal. This scenario assumes that the out-haul portion of the operations would be by rail. All other activities of the County's solid waste program would remain intact with the possibility of funding additional reuse/recycling programs and zero waste policies.

Economic Analysis Assumptions

The economic analysis assumptions are presented below in two sections, general assumptions common to all scenarios, and scenario specific assumptions pertaining to each



Section 7

of the four economic scenarios individually. In addition, assumptions regarding potential zero waste programs are discussed below.

General Assumptions

These general assumptions are common to all four scenarios and include:

- Funding of JPA diversion and waste reduction programs, including education and diversion planning, and household hazardous waste operations at the FY 2005-06 levels escalated at the assumed inflation rate
- Funding of zero waste programs (see discussion below)
- Continued operations of the four transfer stations at Annapolis, Guerneville, Healdsburg, and Sonoma and use of the Central Tipping Building as an out-haul transfer station
- Continued funding of the general administration activities at the FY 2005-06 levels escalated at the assumed inflation rate
- Continued funding of litter control, capital expenditures at all disposal sites (except Central) and engineering for other capital projects at the FY 2005-06 levels escalated at the assumed inflation rate
- Revenues based on incoming fees to cover the JPA programs discussed above and monies from landfill gas-to-energy plant power sales
- General inflation rate of 4% per year
- FY 2005-06 disposal tonnage estimates of approximately 372,200 tons inflated by 0.95% per year; this figure is based on assumed future growth, off-set by diversion activities; generation rates were based on 2003 CoIWMP estimates of about 3% per year; these figures yield a diversion rate of about 65% in 2015
- Contractual out-haul based on average contractual amounts inflated at 2.0% per year for the first five years
- A \$5 million operating reserve funded over the first five years of analysis (FY2005-06 through FY 2009-10), then escalated at an interest rate of 5% per year

Scenario Specific Assumptions

Scenario 1

- Some capital improvements funded at the Central Tipping Building and Sonoma Transfer Station in FY 2005-06; an annual capital repairs fund is assumed for each year at the assumed general inflation rate
 - Central disposal operations funded starting in FY 2010-11 through FY 2022-23 using the current disposal rate, divided into fixed costs (70%) and variable costs (30%) as
-

indicated by County cost accounting; variable costs fluctuate directly with tonnage changes and are escalated annually at the assumed general inflation rate; fixed costs are not driven by tonnage changes, however are escalated annually at the assumed general inflation rate

- West Expansion Landfill disposal operations funded for the remaining years of this analysis at the current disposal rate assuming 70% fixed costs and 30% of these costs variable with tonnage changes, all escalated annually at the assumed general inflation rate
- Environmental compliance and administration and engineering at Central funded at current, all escalated annually at the assumed general inflation rate
- Central and West Expansion containment systems estimated using a FY 2005-06 amount of approximately \$500,000 per acre for cell development; the total cost was amortized at a 4.5% interest rate over 14 years, assuming a 5% finance charge
- Central closure cost assumed at \$44.3 million less contributions to date of approximately \$8.3 million
- Assumes total post-closure costs, not including Central of approximately \$38 million funded equally over a 30 year period

Scenario 2

All scenario specific assumptions discussed for Scenario 1 above apply except:

- Central and West Expansion containment systems estimated using a FY 2005-06 amount of approximately \$800,000 per acre for cell development

Scenario 3

- No transfer to the Central Disposal Site
- Additional capital improvements funded at all transfer stations to handle long-term out-haul activities
- No Central operating fees, except for initial year funding of \$4.1 million, as Central was operated for part of FY 2005-06
- Central is officially closed in FY 2009-10; environmental compliance funding continues through closure; post-closure fees start after closure in FY 2010-11
- Central closure cost assumed at \$27.0 million less contributions to date of approximately \$8.3 million
- No funding of Central or West Expansion containment systems required
- West Expansion Landfill is not developed



Section 7

- Out-haul funding occurs at same rate contracted over first five years, inflated at 2% per year; although there is a potential for this rate to “jump-up” at the end of the 5 year contract term, we have assumed that competition will maintain the approximate escalated current rate into the future

Scenario 4

All scenario specific assumptions discussed for Scenario 3 above apply except:

- After the first five-year period the waste would be out-hauled using rail
- Rail costs include capital improvements at the transfer stations, rail improvements and haul costs, and out-of-state disposal

Zero Waste Program Assumptions

For each of the scenarios discussed above and the sensitivities analyzed below, implementation of certain zero waste programs was assumed. The zero waste programs assumed for each scenario and sensitivity included:

- Mandatory source separation
- C & D diversion
- Public education
- Commercial outreach and technical assistance
- Market development
- Zero waste research and development
- Local Task Force (LTF) programs

By implementing these programs, it was assumed that diversion would occur at or above the level detailed in the ColWMP. Without implementation of these programs, it was assumed that waste disposal would grow at a rate of about 3% per year with the overall diversion rate remaining stable (no new increases). Economic analysis of implementing the zero waste programs, using these assumptions, proved that the overall net present value (NPV) of total expenses would be less in every case compared to non-program implementation. This is due to the fact that reduction in tonnage and the costs for handling these tons were decreased more than the cost of the actual zero waste programs. The proposed zero waste program costs are estimated to be about \$1,000,000 (in year 2005 dollars) if all programs were implemented. The economic analysis of these programs from a cost per ton perspective yields the opposite result. The smaller number of tons (through diversion) that are available to cover fixed disposal System expenses yields a higher cost per ton. Section 8 discusses possible solutions to this cost per ton issue. For the scenarios analyzed, implementation of the zero waste programs was assumed.

Results

The results of the analysis are shown below in Table 7-1. Detailed pro formas for each of the four scenarios are included in Appendix F. The results are shown in a comparative format by Net Present Value (NPV) of the scenario's expenses and by the required tipping fee in \$'s per ton. The NPV analysis shows that the least cost option at approximately \$471.7 million over the 20 year analysis period, is Scenario 3 – Close Central Disposal Site and Out-Haul by Highway Transfer Vehicle. The next best option at approximately \$484.7 million over the 20 year analysis period is Scenario 4 – Close Central Landfill and Out-haul by Rail. Scenario 1 – Out-haul for Five Years then Re-open Central with a Normal Containment System was the next best option with an NPV of approximately \$518.1 million over the 20 year analysis period. The least favorable option was Scenario 2; Out-haul for Five Years then Re-open Central with a Robust Containment System. The NPV for Scenario 2 was approximately \$537.2 million over the 20 year analysis period.

In analyzing the cost per ton, all scenarios were fairly close in cost over the first 5 years of the analysis. After the first 5 year analysis period, Scenario 2 was about \$5 to \$6 per ton more expensive each year than Scenario 1, due to the more costly containment system assumed in the Scenario 2 analysis. After the first 5 year analysis period, Scenario 4 was about \$3 to \$4 per ton more expensive each year than Scenario 3, due to a slightly higher estimated rail haul component assumed in the Scenario 4 analysis. The rail analysis is detailed in Appendix E of this report. As with the NPV analysis, the cost per ton analysis resulted in Scenarios 3 and 4, out-of-County haul and disposal being less costly than the development of Scenarios 1 and 2, representing in-County disposal. The cost differential between the two disposal options varies widely throughout the years of analysis. The differential is shown to be a low as \$4 per ton (between Scenario 1 and Scenario 4 in year 7) or as high as \$30 per ton (between Scenario 2 and Scenario 3 in year 20).

The results of this comparative analysis include expenses associated with closure and post-closure activities as well as the new proposed zero waste programs. Details of these expenses are shown in Appendix E. It should be noted that both potential “host fees” and fuel costs could affect the balance of the economic analysis. “Host fees” from communities that host the disposal site could be as high as \$12 to \$13 per ton as shown in Appendix B. This level of “host fee” applied to future out-of-County disposal costs could make in-County disposal options more favorable. Assuming current transfer haul distances, fuel costs make up only a minor portion of the overall out-of-County tip fee. Fuel cost should not impact the balance of the overall economic analysis outcome; assuming haul distance does not change dramatically.

Sensitivity Analysis

Two sensitivity analyses were developed to ascertain the effect on the overall economics assuming system tonnage loss. The first sensitivity assumed 80% of the current waste stream in FY 2005-06 or about 297,760 tons delivered to the disposal System. This



Section 7

represents a potential loss of a couple of additional cities to the County disposal System. The second sensitivity assumed 50% of the current waste stream in FY 2005-06 or about 186,100 tons being delivered to the disposal System. This sensitivity represents a County only system. It assumes all unincorporated county waste as well as most of the County self-haul waste. Since the County's waste management budget is based largely on fixed costs, the cost per ton increases in both these sensitivities. This occurs as the County's annual costs do not decrease enough to offset the reduction in tonnage. Certain assumptions were made to both of these analyses to somewhat reduce the costs of operations due to the handling of less tons. Many of the costs were reduced to about 90% of their value for the 80% waste sensitivity; for the 50% waste sensitivity, many of the costs were reduced to about 75% of their value. This was due to the fact that handling fewer tons will result in less expense to the County. These expenses, however, could not be reduced on a "one-to-one" proportion, due to the fixed component of cost as indicated by County cost accounting records. In addition, for the 50% case, closure of the Guerneville Transfer Station was assumed.

The result of each sensitivity case is shown below in Tables 7-2 and 7-3. Detailed pro formas of these two sensitivity cases are included in Attachment F. Analysis of the 80% tonnage scenarios show that although all costs per ton are increased, the tonnage decrease may not be enough to rule out consideration of re-opening the Central Landfill (Scenarios 1 and 2), especially if the jurisdictions involved are committed to in-County disposal. At the 50% tonnage level, we believe the costs are too high to consider in-County disposal through the scenarios representing re-opening of the Central Landfill (Scenarios 1 and 2). If the County does not receive disposal System support and the tonnage levels fall to the 50% level, out-haul appears to be the reasonable disposal alternative.

Table 7-1 Comparative Analysis of Economic Results

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$518.1	\$ 70	\$ 86	\$ 90	\$ 94	\$ 98	\$109	\$	\$103	\$106	\$109	\$108	\$111	\$114	\$117	\$121	\$125	\$131	\$135	\$161	\$148
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$537.2	\$ 70	\$ 86	\$ 90	\$ 94	\$ 98	100 \$115	\$	\$109	\$112	\$114	\$113	\$116	\$120	\$123	\$127	\$130	\$136	\$140	\$166	\$153
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$471.7	\$ 70	\$ 86	\$ 90	\$ 91	\$ 95	106 \$ 94	\$ 93	\$ 95	\$ 98	\$100	\$ 98	\$101	\$103	\$106	\$109	\$111	\$114	\$117	\$120	\$123
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$484.7	\$ 70	\$ 86	\$ 90	\$ 91	\$ 95	\$ 98	\$ 97	\$ 99	\$101	\$104	\$102	\$104	\$107	\$110	\$113	\$115	\$118	\$121	\$124	\$128



Section 7

Table 7-2| Comparative Analysis of Economic Results at 80% Tonnage Levels

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$453.1	\$ 75	\$ 92	\$ 96	\$ 99	\$103	\$110	\$	\$119	\$122	\$137	\$119	\$123	\$126	\$130	\$134	\$139	\$143	\$147	\$152	\$157
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$469.1	\$ 75	\$ 92	\$ 96	\$ 99	\$103	113 \$117	\$	\$125	\$128	\$143	\$125	\$129	\$132	\$136	\$140	\$144	\$149	\$153	\$158	\$162
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$406.4	\$ 75	\$ 92	\$ 96	\$ 98	\$102	120 \$102	\$	\$103	\$106	\$108	\$106	\$108	\$111	\$114	\$117	\$120	\$123	\$126	\$130	\$133
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$416.8	\$ 75	\$ 92	\$ 96	\$ 98	\$102	101 \$106	\$	\$107	\$109	\$112	\$109	\$112	\$115	\$118	\$121	\$124	\$127	\$131	\$134	\$137

Table 7-3| Comparative Analysis of Economic Results at 50% Tonnage Levels

Scenarios	NPV of Expenses (millions \$'s)	Tip Rate by Year Including Zero Waste Expenses (\$/ton)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Scenario 1 - Outhaul for 5 Years then Re-open Central with Normal Containment System	\$367.2	\$ 87	\$ 110	\$ 116	\$ 119	\$ 125	\$ 145	\$	\$ 154	\$ 158	\$ 163	\$ 159	\$ 164	\$ 170	\$ 175	\$ 181	\$ 187	\$ 193	\$ 199	\$ 210	\$ 217
Scenario 2 - Outhaul for 5 Years then Re-open Central with a Robust Containment System	\$379.3	\$ 87	\$ 110	\$ 116	\$ 119	\$ 125	150 \$ 153	\$	\$ 161	\$ 166	\$ 170	\$ 167	\$ 172	\$ 177	\$ 182	\$ 188	\$ 194	\$ 200	\$ 206	\$ 217	\$ 224
Scenario 3 - Close Central Landfill and Outhaul by Truck	\$308.5	\$ 87	\$ 110	\$ 116	\$ 118	\$ 123	157 \$ 127	\$	\$ 127	\$ 130	\$ 133	\$ 128	\$ 131	\$ 135	\$ 138	\$ 142	\$ 146	\$ 150	\$ 154	\$ 158	\$ 162
Scenario 4 - Close Central Landfill and Outhaul by Rail	\$315.0	\$ 87	\$ 110	\$ 116	\$ 118	\$ 123	124 \$ 131	\$	\$ 130	\$ 133	\$ 136	\$ 131	\$ 135	\$ 139	\$ 142	\$ 146	\$ 150	\$ 154	\$ 158	\$ 162	\$ 167



Section 7

This page left blank.

Section 8

Results and Recommended Action Plan

This Study focused on development and analysis of potential short- and long-term plans for management of Sonoma County's solid waste. The key steps of this process, presented in the order they were performed, are detailed below.

- Reviewing background information and waste stream data to develop certain assumptions and establish a basis for assessment
- Development of twelve distinct screening and evaluation criteria using the criteria identified and approved as part of the Solid Waste Management Alternatives Analysis Project in December 2000 as a basis; criteria were reviewed and accepted by the AB 939 Local Task Force (LTF)
- Assignment of weights for the criteria and defining scoring protocols for scoring the alternatives by each criteria; these were reviewed and decided upon by the LTF
- Development, analysis, and evaluation of eleven short- and long-term alternatives including review and acceptance by the LTF
- Scoring each of the eleven alternatives with respect to each of the twelve weighted criteria
- Calculating the overall weighted scores of each alternative and ranking them
- Using the alternatives as "building blocks" to develop thirteen integrated system scenarios based on feasible combinations of the ranked alternatives
- Ranking of the thirteen integrated system scenarios by the LTF
- Utilizing the rankings to narrow the scenarios for economic analysis to four final integrated system scenarios; two scenarios including in-County disposal and two scenarios including out-of-County haul and disposal
- Conducting a 20-year economic pro forma analysis on each of the four final scenarios, and
- Performing sensitivity analyses assuming 20% and 50% reductions in Sonoma County tonnages on the final four scenarios.

The final scenarios analyzed for this study included:

- Scenario 1 – Out-haul for Five Years then Re-open the Central Disposal Site (CDS) with a Normal Containment System
- Scenario 2 – Out-haul for Five Years then Re-open the CDS with a Robust Containment System
- Scenario 3 – Close the CDS and Out-Haul by Highway Transfer Vehicle



Section 8

- Scenario 4 – Close the CDS and Out-Haul by Rail

These four scenarios contain all the basic components that ranked high in the analysis and evaluation steps including:

- Short-term out-of-County haul to address the current lack of permitted disposal capacity at the CDS
- The SCWMA assuming more responsibility for management of the solid waste system
- Reducing disposal by maximizing diversion through reuse & recycling, and
- Reducing disposal by implementing zero waste policies and programs.

The two basic differences in the economic analyses are the assumptions for long-term disposal (after the initial 5 year out-haul period). Scenarios 1 and 2 assume re-opening the CDS in FY 2010-11 and disposing of waste through permitting of the East Canyon, Rock Extraction Area, and Northern Compost Area for about 14 years of additional capacity at current disposal levels; then developing the Western Expansion Area for an additional 32 years of capacity. In scenarios 3 and 4 it is assumed that the County will not be able to permit in-County landfill capacity at the CDS and will have to continue some form of out-of-County long haul after year 5.

In-County Disposal

A strong preference for developing and maintaining in-County landfill capacity at the CDS was observed through meetings and discussions with the AB 939 LTF and the public in attendance at the various meetings. The County Integrated Waste Management Plan (CoIWMP) supports this preference as during the short-term period of 2003-2008, the CoIWMP calls for development of siting criteria for a new landfill. The plan is for 50 years of disposal capacity. For the period 2009-2018, the CoIWMP calls for the siting process to continue with information being fully disclosed to the public, including procedures for selection or elimination of potential sites. In addition, maintaining in-County permitted landfill capacity at the County controlled CDS negates the risk of losing future capacity in the out-of-County disposal scenarios. If the County does not directly control its future disposal options through in-County disposal at the CDS, there is no assurance (even through contractual measures) that out-of-County disposal resources may continue to maintain available capacity. In addition, if there is capacity, it could potentially only be available at an extraordinarily high cost to the County.

Although this scenario is preferred by the LTF (and the public participating in meetings), to mitigate the risk of future capacity availability and to take care of the County's own waste, there is a substantial risk that the County will not be able to obtain permits for the needed in-County landfill capacity. Although the County has been working continuously with the North Coast Regional Water Quality Control Board (RWQCB) to gain approval for developing capacity at the CDS, whether a permit will be approved is still unknown. In fact,

as described throughout this Study, the existing regulatory prohibition on expansion of the landfill has forced the County to begin to out-haul all of its waste starting as of September 1, 2005.

There is also risk to the County from a financial standpoint. The economic analysis determined that re-opening the CDS as shown in Scenarios 1 and 2 is somewhat more expensive than out-of-County haul as shown in Scenarios 3 and 4. The economic differences shown using the net present value (NPV) of expenses over a 20-year period were estimated to be \$518.1 and \$537.2 million for scenarios 1 and 2, respectively, and only \$471.7 and \$484.7 for scenarios 3 and 4, respectively.

A potentially larger risk is the financing for required improvements at CDS and potentially the West Expansion Area. The economic analysis shows that approximately \$51.6 to \$70.4 million (depending on the requirements of the RWQCB) would be needed for development of future phases at the CDS for about 14 additional years of capacity. Development of the West Expansion Area is estimated to cost approximately \$107.1 to \$125.6 million (depending on the requirements of the RWQCB) for approximately 32 additional years of capacity. The County was able to secure financing in the past without flow control, based on the long standing stability of the System. Given the loss of Petaluma waste and the interim closure of the CDS, the County will likely not be able to secure future financing for the required improvements without waste flow commitments from the cities. Financial institutions require assurances that any loans, typically in the form of bonds, are secure through projected revenues. In the case of a waste management system, they look to waste flow control commitments from the facility users to guarantee tonnage and thus revenues to the system for debt repayment. Before considering any level of financial commitment, the County needs to consider why they would take on additional financial risk without any commitment from the cities.

Despite the fact that there have been no new landfills sited/developed (public or private) in Northern California since 1992, and acknowledging the risks discussed above, nothing in these recommendations would prevent the County from evaluating and beginning the search for a new, in-County landfill consistent with the existing CoIWMP.

In summary, the pros and cons of in-County disposal at the CDS include:

Pros

- More direct control of future disposal capacity
- More direct control of disposal costs
- Consistent with the current CoIWMP
- Support from LTF and the public

Cons

- Is more costly than out-of-County haul and disposal



Section 8

- Will likely require flow control commitments from cities to support the financing of required improvements
- It is unknown whether the RWQCB will permit the CDS or West Expansion Area for future disposal
- After re-opening Central, there is a possibility of future regulatory prohibitions that could be instituted at anytime causing unplanned immediate closure or restrictions; this could dramatically drive up costs, although private landfills could experience the same issue, out-haul contracts require them to provide alternative arrangements if their facility is shut down.

Out-of-County Haul and Disposal

In response to the lack of regulatory permitted landfill capacity, the County has recently contracted for out-of-County haul and disposal through three separate companies for a five-year period beginning September 1, 2005. This was necessitated by the current RWQCB prohibition on expansion of the CDS. Even if a permit to expand was granted soon, it could take 2 to 3 years to develop the infrastructure (design, bidding, construction, etc.) to accept waste at the new cell.

The County is in a somewhat favorable position in regards to out-of-County haul and disposal. The County operates and maintains a series of transfer stations that allows for direct transfer to an out-of-County disposal site. The transfer stations may need some minimal capital improvements if the out-haul scenario was considered for the long-term, however, the County owns the front-end transfer infrastructure and thus capital cost improvements will be minimal. Another positive factor is that the County owns the sites and is already permitted to operate these transfer facilities, so no additional site acquisition, regulatory, or permitting activities are anticipated. The economic analysis indicated that the out-haul scenarios are less expensive when compared to in-County disposal as discussed above. Although flow control may be important for in-County disposal commitment, it is less critical than for the scenarios which rely on development of out-of-County haul and disposal, as very little capital investment is required and the operating costs are more easily reduced should tonnage leave the disposal portion of the System. In addition, Scenario 4 introduces the possibility of utilizing rail for long distance transport. Developing the rail system to handle waste will be beneficial to the community as a potentially environmentally friendly and possibly lower cost mode of transport for businesses as well as the public.

The potential downside to out-of-County haul and disposal is the risk of losing disposal capacity sometime in the future. Although the County may contract for certain capacity, there is no assurance that this capacity will always be available. Without ultimate control of the landfill gate, out-of-county disposal sites could refuse the County's waste. In addition, without this control, costs could rise to exorbitant levels. As discussed above, the CoIWMP dictates the future use of in-County disposal. Long-term out-of-County haul and disposal

would require amendment of the ColWMP and conducting a California Environmental Quality Act (CEQA) process. The LTF supports in-County disposal as well.

In summary, the pros and cons of out-of-County haul and disposal include:

Pros

- Less expensive than in-County disposal
- Very little capital improvement funds required
- Transfer station infrastructure in place
- No additional regulatory/permitting actions needed
- Requires somewhat fewer flow control commitments
- More flexible from an operational and operating cost standpoint
- Could help develop rail infrastructure for Sonoma County

Cons

- Not consistent with the current ColWMP; ColWMP will need amending and CEQA process required
- Not supported by the LTF and public
- Potential loss of ultimate control over disposal capacity; although the County could have some protection through strong enforceable contract rights
- Although the County has contracts, they could be held “hostage” as to future capacity and cost issues

Tonnage Sensitivity Analysis

Currently, the County does not have waste flow control agreements with the incorporated cities within Sonoma County. The County is continuing to conduct ongoing discussions with the cities regarding this issue. Accordingly, we have analyzed two possible scenarios that could likely face the County: 1) the County gains the needed flow control commitments from all or most of the cities (assumed at 80% to 100% of the current waste flow) or 2) the County is unsuccessful in acquiring any commitments and needs to resize its disposal System based on unincorporated and self-haul tonnages (assumed at 50% of the current waste flow). In developing the recommendations discussed below, we have included both scenarios.

Recommendations

By contracting for out-haul over the short-term five year period, the County has allowed itself time to address the continued future management of the disposal System. There are many



Section 8

strategic issues that need timely review, discussion and decisions. Recommendations are described below.

- **Determine Extent and Form of System Participation.** The first and most important task for the County is defining the make-up of the County disposal System. The County needs to work with the cities to garner their commitment to the disposal System. This includes selecting the appropriate institutional arrangements (County continues as lead agency, new or modified joint powers authority, etc.) and developing necessary contractual commitments with the cities to continue allowing them to be part of the disposal System. If the County does not receive commitment from the cities, the County will need to assess the amount of waste and sources that will remain in the disposal System. Assuming unincorporated county and self-haul tonnage, the disposal System should retain approximately 50% of its waste. If this scenario presents itself, the County will need to reform the disposal System infrastructure, which may include such service reductions as closing certain transfer stations, reducing days and hours of other transfer stations, and reducing disposal and diversion plans according to reduced available funds. In addition, in-County disposal is not feasible at the 50% waste level scenario due to the projected higher per ton costs and the potential difficulty in obtaining financing for a smaller waste commitment.
- **Joint Decision Making.** Long-term participation in the disposal System will likely entail giving the cities a voice through appropriate contractual and institutional arrangements and voting protocols to assist in disposal System decisions regarding cost, diversion, and disposal. Cities that cannot make a long-term, contractual commitment to the disposal System must be dropped from consideration as appropriate. Side contracts for diversion, transfer or other activities can still be considered by non-disposal System cities for a contractually specified scope, timeframe and specified cost, if advantageous to the County and participating municipalities. The County needs to understand which cities will agree to a commitment of tonnage and for what duration before the County can select and implement future options. These decisions should be made jointly with the partnering cities. In future contractual and financial issues the risks must be shared with all parties. This also includes sharing the rewards, such as lower disposal costs (through economies of scale), as well as higher diversion rates, through shared programs and facilities. The County should set a schedule to secure commitments for contractual flow control from the cities, as feasible by the Summer of 2006, so that it can stay on track to achieve its goals. This schedule is shown in Table 8-1, the Action Plan, as the County has many time sensitive steps to take to put plans in place to properly manage Sonoma County's solid waste.
- **Disposal System Infrastructure Reformation (as needed).** As discussed above, if the County cannot garner waste flow control commitments from the cities, and the participation rate falls to approximately 50%, reformation of the disposal System will

- be required. Understanding the current situation, the County should continue negotiations with the cities for flow control. However, if no agreement is in sight by the Summer of 2006, the County will need to move ahead with its planning assuming the resultant County waste stream is only about half of its current size. If this is the case, a detailed evaluation of the necessity, benefit, and cost of each service currently offered along with a prioritization of service cuts and cost reduction activities to bring County costs in line with available financial resources will need to be developed. This plan will need to be designed with specific steps annotated for providing services to accommodate a much smaller waste stream.
- **Recovery of Unfunded Liabilities.** The County has not accrued sufficient monies for the closure and post-closure care of CDS for two reasons: 1) because closure estimates have dramatically increased and the site is currently closed and 2) because post-closure accruals are not legally required and therefore, were planned to be funded by on-going system participation. For those cities that choose not to participate in the disposal System, the County needs to negotiate a plan to recover their share of monies for closure and post-closure activities at the CDS. If voluntary negotiations are not successful, cost recovery through legal mechanisms will be necessary.
 - **Reduce & Recycle and Zero Waste Plans.** Regardless of the long-term disposal method selected, it makes environmental sense to reduce the amount of waste requiring disposal. It was shown in Section 7 – Economic Analysis, the NPVs of the combined expenses over a 20-year period for incorporating the Zero Waste plans are less than that for the scenarios that do not incorporate the Zero Waste plans. This is due to a reduction in waste needing to be handled through transfer and disposal operations. The cost for the implementation of the Zero Waste plans is more than offset by the savings for handling the difference in tonnage. The economic analysis of these programs from a cost per ton perspective yields the opposite result. The fewer number of tons (through diversion) that are available to cover fixed disposal System expenses yields a higher cost per ton. As the disposal tip fee cannot feasibly support this higher cost per ton for the programs, other support fee structures need to be implemented. Governments can fund services through user fees, general taxes, special taxes, and property assessments. The fees for these programs could be placed on the users through the “up-front” collection of waste and recyclables. The “up-front” collection charge would not help cover costs for the self-haul portion of the waste stream. Recognizing that currently, about 37% of the waste for disposal is received from self-haulers, a separate user fee at the disposal site might be needed for this segment of the waste stream. The County could also consider instituting a tax or an assessment on property, although this would require a ballot measure. The County needs to seriously consider these other funding mechanisms for waste reduction, recycling and zero waste plans and programs, as funding through the disposal tip fee is impractical. It should be noted that long-term



Section 8

the level of Zero Waste program implemented will likely have to be reduced significantly if the cities do not participate financially in the program.

Combining this approach with out-of-County disposal provides more direct cost savings through reduced haul costs and disposal charges at someone else's disposal site. After determining the participating jurisdictions in the Sonoma disposal System, the participants should create a task force to specifically look into the details of each recommended reduction, recycling, and zero waste plan component. Individual plan components should be designed and approved and then set-up for specific bidding. After actual bids are received for the components of the plan, the participating System member agencies can decide feasibility for adoption and implementation.

- **In-County Disposal.** As discussed above, development of in-County disposal capacity may not be achievable with regard to regulatory acceptance. However, if a large segment (at least approximately 80% as shown in the economic analyses of Section 7) of the waste stream can be committed through flow control agreements, and there is buy-in by the cities to finance and operate an in-County disposal site, the County should proceed with this development. This would include further negotiations with the RWQCB for permitting disposal capacity at the CDS and preparing to issue bonds supported by the System members for capital improvements. However, the County needs to plan for its future to be consistent with other goals and activities, so if the County does not have majority support for the regulatory and financial requirements of this activity and are unsuccessful in gaining approvals from the RWQCB by the Summer of 2007, the recommendations involving long-term out-of-County disposal, as described below must be pursued. In addition, as discussed previously, in-County disposal is not feasible at the 50% waste level scenario due to the projected higher per ton costs and the potential difficulty in obtaining financing for a smaller waste commitment. Thus, if waste commitments from the cities are not garnered to at least reach the 80% participation level, the County will need to implement plans for long-term out-of-County haul and disposal.
- **Potential Private Ownership and/or Operation of CDS.** If the cities provide no financial or contractual support for future County operations at the CDS, out-of-County haul and disposal as discussed below should be pursued. In parallel with these activities, the County should also explore the potential sale of the CDS to a private owner/operator. The private owner/operator may be able to work with the RWQCB to garner approval for capacity development. The private operator may also have available internal funds to finance infrastructure improvements at the CDS. Either way, if the County decides not to pursue continued development and operation itself at the CDS, they should consider allowing a private company to investigate potential feasible options.

The first step is for the County to complete an independent valuation of the CDS from the perspective of a private owner/operator. This will allow the County to better understand the assets and liabilities of the CDS. Before initiating any procurement process the County should then contact potential landfill owners and operators to garner their interest. The County should also solicit their ideas for terms and conditions of any sale/operations agreement. In any event, if there is a reasonable degree of interest, the County should release a request for proposals (RFP) document to allow for competitive proposals. After reviewing proposals, the County will be in the position to decide whether to pursue the sale/operations of the CDS. Contract development and negotiations regarding future County and cities use, liabilities, etc. will be one of the most critical components of this option. This activity could occur in parallel with pursuit of long-term out-of-County haul and disposal as discussed in the following paragraph. The County should set a date of late-2007 to make a decision on the sale and/or operations of the CDS to a private company. The sale of other County solid waste facilities such as the transfer stations could also be considered, however appropriate long-term contracts for use of the facilities would need to be garnered.

- **Out-of-County Haul & Disposal.** Although it is recommended to investigate potential private sale and operation of the CDS, the County should concurrently focus on implementing a plan for long-term out-of-County haul and disposal. The County has two basic options for out-haul and disposal; highway vehicle transfer or waste-by-rail (WBR) transfer. The option of rail haul is very intriguing, as a number of out-of-state disposal sites have extremely large amounts of disposal capacity available. In addition, according to some of the operators, they are currently willing to make financially attractive deals for guaranteed long-term waste deliveries. If rail is not already developed to their disposal site, some rail operators indicated their willingness to financially support the inter-modal infrastructure requirements on the disposal site side of the rail transport system.

Our initial assessment of WBR for the County indicates that it may be feasible. Preliminary cost estimates show that rail haul may be economically competitive with highway transfer and disposal. The first step in this process is for the County to discuss future potential WBR operations with the North Coast Rail Authority (NCRA). It should be incumbent on the NCRA to present an operational plan including all fiscal information and a schedule for implementation that supports long-term success of WBR. This should occur by late-2007. The County in conjunction with the NCRA should next initiate a formal competitive procurement process by issuing an RFP. A competitive procurement process is usually the best method for obtaining the most reasonable offers. The procurement process should specifically solicit rail, as well as highway transfer vehicle transport.

- **Reassessment of Materials Recovery Facility (MRF).** This Study concluded that although a MRF would be helpful in handling non-source separated mixed materials



Section 8

generated by the County's residents and businesses; currently a MRF isn't economically feasible. The cost for developing and operating the MRF cannot be currently offset through savings by diverting materials from disposal. In addition, without the County being supported by the local cities through flow control commitments, the financing of such a facility could be difficult as financial institutions always look to these commitments for security in repayment of the bond proceeds.

However, the County should continue reassessment of developing a MRF in the near future as technology advances, equipment costs decrease, and transportation and disposal costs increase. Implementation of a materials recovery facility could make economic sense in the next few years.

- **Review Conversion Technologies.** Conversion technologies, technologies that convert waste into useful by-products such as fiber, compost, and energy, may be beneficial to the County in the near future. Although most are currently only in the pilot stage, careful monitoring of these technologies and advancements should not be forgotten. There are a number of studies currently being conducted (City and County of LA, Santa Cruz County, and the Salinas Valley Solid Waste Authority) and pilot plants being planned (Sacramento, San Francisco, etc.). Implementation of a conversion technology could be a good alternative for the County, especially if the CDS remains closed. The County should monitor their progress and conduct a formal reconsideration in 2 to 3 years; in enough time that the results can be used in the big decisions regarding long-term out-haul. In fact, if it looks promising, the County could include this as an option (just as rail haul) in the RFP for long-term waste management.

Action Plan

A detailed action plan, including steps, beginning and ending dates, and notes is included as Table 8-1.

Section 8

Table 8-1| Action Plan

Line	Action Plan Steps	Begin	End/Deadline	Notes
1	I. Implement short-term out-of-county haul and disposal	September-05	August-10	Assumes to continue for approximately 5 years
2	II. Continue permit process for Rock Extraction Area with Water Board	Current	July-06	Approximately 5 years of capacity at current tonnage levels
3	III. Continue permit process for East Canyon Area with Water Board	Current	July-06	Approximately 6 years of capacity at current tonnage levels
4	IV. Continue permit process for North Canyon Area with Water Board	Current	July-06	Approximately 3 years of capacity at current tonnage levels
5	V. Adopt and implement zero-waste policies	Current	On-going	Will reduce amount of waste to be landfilled
6	VI. Work with cities to obtain participation commitments	Current	July-06	Need decision whether in or out of system for future planning & funding
7	A. If a majority of cities agree to participate by deadline	July-06	July-06	Need at least 80% of total waste stream
8	1. Form a joint decision making body	July-06	October-06	Give representation and voice to all cities on future waste plans
9	a. Continue permit process for Rock Extraction Area with Water Board	July-06	July-07	One year for permitting with backing of jurisdictions
10	b. Continue permit process for East Canyon Area with Water Board	July-06	July-07	One year for permitting with backing of jurisdictions
11	c. Continue permit process for North Canyon Area with Water Board	July-06	July-07	One year for permitting with backing of jurisdictions
12	i. Develop and submit expansion designs for review and approval by Water Board	July-06	July-07	Assumes designs on all three areas
13	If Water Board approves permit application(s) by deadline	July-07	July-07	Require all three areas permitted
14	Check economic feasibility of Water Board requirements	July-07	September-07	If Water Board requirements are too expensive, may be unfeasible
15	If economically feasible	September-07	September-07	If Water Board requirements are too expensive, may be unfeasible
16	(a) Finalize design and specifications	October-07	January-08	On at least REA, however better to work all three areas at same time
17	(b) Obtain remainder of permits and approvals	February-08	January-09	On at least REA, however better to work all three areas at same time
18	(c) Procure construction company	February-09	May-09	On at least REA, however better to work all three areas at same time
19	(d) Begin construction	June-09	May-10	On at least REA, however better to work all three areas at same time
20	(e) Finalize Construction/Begin operations	May-10	September-10	On at least REA, however better to work all three areas at same time
21	(f) Begin permit process with Water Board for West Canyon expansion	October-07	October-07	Approximately 32 years of capacity at current tonnage levels
22	If Water Board denies permit application by deadline or the project is not economically feasible	July-07	July-07	Any of the three areas
23	Develop long-term out-of-county haul and disposal plans	July-07	December-07	Update long-term solid waste plans
24	Finalize flow control agreements with cities to specify tonnage for haul and disposal bids	July-07	September-07	Requires cities to decide whether in or out for future development & financing
25	Re-evaluate feasibility of developing MRF(s)	July-07	December-07	Re-examine MRF feasibility to reduce tonnage before long-haul
26	If MRF(s) is feasible			
27	(a) Design and permit	December-07	April-09	16 months for design & permitting (depends on compnent selection)
28	(b) Construct	May-09	May-10	12 month construction period (depends on compnent selection)
29	(c) Begin operations	May-10	May-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
30	Re-evaluate feasibility of developing conversion technology(ies)	July-07	December-07	Re-examine conversion tech feasibility to reduce tonnage before long-haul
31	If conversion technology(ies) is feasible			
32	(a) Design and permit	December-07	April-09	16 months for design & permitting (depends on compnent selection)
33	(b) Construct	May-09	May-10	12 month construction period (depends on compnent selection)
34	(c) Begin operations	May-10	May-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
35	Obtain long-term out-haul permits & prepare EIR	January-08	January-09	Assumes 12 months to obtain EIR/permits
36	Amend County Solid Waste Management Plan	January-09	July-09	Assumes acceptance as no other option may be available
37	Procure bids for haul and disposal with option for rail haul	August-09	February-10	Assumes 6 month bid process
38	Select and negotiate with company to provide haul and disposal services	March-10	May-10	Assumes 2 months for negotiations
39	Begin out-haul operations	September-10	September-10	Assumes operation by end of short-term hauling & disposal contract
40	B. If none or less than a majority of cities agree to participate by deadline	Current	July-06	Assumes approximately 50% of total waste stream
41	1. Conduct study of County infrastructure reformation	July-06	October-06	Study details how to sturcture County with half its waste stream
42	2. Initiate restructuring plans	October-06	October-06	
43	3. Consider sale of CDS to private companies	November-06	November-06	Private company to own/operate CDS; work with Water Board for permitting
44	4. Develop long-term out-of-county haul and disposal plans	December-06	December-07	Update long-term solid waste plans
45	5. Finalize flow control agreements with cities to specify tonnage for haul and disposal bids	December-06	February-07	Requires cities to decide whether in or out for future development & financing
46	6. Re-evaluate feasibility of developing MRF(s)	December-06	December-07	Re-examine MRF feasibility to reduce tonnage before long-haul
47	a. If MRF(s) is feasible			
48	Design and permit	January-08	May-09	16 months for design & permitting (depends on compnent selection)
49	Construct	June-09	June-10	12 month construction period (depends on compnent selection)
50	Begin operations	June-10	June-10	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
51	7. Re-evaluate feasibility of developing conversion technology(ies)	December-06	December-07	Re-examine conversion tech feasibility to reduce tonnage before long-haul
52	a. If conversion technology(ies) is feasible			
53	Design and permit	June-09	June-10	16 months for design & permitting (depends on compnent selection)
54	Construct	June-10	June-10	12 month construction period (depends on compnent selection)
55	Begin operations	December-06	December-07	Assumes operation by end of short-term hauling & disposal contract (depends on compnent selection)
56	8. Obtain long-term out-haul permits & prepare EIR	January-08	January-09	Assumes 12 months to obtain EIR/permits
57	9. Amend County Solid Waste Management Plan	January-09	July-09	Assumes acceptance as no other option may be available
58	10. Procure bids for haul and disposal with option for rail haul	August-09	February-10	Assumes 6 month bid process
59	a. Select and negotiate with company to provide haul and disposal services	March-10	May-10	Assumes 2 months for negotiations
60	b. Begin out-haul operations	September-10	September-10	Assumes operation by end of short-term hauling & disposal contract
61	VII. Negotiate with cities for recovery of unfunded liabilities	Current	On-going	Recover monies to cover closure and post-closure activities
62				

This page left blank.

APPENDIX A

System History

SONOMA COUNTY SOLID WASTE SYSTEM HISTORY

1940 - 2004

**Sonoma County
Department of Transportation
and Public Works**

November 2005

Sonoma County Solid Waste System History

1940 - 2004

Table of Contents

	PAGE
1. Planning, Operation and Management History.	1
2. Disposal Costs, Fees and Quantities.	2
3. Appendices	
3.1 Solid Waste System Planning History	
A. Summary of Preliminary Solid Waste Disposal Plan for Sonoma County Prepared by Sonoma County Road Department, 1967	5
B. Summary of Solid Waste Management Plan for Sonoma County, California Prepared by County Department of Public Works, October 1976	8
C. Summary of Sonoma County Solid Waste Management Plan, Brown and Caldwell, November 1985	11
D. Summary of Sonoma Solid Waste Management Plan Revision, Preliminary Draft, Brown and Caldwell, April 1989	14
E. Summary of Countywide Integrated Waste Management Plan, EBA Wastechologies, Parametrix et. al, April 1996	15
F. Sonoma County Waste Management Alternatives Analysis Project, Final Report Prepared for: Sonoma County Department of Transportation and Public Works Prepared by: SCS Engineers December 29, 2000	17

G. Summary of Sonoma County Countywide Integrated Waste Management Plan	19
Prepared by: Sonoma County Waste Management Agency	
Prepared for: Jurisdictions of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, Windsor, and the County of Sonoma	
October 15, 2003	
3.2. Disposal Site Ownership and Operations Histories	20
3.3. History of Sonoma County Disposal Rates (chart)	22

Sonoma County Solid Waste System Summary 1940 – 2004

1. Planning, Operation and Management History

Sonoma County first became involved in maintaining refuse disposal sites in 1940. In 1954, the County adopted Ordinance No. 387, which regulated the collection and disposal of garbage. This Ordinance included a provision that any County or City resident could dump refuse originating from their residence at any County-maintained disposal area without charge. This had the indirect effect of establishing the County as the only agency engaged in refuse disposal in Sonoma County. By 1967, the County was operating seven disposal areas (five as “burn dumps”) around the County with no charge for residential/self-haul users and with a cubic yard charge for contract haulers.

In 1967, the County prepared its first Solid Waste Disposal Plan to deal with the limited capacity of some sites as well as the public nuisance and fire hazards associated with burn dumps. This Plan was adopted as an element of the County General Plan in April 1968. It recognized that the County would be responsible for solid waste disposal, and each city would handle, using private haulers, the collection of refuse within their jurisdictions. This Plan considered five disposal alternatives that included various combinations of incineration, transfer stations and landfills. The alternative adopted by the Board included plans for four landfills around the County.

Following adoption of the 1967 Plan and an Ordinance revising the regulation of solid waste in the unincorporated County, the County stopped the open burning operations and, where space permitted, converted the burn dumps into landfills. By 1970, implementation of the 1967 Plan resulted in the purchase and development of new property for landfills in Healdsburg, Annapolis, and for the Central site.

During this period, rapid technical and legislative changes along with increasing concern for environmental protection prompted the preparation of the 1976 County Solid Waste Management Plan (CoSWMP). In developing the CoSWMP, the first Solid Waste Advisory Committee was created with representatives from every city as well as haulers, recyclers, the County, the League of Women Voters, and regulatory agencies. Presentations of the CoSWMP were made at the Mayors and Councilmen's Association and at least two meetings of each City Council. Where the 1967 Plan was primarily an engineering and economic study focusing on disposal techniques, the 1976 CoSWMP was required by state law and spent significant effort on recycling and resource recovery planning.

The 1976 CoSWMP approved by the County included recommendations to replace the landfills in Sonoma, Occidental, and Annapolis with transfer stations. It also recommended to the Board a five-year Refuse Fee Schedule, a system of licensing for refuse haulers in the unincorporated County, and the creation of an Enterprise Fund for refuse operations.

State law required the CoSWMP to be reviewed every three years and revised if necessary. In 1985, the Board of Supervisors and all of the cities considered and adopted the 1985 CoSWMP, which added plans for a composting program to the existing waste diversion and recycling efforts and set locating a new landfill site to replace the Central Landfill as a top priority.

In January 1992, after several years of effort to site a new landfill and a re-evaluation of Central Landfill capacity, the Board directed staff to discontinue this work and to pursue expansion of the Central Landfill instead.

In April 1992, in an effort to better address the new solid waste management requirements imposed by AB 939 (Sher), the Integrated Waste Management Act of 1989, the County and the cities created the Sonoma County Waste Management Agency. This Joint Powers Agency (JPA) was given responsibility for regional programs, including composting, education, and household hazardous waste, with formal representation by all jurisdictions in the County. AB 939 also required a Local Task Force (LTF), to advise the County during preparation of the ColWMP, and the Board of Supervisors renamed the existing Solid Waste Advisory Committee and authorized it to perform this role.

By 1994, the Guerneville, Sonoma, Healdsburg, and Annapolis landfills had been replaced with transfer stations, with all waste delivered to the Central Landfill.

As required by AB 939, Sonoma County developed a Countywide Integrated Waste Management Plan (ColWMP). With its adoption by the County and all the cities and approval by the California Integrated Waste Management Board (CIWMB), Sonoma County became the first county in the state to have a ColWMP. The 1994 ColWMP, in addition to 50% waste diversion goals, included plans to expand the Central Landfill and to begin looking for a new in-County landfill site.

In 1995, the JPA became a Regional Agency for AB 939 compliance and reporting purposes. This designation conveyed all ten jurisdictions' AB 939 requirements to the JPA.

In 1999, the County and the AB 939 Local Task Force reviewed the long-term solid waste disposal element of the 1994 ColWMP, which generated recommendations that the Central Landfill be expanded beyond the limits set in the 1994 ColWMP, to its maximum feasible capacity, establish a refuse flow control policy among the County's jurisdictions and, in the longer term, site a new landfill as well as a solid waste anaerobic digestion facility. The JPA accepted the recommendations and prepared the 2003 ColWMP that included these actions. This 2003 ColWMP was subsequently approved by all the cities.

2. Disposal Costs, Fees and Quantities

The 1967 Preliminary Solid Waste Disposal Plan provides a historical perspective on the cost of operating the County's solid waste disposal system at that time, which reported that during the fiscal year 1965-66, the total cost of refuse disposal was approximately \$137,000, of which \$37,000 was paid by contract haulers, with the remainder covered by the County General Fund. These costs included lease payments, but did not include any capital costs for site acquisition. It was estimated that 135,000 tons of solid waste was disposed in that same period, at a cost to the County of \$1/ton.

Until 1974, free disposal was provided for private citizens hauling loads of less than four cubic yards. The 1976 County Solid Waste Management Plan (1976 CoSWMP) reported that during FY 1973-74 the total cost of refuse disposal was \$829,000, of which \$165,386 was billed to licensed contract haulers. The Board of Supervisors adopted a Refuse Fee Schedule for solid waste disposal in January 1976, with a disposal rate for non-licensed haulers of \$0.65/cubic yard (or \$6.95/ton). The 1976 CoSWMP reported that 189,580 tons of solid waste was disposed into County-controlled sites at that time.

The 1985 CoSWMP reported that 295,200 tons of solid waste was disposed in County sites in 1981, with a total County population of 301,000. In 1983 disposal rates had reached \$1.00/cubic yard for non-licensed haulers.

The draft 1990 revision of the Sonoma County Solid Waste Management Plan indicated that a total of 532,000 tons of solid waste was landfilled in Sonoma County in 1988 with 1989 tipping fees of \$2.00/cubic yard for non-licensed haulers and a County population of 363,000.

Table 1 includes the subsequent history of the disposal rates (tipping fees) and quantity of waste disposed within the County system from 1991 until 2004.

Between 2001 and 2003, in order to comply with AB 939 requirements to increase recycling rates, the County and most cities began implementing single-stream recycling, which dramatically increased recycling and reduced the quantity of waste requiring disposal. The 28% July 2004 tipping fee increase also encouraged private debris box companies and self-haul customers not under control of the County and cities to bypass the County system and go to out-of-County disposal sites in Marin and Napa counties.

Appendix 3.1

Solid Waste System Planning History

3. 1. A. Preliminary Solid Waste Disposal Plan for Sonoma County Prepared by Sonoma County Road Department, Dated 1967

(The following text comes directly from the 1967 Plan)

"In 1954 the County adopted Ordinance 387, which regulated the collection and disposal of garbage and refuse. One of the provisions of this Ordinance provided that any County or City resident could dump at any County-maintained disposal area, without charge, any garbage or refuse originating from his own home. This had the indirect effect of establishing the County as the only agency, public or private, engaged in refuse disposal in Sonoma County." [page 6]

"There are seven operating Disposal Areas owned or leased by the County, and open-pit burning practiced at five of these locations. Currently, no charge is made at the Disposal Areas for individual disposal by Sonoma County residents, but an average charge per yard is levied against contract haulers." [page 6]

"The County is not involved in the collection of garbage or refuse, having assumed the responsibility of disposal only. . . Contract haulers, franchised or non-franchised, deliver between 30% and 40% of the volume received at the County Disposal Areas; the remaining volume is delivered by individuals hauling their own refuse." [page 7]

"The County presently operates seven (7) Refuse Disposal Areas. . . :

"1. Sonoma: The Sonoma Refuse Disposal Area is located on State Highway 116 approximately 9 miles from Petaluma and 5 miles from Sonoma. The site contains 28 acres and is leased at the rate of \$6,000 per year. The lease expires in September 1975. The operation was converted to a sanitary landfill during the fiscal year 1965-66." [page 8]

"2. Roblar: The Roblar Refuse Disposal Area is located on Roblar Road near the intersection of Canfield Road and is approximately 6.5 road miles from Cotati and 7 road miles from Sebastopol. The site contains 78 acres and is leased until September 1981 with 2 five-year options or until September 1991.... The operation was converted to a sanitary landfill during fiscal year 1966-67." [pages 8-9]

"3. Windsor: The Windsor Refuse Disposal Area (currently referred to as the Airport Closed Disposal Site) is located on Slusser Road at the west end of the Sonoma County Airport approximately 8 miles from Santa Rosa, 10 miles from Healdsburg, and 12 miles from Sebastopol. This site contains approximately 20 acres and is part of the Sonoma County Airport property and is County owned. The operation is a combination of landfill (trench method) and open burning." [page 9]

"4. Guerneville: The Guerneville Refuse Disposal Area is located on Pocket Canyon Drive approximately $\frac{3}{4}$ mile from State Highway 116 and approximately 3 miles from Guerneville and $5\frac{1}{2}$ miles from Forestville. This site contains approximately 90 acres and is owned by the County of Sonoma. The operation is continuous burning at this site. With continuous burning, this site can last for an indefinite period. With burning practices curtailed this site can be converted to a sanitary landfill operation with a capacity of approximately 15 years. Although not an ideal location for a landfill

operation, this site can be readily converted with a minimum expense for conversion.”
[page 10]

“5. Healdsburg: The Healdsburg Refuse Disposal Area is located on Alexander Valley Road near the Healdsburg Avenue intersection and is approximately 2½ miles from Healdsburg and 5 miles from Geyserville. The site contains 4 acres and is leased until October 12, 1972, or until terminated by mutual agreement of both parties. Lease payment is \$1,200 per year. The operation is a continuous burning operation....”
[pages 10 and 11]

“6. Occidental: The Occidental Refuse Disposal Area is located on Stoetz Lane approximately ½ mile from the Harrison Grade Road intersection and approximately 3 miles from Occidental and 10 miles from Sebastopol. This site contains approximately 2 acres and is owned by the County of Sonoma. The operation is a continuous burning operation.... This site should now be considered obsolete for practical use due to the size of the site and the extreme fire hazards that are created because of this fact. Adequate clearance cannot be provided as required by California State Law due to the fact that the County has no control over the property surrounding the site. It would appear that the minimum requirements may be met for the year 1967-68 but it is doubtful if requirements may be met in the future. This site cannot be operated without continuous burning and if burning were to be discontinued, this site would have to be closed immediately. Due to these circumstances it would seem imperative that new disposal facilities or other means of disposal for this area be made available at the earliest possible date.” [page 12]

“7. Cloverdale: The Cloverdale Refuse Disposal Area is located on Pine Mountain Road approximately 1½ miles from the Geyser Road intersection and approximately 4 miles from Cloverdale. The site contains approximately 6 acres and is rented at the rate of \$175 per month. The rental agreement may be terminated by either party by 30 days written notice. The operation is a continuous burning operation.... In general, this site is poorly located and should now be considered obsolete for practical use. The site is small and cannot be used for any type of landfill operation and requires continuous burning at all times, creating an extreme fire hazard. Adequate clearance as required by California State Law cannot be provided due to the fact that the County has no control over the surrounding property. Minimum requirements may be met for 1967-68; however, it is extremely doubtful if requirements may be met in the future. This site cannot be operated without continuous burning; if burning were to be discontinued this site would have to be closed immediately....” [page 13]

“In review, the five alternatives which have been investigated are briefly described as follows:

Alternate 1: One central incinerator to serve the Central and Southern Service Areas, with transfer stations handling the Northeastern and Northwestern Service Areas. Costs included haul, transfer, land, and operation of the incinerator sites, but did not include the small landfill which would be needed in conjunction with the incinerator... [page 68]

Alternate 2: Two small incinerators, one located in the Central Service Area, and one located in the Southern Service Area. Transfer stations were considered for use by the Northeastern and Northwestern Service Areas. Costs which were considered were the same items as Alternate 1...” [page 68]

Alternate 3: One central incinerator to serve the Central and South Service Areas, with local landfill sites to serve the Northeastern and Northwestern Service Areas. Costs which were considered were haul, land, and operation of the incinerators and landfills..." [page 68]

Alternate 4: Two small incinerators, one located in the Central Service Area and one located in the Southern Service Area. Landfills were considered for the Northeastern and Northwestern Service Areas. These were the same landfill sites as considered in Alternate 3. Costs which were considered were haul, land, and operation of the incinerators and landfills..." [page 68-69]

Alternate 5: Four landfill sites were chosen, one in each Service Area. Costs which were considered were haul, land, and operation of the sites..." [page 69]

"[T]he least expensive alternative is Alternate 5, the four landfills." [page 70]

**3. 1. B. Solid Waste Management Plan for Sonoma County, California
Prepared by County Department of Public Works, Dated October 1976**

(The following text comes directly from the 1976 CoSWMP)

“Public hearings and inputs were provided during the preparation of the “Preliminary Solid Waste Disposal Plan for Sonoma County,... prepared in 1967, and was adopted as an element of the County General Plan on April 23, 1968.” [p. 1 – 1976 Summary]

“This plan was essentially an engineering and economic feasibility study relative to disposal techniques, and reflected the status of development and land use planning extant in the County in 1967-68.” [page 1 – 1976 Summary]

“Purpose and Scope of the Report

“[The 1976 County Solid Waste Management Plan (1976 CoSWMP) was mandated by] the Nejedly-Z’berg-Dills Solid Waste Management and Resource Recovery Act of 1972. The Act gave birth to the State Solid Waste Management Board, ‘the objective of which will be to manage solid wastes in this state so as to protect public health, safety and well being, to preserve the environment, and to provide for the maximum reutilization and conversion to other uses of the resources contained therein.’ (Government Code, Title 7.3, Section 66702).” [page 4]

“Authorization and Administration

“By resolution adopted July 8, 1974, the Sonoma County Board of Supervisors formed the Sonoma County Solid Waste Advisory Committee for the purpose of reviewing and preparing a comprehensive solid waste management plan, meeting the provisions of the California Administrative Code, Title 14, Division 7, Chapter 2. The Advisory Committee consisted of representatives of the incorporated areas of the county, members of the Sonoma County Scavenger’s Association and various county agencies.

“Invitation was extended to the eight incorporated cities of Sonoma County to nominate representatives to participate on the Advisory Committee. Nominations were received and accepted from the Cities of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, and Sonoma.

“At the request of the Board of Supervisors, the Sonoma County Scavenger’s Association nominated two members of the Advisory Committee, one representative of primarily rural refuse collection and associated resource recovery activities, and a second of primarily urban involvement.

“In order to provide for certain other guidance and experience in areas of refuse collection, storage and disposal, four Sonoma County department heads were invited to participate, being the Director of Public Works, Planning Director, Director of Environmental Health Services, and Chief Engineer of the Sonoma County Water Agency.

"In addition, participation was invited by the Santa Rosa Recycling Center, the League of Women Voters, and the California Regional Water Quality Control Board, North Coast Region. The staff of the State Solid Waste Management Board was consulted during plan preparations.

"Appearances were also made by private persons having an interest, and whose expertise was sought." [page 2]

"The Advisory Committee, under chairmanship of the Director of Public Works, assisted the Department of Public Works in the preparation of this plan by offering critique at several intervals during preparation of the plan.

"During development of the plan several meetings of the Solid Waste Advisory Committee were held, and input was delivered by representatives of the various member agencies.

"In addition, at least two presentations concerning the report and its progress were made to each city council at scheduled meetings. Similar public meetings were hosted by the Board of Supervisors.

"The matter was the topic of a meeting of the Mayors and Councilmen's Association, and coverage was afforded by the local newspapers." [page 3]

"Short-Term [Recommendations] (1976-1980)"

- "2. A transfer station should be constructed to replace the Sonoma Disposal Site, and solid waste should be transferred to the Central Disposal Site for disposal. This project is a County matter, and is contemplated for 1977-78." [page iii]
- "3. A transfer station should be constructed to replace the Occidental Disposal Site, and solid waste should be transferred to the Central Disposal Site for disposal. This County project should be undertaken in 1976." [page iii]
- "4. A transfer station should be considered for installation to replace the Annapolis Disposal Site before 1980. Solid waste should be transferred to the Central Disposal Site for disposal." [page iii]
- "7. Solid waste collection services should be standardized as to service to be performed and fees to be charged in the unincorporated areas, and a system of licensing of refuse haulers should be devised which will provide for availability of the full range of services to those persons choosing to partake." [page iii]

"General (Continuing) and Long Range [Recommendations] (1991-2000)"

- "3. The County and Cities should encourage individuals to reduce their waste generation and promote resource recovery through underwriting or undertaking education activities, and by continuing financial assistance to resource recovery activities." [page i]
- "5. The County and Cities should continuously examine the public policy toward methods of processing and disposal in order to provide for the utilization of resource and energy recovery systems as appropriate, keeping in mind existing investments and environmental protective measures which comprise the existing system and were part

of the implementation of the "Preliminary Solid Waste Disposal Plan for Sonoma County," 1968, which was adopted as part of the County General Plan." [page i)

"10. Refuse disposal should remain a public operation and should be considered for financing as an Enterprise Fund activity." [page ii]

"12. The fees, as shown in Refuse Disposal Fee Schedule, should be adopted and adjusted annually, if appropriate, on July 1 of each year. [page ii]

"13. All disposal fees should be examined annually in order to make necessary adjustments in proportion to the relative average expenses incurred in handling and processing various classes of wastes." [page ii]

3. 1. C. Sonoma County Solid Waste Management Plan
Prepared by Brown and Caldwell, Dated November 1985

(The following text comes directly from the 1985 CoSWMP)

“Plan Requirement

“The State of California requires that every county develop a county solid waste management plan (CoSWMP or Plan). Accordingly, the County prepared and adopted their CoSWMP in 1976. The California Waste Management Board (CWMB) requires each county to review their COSWMP [sic] every 3 years and to revise it if necessary.” [page 1-1]

“In July 1980, the County submitted a plan review report and recommended that the CoSWMP be revised. The CWMB concurred. This document is the 1985 revision of the Sonoma CoSWMP.” [page 1-2]

“Introduction

“Approximately 11 percent of the generated waste materials that are normally landfilled are recycled in the County.” [page 1-1]

“The County owns and operates four landfills and two transfer stations and is building a third transfer station. Collection is performed by private haulers operating under franchise agreements with the cities and County.” [page 1-1]

“Solid Waste Management Issues

“During preparation of this CoSWMP, critical issues were identified that must be resolved during the next 10 years in the County: (1) the need to replace or expand the Healdsburg, Sonoma and Central landfills, and (2) sludge disposal for the City of Santa Rosa.” [page 1-2]

“Healdsburg Landfill

“With its present boundaries, the Healdsburg landfill is expected to reach capacity during 1987....” A decision must be made soon whether it can be expanded to an adjacent County-owned canyon or must be replaced by another site or a transfer station.... Resolution of this situation is a top priority for the DPW.” [page 1-3]

“Sonoma Landfill

“The Sonoma Landfill will reach capacity during 1984. A transfer station is being built to replace that site.” [page 1-4]

“Central Landfill

“If a Healdsburg Transfer Station is build, the Central Landfill is expected to reach capacity by 1994. Without the transfer station, it may last until mid-1995. In either case, a search must begin now for a replacement site. Expansion to a small adjacent canyon owned by the County will extend the capacity only a short time. Since most of the County wastes are disposed of at

the Central Landfill, and since a long lead time is necessary to acquire and develop a new site, locating a new site must be a top priority of the DPW.” [page 1-4]

“Sludge Disposal

“The Santa Rosa Regional Sanitation Plant’s sludge storage ponds are nearly full, and city staff is investigating methods of sludge disposal.” [page 1-4]

“Other Planning Issues

“Reduction of waste disposed in landfills is another high priority of the County... “Maintaining environmental quality and ensuring an economical solid waste management system are two other high priorities....” [page 1-6]

“Recommended Plan

“...The [recommended] composting plant located at the Central Landfill, is for plant debris only. Additionally, studies of sludge and manure composting and landfill gas recovery should be encouraged or implemented by the County as appropriate.” [page 1-6]

“Plan Approval

“The approval process is outlined in the California Administrative Code, Title 14, Chapter 2, Sections 17147 and 14150. According to the code, a preliminary draft of the plan revision must be submitted to the County Board of Supervisors, cities, and CWMB for review and comments. Following the review and comment period, a final draft plan is prepared and submitted to the same agencies. Public hearings or meetings must be held by the County Board of Supervisors and each city council prior to adoption or approval of the plan revision. The CoSWMP revision must be approved by a majority of the cities in the County which contain a majority of the population of the incorporated area of the County.” [page 1-7]

“After approval by the cities and County, the plan must be submitted to the CWMB, which must approve the revision or request modifications and resubmittal of the revision.” [page 1-7]

“Two solid waste management system alternatives appear most appropriate after combining these technologies:

1. Continue the County’s landfill and transfer station program as needs arise and fund a countywide solid waste public information program;
2. ...add a garden waste composting operation.” [page 5-4]

“Landfills:

“The Annapolis and Central Landfills will continue to receive wastes until they reach capacity. At that time, the Central Landfill will be expanded or replaced by a new landfill. Annapolis Landfill may be expanded or replaced by a new landfill or a transfer station.... Action should be taken immediately to start location of a replacement site for the Central Site and to determine the future of the Healdsburg Landfill regarding (1) the complaints of environmental

problems; (2) feasibility of expanding into the adjacent canyon; and (3) site closure and construction of a transfer station.” [page 5-14]

“Transfer Stations:

“The Guerneville Transfer Station is operating and the Sonoma Transfer Station is being built. The Occidental Transfer Station will continue to operate. If the Healdsburg Landfill must be closed, a transfer station may be necessary to replace the landfill.... Depending on the replacement of the Central Landfill when it reaches capacity, one or more transfer stations may be necessary in the Central service area. The Annapolis Landfill may be replaced by a transfer station.” [page 5-14 to 5-15]

“Composting Operation:

“The primary site alternative is the current Central Landfill although other sites should be considered.” [page 5-15]

“Solid Waste Information Program

“A solid waste public information program will be instituted by the County. This program will educate and inform the public about available programs and methods for reducing wastes going to landfills by recycling, reuse, and waste reduction. Publicizing the composting program and educating people about litter abatement are also included.” [page 5-15]

“Programs for Further Study

“Landfill gas recovery and composting of sewage sludge and manure should be studied as resource recovery options and disposal options (for composting). As the search for replacement landfill sites continues and as energy prices change, energy recovery alternatives should be investigated as means to reduce landfill capacity requirements.” [page 5-15 to 5-16]

“As indicated above, the County can increase rates in 1985 to meet the demands of its refuse disposal capital improvement program, and still have fees which are less than the average of those (in some cases, the comparison rates were adopted 2 or 3 years ago) being assessed by surrounding communities. It can be concluded, therefore, that the proposed short-term refuse disposal program is economically feasible.” [page 6-8]

**3. 1. D. County of Sonoma Solid Waste Management Plan Revision
Preliminary Draft Prepared by Brown and Caldwell, Dated April 1989**

(The following text comes directly from the 1989 CoSWMP)

“As the 1990 revision of the Sonoma County Solid Waste Management Plan (Plan), this document describes the updated status of waste management practices in the County.” [page 1-1]

“In July 1980, Sonoma County submitted a plan review report recommending the Plan be revised, which was subsequently done and approved by the CWMB on April 11, 1986. This is the second revision to the Plan. A Plan review report was submitted on April 11, 1989, recommending this second revision.” [page 1-1 to 1-2]

“Key Issues

“Two key issues present themselves as being most significant in this Plan. These are the siting of a disposal site to replace the Central Disposal Site, which will close in 1993-1994, and the programs necessary for achieving a 20 percent recycling goal in the short term.” [page 1-4]

“Evaluating and proposing potential programs for meeting the goal of 20 percent recycling in the short term is the major issue addressed by this Plan.” [page 1-5]

[NOTE: This CoSWMP revision was never completed, as AB 939 was approved, which eliminated this Plan requirement and replaced it with a requirement for a Countywide Integrated Waste Management Plan.]

3. 1. E. County-Wide Integrated Waste Management Plan
Prepared by EBA Wastechologies, Parametrix, et al, Dated April 1996

(The following text comes directly from the 1996 Plan)

“With the enactment of Assembly Bill 939 in 1989, the State of California has required each city and county to prepare solid waste management planning documents that will demonstrate how each jurisdiction will reduce the amount of waste that is sent to landfills by 25 percent by 1995 and 50 percent by the year 2000. These planning documents are known as Source Reduction and Recycling Elements (SRREs) and Household Hazardous Waste Elements (HHWEs). In addition to these documents, each county is required to develop a County Integrated Waste Management Plan (CIWMP) and Siting Element that will demonstrate long-term ability to ensure the implementation of countywide diversion programs and provide adequate disposal capacity for local jurisdictions through the siting of disposal and transformation facilities. Assembly Bill 3001 (Cortese, 1992) later created the Nondisposal Facility Elements (NDFEs) to address the siting of all facilities other than disposal and transformation facilities such as transfer stations, material recovery facilities, and composting facilities.” [page 1-1]

“The County will plan and implement programs to satisfy the county’s solid waste management needs for the next fifty years in a manner that is cost-effective and is operated to follow the State of California’s solid waste management hierarchy. The hierarchy consists of waste prevention (source reduction), reuse, recycling, composting, and disposal. Additionally, the solid waste management system for the county shall protect public health, safety, and well being; preserve the environment; and provide for the maximum feasible conservation of natural resources and energy.” [page 1-1]

“This IWMP, and the SRREs and HHWEs that are part of it, are intended to achieve a significant diversion of waste from landfilling.” [page 1-3]

“Siting Element

“Pursuant to the proposed Article 5, Section 18755 through 18756.7 of the California Code of Regulations, Division 7, Appendix C, the Sonoma County Siting Element presents an integrated strategy to ensure the provision of long-term disposal capacity in the county. The County demonstrates its ability to provide 15 years of combined permitted disposal capacity from the submission date (1994) of this document.” [Appendix, page C-1]

“The County will site necessary environmentally safe disposal capacity for municipal solid waste generated within the county for the long-term (50 years).” [Appendix, page C-2]

“2.1 Existing Countywide Disposal Capacity

“During the same period that the Source Reduction and Recycling Elements (SRREs) were being prepared, the DPW authorized an independent engineering study to redefine the configuration of the Central Landfill and provide updated estimates of remaining disposal capacity at the site.” [Appendix, page C-4]

“The 1992 Study concluded that as of January 1992, remaining Central Landfill capacity was 11.5 million cubic yards.” [Appendix, page C-4]

“Based upon projections contained in the 1992 Study, Sonoma County has sufficient landfill capacity through the short- and medium-term planning periods without changing the existing configuration of the site.” [Appendix, page C-4]

“2.2 Anticipated Countywide Disposal Capacity Needs

“Given the site life projections presented above, the County’s basic strategy of providing at least 15 years of disposal capacity from submission of this document in 1994 will require the expansion of existing, and/or the development of new disposal capacity. There are also other possible options. The County has defined six basic expansion options for the Central Landfill. The six expansion scenarios are:

- Lateral expansion into an area know as East Canyon
- Lateral expansion into both the East Canyon and an adjacent parcel know as West Canyon
- Lateral and vertical expansion from a maximum height of 565 feet mean sea level to approximately 720 feet mean sea level and expansion into an area known as East Canyon
- Lateral and vertical expansion from a maximum height of 565 feet mean sea level to approximately 720 feet mean sea level in both the East and West Canyons
- Lateral expansion into both the East and West Canyons with the relocation of existing onsite facilities
- Lateral and vertical expansion from a maximum height of 565 feet mean sea level to approximately 720 feet mean sea level in both the East and West Canyons, and relocation of existing onsite facilities.” [Appendix, page C-5]

“Projected closure dates for the Central Landfill under each expansion scenario are:

- Base Case, No Expansion, 2004
- East Canyon Expansion, 2010
- East and West Canyon Expansion, 2012
- East and West Canyon Expansion with Relocation of Existing Facilities, 2014
- East Canyon Expansion and Raised Fill Height, 2018
- East and West Canyon Expansion and Raised Fill Height, 2023
- East and West Canyon Expansion with Raised Fill Height and Relocation of Existing Facilities, 2028

“Any of the potential expansion scenarios, as well as siting a new landfill, would provide disposal capacity sufficient to last through the year 2009 (15 years beyond 1994). It is the County’s intent that this additional capacity be permitted and developed prior to the exhaustion of current disposal capacity.” [Appendix, page C-6]

3. 1. F. Sonoma County Solid Waste Management Alternatives Analysis Project Final Report Prepared by SCS Engineers, Dated December 29, 2000

(The following text comes directly from the 2000 Alternatives Analysis)

Excerpts from “SCS Engineers (SCS) was retained by the Sonoma County Department of Transportation and Public Works to define and evaluate options for the County’s Solid Waste Management System for the years 2015 through 2050.” [page E-1]

“From its inception through completion, the Solid Waste Management Alternatives Analysis Project was a collaborative process between the Department of Transportation and Public Works and the Sonoma County AB 939 Local Task Force (LTF). The monthly LTF meetings provided the forum for review and discussion of project data, and a consensus was sought for each milestone decision. The public was informed of the project through mailings and announcements at City Council meetings. A special evening meeting of the LTF was held in September 2000 to present the prospective management scenarios to the public.” [page E-1]

“At the conclusion of the 13-month project, the LTF reached a consensus on a strategy to meet Sonoma County’s solid waste management goals and needs for the planning period 2015 to 2050. The strategy consists of the following four key elements:

1. Formal agreement among all cities and the County to direct flow of refuse and green waste to a new integrated resource management facility.
2. Mandatory source separation of recyclables from waste for residential, commercial, industrial, and institutional waste generators.
3. Expansion of Central Landfill beyond its current permitted capacity.
4. Siting of an integrated resource management facility to include organics processing (anaerobic digestion or biorefining), green waste composting, and landfilling.” [page E-1 to E-2]

“SCENARIO EVALUATION PROCESS

“The final stage of the analysis involved evaluation of the nine scenarios for relative risk (technological, environmental, and economic), cost per ton, impacts on diversion and disposal quantities, local control, and resource efficiency. The objective was to narrow down the selection to three preferred scenarios. This element of the process involved a vote by the LTF members, and each member selected three top scenarios. The process resulted in three scenarios receiving a majority of the votes, with the remaining scenarios each receiving two or less votes.

“The three scenarios all contained flow control policy and organics processing technologies, and eliminated the option to send waste out of the County. The decision to not send wastes out of the County for disposal emphasized the commitment to be responsible for the wastes generated/disposed in the County. The scenarios differed in terms of requirements for processing all waste versus mandatory source separation of recyclables, which emphasizes generator responsibility versus reliance on technologies for diversion. There were also differences in the selection of expanding Central Landfill versus development of a new in-county landfill. This again reemphasizes the County’s commitment to final disposition of the

waste, but indicated some differences in whether the disposal should be at the existing site, or a new location.

“SELECTION OF PREFERRED SCENARIO

“Following the selection of the three final scenarios, the LTF was tasked with identifying the preferred scenario to be recommended to the County Board of Supervisors (BOS). On October 12, 2000, the LTF reached a consensus on a strategy to meet Sonoma County’s solid waste management goals and needs for the planning period 2015 to 2050. The key elements of the strategy consist of policies to direct the flow and separation of the wastes; expansion of the existing landfill to provide short to medium-term disposal capacity; and siting and development of a new facility that will combine in (potentially) one location the existing green waste composting operation, a new organics processing facility, and a new landfill for long-term disposal needs.” [page E-5 to E-6]

**3. 1. G. Sonoma County Countywide Integrated Waste Management Plan
Prepared by the Sonoma County Waste Management Agency for the
Jurisdictions of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park,
Santa Rosa, Sebastopol, Sonoma, Windsor, and the County of Sonoma,
Dated October 15, 2003**

(The following text comes directly from the 2003 CoIWMP)

“6.5 Proposed Solid Waste Facilities

“With further expansion, disposal capacity at the existing Central Landfill is available to last at least through the end of the medium-term planning period, 2018, assuming full implementation of all selected diversion programs. Therefore, Sonoma County’s immediate disposal capacity strategy to achieve the goals and objectives is the expansion of the Central Landfill and subsequently identifying another disposal site as recommended by the Analysis.” [page 6-17]

“The County has established a goal of identifying and developing 50 years of landfill capacity. Following the completion of the 2003 CoIWMP, and once additional capacity at the Central Landfill is permitted, the County plans to begin a Siting Study to identify possible new disposal sites. The public’s input into the Siting Study is expected to be instrumental in applying the siting criteria, evaluating the options for providing 50-years’ capacity, evaluating economic considerations of each option, and identifying key issues that need to be resolved. Several public workshops will be conducted to facilitate receiving input from the public prior to the hearings. The goal of the Siting Study would be to produce a list of sites from which the Board of Supervisors may choose one or more landfill sites. Prior to approval of any new or expanded disposal site, the County will conduct all analyses necessary under CEQA to evaluate the potential significant environmental impacts of the County’s options, including consideration of alternative sites.” [page 6-18]

Appendix 3.2 Disposal Site Ownership and Operations Histories

Airport Disposal Site

The Airport Disposal Site, 60+/- acres, was opened in 1950. Sonoma County operated the site from 1950 to 1967 as an open burn pit. From 1967 to 1971 the site was operated as a sanitary landfill, using a trench fill mode of operation. Waste disposal operations ceased at the Airport Disposal Site in 1971. From 1975 to 1981 the Santa Rosa Rod and Gun Club leased the Airport Disposal Site for target practice. Since 1981 the County has periodically added soil in low spots and graded it to drain better.

Annapolis Disposal Site

The County acquired 40+/- acres from the Molalla Forest Products Corp. in April 1969 to be used as a sanitary landfill site for solid waste from the northwest portions of the County. About 9 acres of the site was used for a landfill until 1994, when a transfer station was built adjacent to the landfill and the landfill was closed.

Central Disposal Site

The County acquired 395+/- acres from Louis Stefenoni in December 1970 to be used as a sanitary landfill site to provide waste disposal capacity for the central and southern portions of the County. Prior use was primarily grazing.

Guerneville Disposal Site

The County of Sonoma purchased approximately 37 acres of the property, an existing disposal site, from the Dangelo family in 1954 as a refuse disposal area in the Guerneville area. An additional 50+/- acres of land and right-of-way to the property were acquired from the Redwood Empire Savings and Loan Association in 1966. In 1970 the burning operations were halted and the site was operated as a landfill. The County established a transfer station at the site and closed the landfill on January 9, 1984. Land adjacent to the landfill has been operated as a transfer station since that time.

Healdsburg Disposal Site

In October, 1954, the Board authorized the lease-purchase of 4.7 acres of an existing burn dump, which had been in operation since approximately 1930 from Victor and Maybelle Maksenti. On October 30, 1968, the Planning Commission recommended to the Board of Supervisors that the 121 acres adjacent to this dumping site off Alexander Valley Road be acquired for dumping purposes. The Board of Supervisors, on December 23, 1968, accepted and approved the Planning Commission Report and authorized the purchase of the 121 acres in 5 stages with the first parcel being purchased at once. In addition, on March 17, 1969, the Board authorized the purchase of the existing dump site. The disposal of refuse in this new area began during the month of October 1971 and was operated as a landfill until 1989. The landfill ceased waste disposal operations in August 1989, when a transfer station was opened at the site.

Occidental Disposal Site

For a period of time prior to November 1942, the Occidental Recreation District owned the property. In November 1942, one-half interest in the approximately 2.53 acre parcel of land was conveyed to the Camp Meeker Public Recreation District for the purposes of jointly operating a public dumping ground. In May 1945, the County of Sonoma purchased a one-half interest in the property for the sum of \$10 from the recreation districts for use as a public garbage dump. Prior to 1972, the Occidental Landfill was operated as an open burning site. Burning operations were originally conducted by one or both of the recreation districts from approximately the mid-1930's until sale of the property to the County in 1945, and then by the County until 1972. After cessation of burning operations, the site was operated as a landfill with refuse being placed in the area of the existing closed landfill. In 1977 the County closed the landfill and established a transfer station at the site until its closure in January 2005.

Roblar Disposal Site

William and Alice Steinbeck owned the Roblar Disposal Site (RDS) from 1956 until November 1964 when it was purchased by Douglas and Christopher Clegg and William Towne who owned the property until March 1965. Elmer and Anna Scott purchased the property in March 1965 and owned it until March 1999 when they sold it to the County of Sonoma Department of Transportation and Public Works. The County operated the site from November 1956 until July 1971. The site was operated from 1956 through 1967 as an open burn pit. Between 1967 and 1971, the site was operated as a sanitary landfill. During the time the site was operated as both a burn dump and a sanitary landfill (1967 to 1971), the site received primarily residential and commercial waste, along with minor agricultural waste. Liquid waste was not accepted for disposal at the site. The City of Santa Rosa re-opened the landfill in 1972 and operated the site from March 1972 through October 1973. Under the direction of the City, demolition debris was disposed of along the top of the lowest waste disposal unit, which was, in turn, covered with soil. The City terminated operations in October 1973, and the landfill has remained inactive since that time, with necessary on-going maintenance provided by the County.

Sonoma Disposal Site

The County of Sonoma operated the site from 1952 to the present. Various members of the Cabral family owned the site between 1952 and 1979. Between 1979 and 1983 the site was owned by both the Cabrals and the County of Sonoma Department of Public Works. The County of Sonoma has owned the site since 1983. From 1952 to 1965, the site was operated as an open pit-burning dump. The California Division of Forestry regulated operations, and their permit allowed for cut, fill, and cover; accumulate and burn; and burn continuously while dumping. The ash from burning remained on site. In 1965, the site was converted to a sanitary landfill. During operation as a sanitary landfill, waste was dumped in the pit and moved to the working face where it was compacted and then covered with dirt. The landfill stopped receiving waste on April 8, 1985, when the site was officially closed to placement of refuse and the Sonoma Transfer Station opened.

Appendix 3.3

History of Sonoma County Disposal Rates				
1976	0.50		0.44	
1978	0.65		0.41	
1979	0.70		0.40	
1980	1.50		0.75	
1982	1.65		0.75	
1983	2.95		1.00	
1985	3.25		1.10	
1986	3.45		1.10	
1987	3.75		1.25	
1988	4.10		1.50	
1989	5.30		2.00	
1990	6.60		2.60	
1991	8.40		3.30	
1992	9.25	23.50	3.63	
1993	9.90	25.15	3.90	26.00
1994	10.60	27.00	4.50	27.75
1995	12.55	32.00	5.35	33.00
1996	12.95	33.00	5.50	34.00
1997	13.75	35.00	5.75	36.00
1998	14.40	36.60	6.00	37.60
1999	15.70	40.00	6.55	41.00
2000	17.30	44.10	7.25	45.20
2001	18.40	46.75	7.75	48.00
2002	19.25	48.65	8.00	50.00
2003	20.20	51.10	8.40	52.50
2004, Jan.	21.50	54.40	9.00	55.90
2004, July	27.30	70.00	11.40	71.00
*Rates in dollars				

APPENDIX B

County and Landfill Survey

Survey of Counties and Landfills

Introduction

This section describes the survey conducted for Sonoma County in October 2004 of sixteen California counties (one in Oregon) and eleven landfills. The purpose of the survey was to understand how similar counties throughout California were handling management of their solid waste to ascertain if any policies, procedures, or ideas could be used to assist Sonoma County in their solid waste management. The county survey included review of each county's institutional arrangements and responsibilities for solid waste management. In addition, the survey looked more in-depth at four nearby counties as potential partners in disposal options. These included Del Norte, Humboldt, Mendocino, and Napa counties. Finally, eleven landfills were surveyed for potential export of Sonoma County's waste. A summary of each aspect of the analysis is included below.

County Institutional Survey

BVA compiled information regarding institutional approaches to solid waste management for sixteen California and Oregon counties. Key issues addressed in the survey include:

1. Type of Organization:

- a) Is there a county "system" of facilities?
- b) Is the entity a joint powers agency (JPA) or district?
- c) What is the scope of responsibilities of the joint powers agency or district?
- d) Does membership include all, or only a portion of the jurisdictions in the county?

2. Public/Private Sector Roles:

- a) What are the public and private sector roles in day-to-day management of the county system?
- b) What is the scope of responsibilities of the joint powers agency or district?
- c) What are the public and private sector roles in facility operation?

3. Flow Control:

- a) Are the members of the joint powers agency or district bound to provide flow control as a provision of the joint agreement?
- b) Does the county have bilateral flow control agreements with individual jurisdictions?
- c) Do the agreements between individual jurisdictions and their haulers provide flow control?

We sought to include a set of jurisdictions for the survey that provide a full range of approaches to the above questions so that County staff can further explore specific



examples. The information contained in the survey is intended as background information and is used for the Alternative Analysis, and in developing the Scenarios.

The survey concluded that institutional approaches vary widely between counties. No single approach is strongly favored. About half of the 16 counties surveyed operate a “system of facilities.” All but three of the counties belong to a JPA or district. These public agencies manage solid waste system activities in all but one of the counties surveyed. While ownership of facilities was somewhat split between the counties surveyed, operations tended to be handled more by the private sector. Flow control was implemented within the JPAs in about 1/3 of those counties surveyed. In almost every county some level of flow control existed between haulers and the jurisdictions they served.

The survey of Lane County Oregon yielded an approach that may be beneficial to the County in collecting revenues to cover closure and post-closure landfill costs through other means outside of disposal tipping fees. Lane County faced a serious and growing operating deficit since all system costs were collected through the system tip fee. With about one-third of the waste stream leaving Lane County, a "system benefit charge" (SBC) was implemented to fully fund County programs and provide a form of economic flow control. The SBC was implemented by county ordinance and stipulates a per-ton surcharge that is charged as part of the system fee at county facilities, and that must be remitted by all haulers collecting waste in-county (through collection rates) that do not use the county system. The ordinance does not prohibit waste export (which would likely be subject to successful legal challenge) but rather is based on the premise that certain system costs should be borne by all generators in the county, regardless of where waste is disposed.

Nearby Counties as Potential Partners

BVA staff surveyed senior waste management staff for four nearby counties: Del Norte, Humboldt, Mendocino and Napa. All four counties export most or all of their waste streams requiring disposal. In summary, the opportunities for direct cooperation are probably limited. Del Norte County has a long-term disposal contract. Staff of Humboldt and Mendocino counties would be potentially interested in participating in joint contracting for disposal, although due to relative tonnages, Humboldt and Mendocino counties are more likely than Sonoma County to benefit from any economies of scale because of their smaller waste generation amounts. In general, the nearby counties would consider partnering with Sonoma, if someone were to build and operate a landfill that would cost less than their current option. The information contained in the survey is intended as background information and is used for the Alternative Analysis (especially Alternative 8), and in developing the Scenarios.

Survey of Landfills for Export of Solid Waste

BVA surveyed information for eleven Northern California landfills, including nine private and two publicly-owned facilities. The survey included information wherever possible on recent negotiated municipal disposal arrangements. The survey information indicated that a cost in the approximate range of \$35 to \$40 per ton, reflecting a combination of County transfer

cost, transport costs depending on roundtrip distances, and negotiated disposal fees could be obtained.

County Institutional Survey

A survey was conducted to gather information regarding institutional arrangements and responsibilities for solid waste management in a variety of other California counties and one Oregon County. Table 1 focuses on Northern California, and includes other California counties (and the Oregon county) that provide useful illustration of approaches to specific institutional issues, and a group of counties that Sonoma County uses for certain (non-solid waste) comparisons due to comparable demographics. Sonoma County's comparable group of counties includes Alameda, Contra Costa, Marin, Monterey, Sacramento, Santa Barbara, Santa Cruz, and Solano. Del Norte, Humboldt, Mendocino, and Napa Counties are the subject of more detailed discussion in the "Possible Partners" section below.

BVA staff compiled information for Table 1 from a variety of sources including current and prior contractual engagements, material collected by Sonoma County staff, County and CIWMB Web sites, and calls to County and Joint Power Agency (JPA) staffs. As part of the survey process, BVA also collected financial information that will be used in later stages of the project for analysis of the alternatives, the economics, and the financial plan.

Table 1 | County Institutional Survey

County	Organization		Public/Private Sector Roles			Flow Control Mechanism		
	County System	JPA/District	Management Responsibility	Ownership	Operation	County/JPA (Part of JPA agreement)	Bilateral (County/JPA with cities)	Hauler (cities with haulers)
Alameda	No	Alameda County Waste Management Authority	Public	Private	Private	No	No	Yes
Contra Costa	No	Central Contra Costa Solid Waste Management Authority West Contra Costa Integrated Waste Management Authority	Public	Private	Private	Yes, for both	No	Yes
Del Norte	No	Del Norte Solid Waste Management Authority	Public	Public	Private (major transfer station), public	No	No	Yes

Survey of Counties and Landfills

County	Organization		Public/Private Sector Roles			Flow Control Mechanism		
	County System	JPA/District	Management Responsibility	Ownership	Operation	County/JPA (Part of JPA agreement)	Bilateral (County/JPA with cities)	Hauler (cities with haulers)
					(smaller drop-off sites and transfer stations)			
Humboldt	No	Humboldt Waste Management Authority	Public	Public	Private (but negotiating buyout to switch to public operation)	Yes	No	Yes
Marin	No	Marin County Solid Waste Authority	Public	Private	Private	No	No	Yes
Mendocino	Yes	Mendocino County Solid Waste Authority	Public	Private	Private (except for smaller drop-off	No	No	Yes



County	Organization		Public/Private Sector Roles			Flow Control Mechanism		
	County System	JPA/District	Management Responsibility	Ownership	Operation	County/JPA (Part of JPA agreement)	Bilateral (County/JPA with cities)	Hauler (cities with haulers)
					sites and transfer stations)			
Monterey	No	Monterey Regional Waste Management District Salinas Valley Solid Waste Authority	Public	Public	Public and Private	Yes	No	Yes
Napa	No	Napa-Vallejo Waste Management Authority Upper Valley Solid Waste Management District	Public	Public (Authority) and Private (District)	Private	Yes	No	Yes

Survey of Counties and Landfills

County	Organization		Public/Private Sector Roles			Flow Control Mechanism		
	County System	JPA/District	Management Responsibility	Ownership	Operation	County/JPA (Part of JPA agreement)	Bilateral (County/JPA with cities)	Hauler (cities with haulers)
Riverside	Yes	Riverside County Waste Management District (now disbanded)	Public	Private (landfills and major transfer stations), public (landfills and smaller transfer stations)	Private (landfills and major transfer stations), public (landfills and smaller transfer stations)	No	No	Yes
Sacramento	Yes	Sacramento Solid Waste Authority	Public	Public and Private	Public and Private	No	No	No
San Bernardino	Yes	Mojave Desert Integrated Waste Management Authority	Public	Public (landfills and unincorporated area transfer stations) and private (transfer stations)	Private	No	Yes	Yes



County	Organization		Public/Private Sector Roles			Flow Control Mechanism		
	County System	JPA/District	Management Responsibility	Ownership	Operation	County/JPA (Part of JPA agreement)	Bilateral (County/JPA with cities)	Hauler (cities with haulers)
San Diego	No	Mid-County Solid Waste Authority	Private	Private	Private	No	No	Yes
Santa Barbara	Yes	No (discussions in process)	Public	Public	Public and private	No	No	Yes
Santa Cruz	Yes	No	Public	Public	Public	No	No	Yes
Solano	No	Napa-Vallejo Waste Management Authority	Public	Private	Private	Yes (for Authority)	No	Yes
Lane (Oregon)	Yes	No	Public	Public and Private	Public and Private	No	No	Yes

Alameda County: The Alameda County Waste Management Authority's primary role is development of diversion programs. The Authority's joint agency, the Source Reduction and Recycling Board, oversees implementation of Measure D, requiring 75 percent diversion by 2010. The Authority has a relatively minor oversight role regarding private facility management, most notably funding incentives for additional diversion of C&D materials and commercial recyclables at Waste Management's Davis Street Recycling and Transfer Station. The Authority owns 1,000 acres of undeveloped land held in reserve for publicly owned landfill capacity, and is in process of negotiating sponsorship of, and conducting environmental review for a privately owned and operated composting facility that would take a broad range of organics. All collection and disposal contracting is done by the individual cities and the county for the unincorporated area.

Contra Costa County: The County has two JPA's that each includes city and county membership. The principal facilities used by each JPA are privately-owned and operated with contractual flow control at the point of collection, transfer, and processing. Both JPA's manage diversion programs for their membership. The Central Contra Costa Solid Waste Authority contracts for collection and disposal for its membership, and Pacific Rim Recycling of Benicia (Solano County) is now developing added capacity to process single-stream recycling from a portion of that Authority's service area. The Central Contra Costa JPA uses Allied's Keller Canyon Landfill. The West County JPA had used a local landfill that is now closing and will be transferring waste to Republic's Potrero Hills.

Del Norte County: See detailed write-up below.

Humboldt County: See detailed write-up below.

Marin County: The solid waste facility system is privately owned and operated. The Solid Waste Authority develops diversion education programs, and provides countywide diversion reporting for the state. The Authority is funded by a tip fee surcharge that is also paid through collection rates by any hauler leaving the county. There is one group of cities, led by San Rafael that have separate collection contracts with the same collectors, but conduct joint rate reviews. Marin Sanitary Services processing facility is known for its pioneering leadership role in diversion. Many of the cities use Waste Management's Redwood Landfill, while several use Potrero Hills via transfer through the West Contra Costa Integrated Resource Recovery Facility. The West Contra Costa Integrated Resource Recovery Facility is owned by Republic and operated under contract to the West Contra Costa Integrated Waste Management Authority.

Mendocino County: See detailed write-up below.

Monterey County: The District covers the coastal area of the County, owns and operates the Monterey Regional Landfill, and contracts for private collection on behalf of its member agencies. The District operates award-winning diversion programs at the MRF located at the landfill. The Authority owns two landfills that are operated privately under contract and upon pending termination of an agreement for Waste Management ownership and operation, the principal transfer station, will also own that facility and contract for its operation. The Authority's members contract individually for collection services. The Authority also has



responsibility for long-term closure/post-closure of several landfills that were formerly County-owned. Upon the formation of the Salinas Valley Solid Waste Authority, ownership and responsibility for two old pre-Subtitle D landfill sites stayed with Monterey County. Ownership and responsibility for four County landfills were transferred to the Authority. The general language for the transfer is contained in the JPA agreement while the specifics are in a property transfer agreement (one of the closing documents for the transfer). Of the four landfills, one was already mothballed and is now closed (subsequent to the transfer) and one accepted waste for just a few years and is closing. As a note, there is some disagreement about transfer of liability in the two documents. The JPA agreement states that the Authority assumes liability upon the date of transfer and going forward, and that implies that liability for past use remains with the County. The transfer document, however, indicates that the Authority is responsible for any remediation. The County is 2 of 9 votes on the JPA.

Napa County: See detailed write-up below.

Riverside County: The County has a combination of publicly and privately owned and operated landfills. The County operates the gatehouse and sets the tip fee at the private landfill. The principal transfer stations are privately owned and operated and the District was formed to purchase them. The County owns and operates several small scale transfer stations. The decision was then made to privatize the transfer system, but keep most landfill ownership public and the District was disbanded. The District was disbanded once it was determined that there was no need to fund the purchase/development of transfer stations.

Sacramento County: The City of Sacramento and the County are members of the Solid Waste Authority. The County owns and operates the Keifer Landfill, a major facility that is potentially available for imports. Most other solid waste facilities are privately owned and operated. A substantial portion of the waste stream is exported to Forward Landfill (collected by Allied) or to Lockwood Landfill in Nevada (transferred from the privately owned and operated BLT Transfer Station) The City and the County both conduct some municipal collection.

San Bernardino County: The County owns a system of transfer stations and landfills and currently contracts all operations to Burrtec Waste, Inc. In 1995, the County contracted with Norcal for the privatization of management of the solid waste system and the operation of all County facilities. This agreement was dissolved in 2001 following indictments of several senior County officials on corruption charges. The County directs waste to County transfer stations and landfills through bilateral waste delivery agreements between the County and individual cities. The County began negotiating the agreements in recent years as a means of reducing loss of waste. The JPA, of which the County is a member, serves a small portion of the northern area of the County, allowing for joint use of a private transfer station.

San Diego County: In the late 1990's San Diego County became the only California County to completely privatize a formerly publicly-owned facility system. The County received \$170 million for sale of the system to Allied. The County had developed the North County Resource Recovery Facility (NCRRF) waste-to-energy facility with contractual put-or-pay tonnage obligations tied to facility financing, but did not have the flow control necessary to

bring the required tonnage. In some cases, in which the County did have flow control, hauling distances proved uneconomic. The County closed the facility and sold the County system (two large, one medium, and one small sized landfill; one transfer station; 11 container sites; and the NCRRF) as a means of financing the debt. There have been significant concerns that Allied would have monopoly control of facility pricing, but rates have remained stable because the City of San Diego continues to own and operate a major landfill that accepts waste from other jurisdictions in the County. A five city JPA in the middle of the County owns a transfer station that is privately operated and contracts for disposal of waste in Orange County.

Santa Barbara County: The County owns and operates a system of two existing transfer stations, two pending transfer stations (in the process of development at closed County landfill sites) and one major landfill (the Tajiguas Landfill). The landfill serves the populous southern portion of the County; some northern County waste is exported to a private landfill in San Luis Obispo County. In the unincorporated areas the County offers "high density" and "low density" service that is the same service package but at higher rates for the more rural areas. In 2003, the County implemented a mandatory commercial and multi-family dwelling recycling program in the unincorporated areas. In June 2001, the County and the cities created the Multi-Jurisdictional Solid Waste Task Group that has much of the appearance of a joint powers authority. The Group's charge is to "provide a forum to discuss and plan countywide long-term solid waste management strategies and facilities." The Group has met on a continuous basis, developed a "Long-Term Solid Waste Management Plan" that addresses facilities and programs on the basis of three geographic wastesheds, and addressed a range of diversion issues including C&D recycling, organics programs for food scraps, and MSW conversion technologies. The members are elected officials and the Group has a technical advisory committee with a range of public agency staff.

Santa Cruz County: The County owns and operates one transfer station and one landfill serving primarily the southern portion of the County. Due to geography, proximity to other landfills, and relative tip fees, the County's Buena Vista Landfill is used by Scotts Valley (Waste Management collects) even in the absence of flow control. Buena Vista is scheduled to close in 2019 and the County has conducted a landfill siting study and identified potential sites for a new landfill within the County. The County is also considering export of waste to Monterey County. Of the northern cities in the County, one exports waste to the Marina Regional Landfill in Monterey County, and two operate municipal landfills of their own.

Solano County: Vallejo is the largest member of the Napa-Vallejo Waste Management Authority. Solano County's solid waste system is primarily privately-owned and operated and the County is home to two major private landfills - Republic Service's Potrero Hills and Norcal's Hay Road. Jurisdictions generally contract individually for collection and disposal.

Lane County, Oregon: The County owns and operates a system of rural container sites, transfer stations, and a central landfill. Until the late 1990's, nearly all waste generated in the County went through the County system, even in the absence of any contractual flow



control. In 1998, growing amounts of solid waste began to be exported by private haulers to a private out-of-County landfill. Lane County faced a serious and growing operating deficit since all system costs were collected through the system tip fee. By early 1999 about one-third of the waste stream was leaving the County. BVA assisted the County in developing a "system benefit charge" (SBC) that serves to fully fund County programs and provides a form of economic flow control. The County planned to later seek to supplement the SBC with contractual flow control. The SBC was implemented by County ordinance and stipulates a per-ton surcharge that is charged as part of the system fee at County facilities, and that must be remitted by all haulers collecting waste in-County (through collection rates) that do not use the County system. The ordinance does not prohibit waste export (which would likely be subject to successful legal challenge) but rather is based on the premise that certain system costs should be borne by all generators in the County, regardless of where waste is disposed. The SBC began as the equivalent of \$16 per ton, and covers:

1. Closure and post-closure cost for older portions of the landfill that had been used in the past by all generators.
2. The cost of the rural container sites, including the cost of transfer to the landfill, but not the cost of disposal.
3. The entire cost of County recycling and waste prevention programs at the rural sites and at the central transfer station.
4. The entire cost of the special waste and HHW programs, except for disposal costs associated with inadvertent County collection of such wastes at the central transfer station and landfill.
5. The share of County staff and overhead costs directly related to providing the above services.

The SBC had the effect of canceling the lower tip fee advantage of the out-of-County landfill and within months exports dropped to a negligible level and system finances were restored.

Nearby Counties as Potential Partners

Introduction

The counties of Del Norte, Humboldt, Mendocino, and Napa are in relatively close proximity to Sonoma County and are each exporters of solid waste. Currently there are two possible opportunities for future cooperation with one or more of these counties:

- Sharing use of a North Coast landfill, were a new landfill to be sited and developed within the five county area, and/or
- Participation in an export agreement to transport solid waste to a landfill(s) located outside of the five county area, should larger volume result in a lower price.

BVA staff interviewed senior staff overseeing solid waste management for the four counties regarding the above scenarios as well as information on organizational and institutional

issues.¹ As part of the interviews, BVA staff also collected solid waste system financial information that will be used in later analysis. This included analysis of the economic feasibility of the above two scenarios. It was determined that staff of three of the four counties (Humboldt, Mendocino, and Napa) exercise varying degrees of flow control, are not locked into long-term disposal agreements, and would be interested in possible joint disposal arrangements and/or other areas of cooperation. Del Norte County has a long-term disposal commitment.

Del Norte County

Del Norte County's solid waste system is owned and operated by the Del Norte Solid Waste Management Authority, which was formed in 1992 and includes Del Norte County and the City of Crescent City. The Authority operates the Crescent City Landfill that is scheduled to close in February 2005.

The Authority has built a new transfer station, the Del Norte Transfer Station, which will begin out-of-County transfer of waste in 2005. The Authority has a 15-year contract with the transfer station operator, Hambro, which in turn subcontracts with the Dry Creek Landfill in Medford, Oregon for disposal. The landfill is 125 miles from the transfer station. The transfer station is permitted to receive up to 200 tons per day of solid waste, recyclables, and compostable materials and is expected to receive about 75 tons per day.

The Authority also owns and operates two limited-volume transfer operations, the Gasquet Transfer Station and the Klamath Transfer Station. The Authority has an independent staff with ten staff members. Authority staff operates the scale houses at the landfill and at each of the transfer stations.

The Authority contracts for landfill operations with Pacific Waste Services and contracts with Del Norte Disposal for collection services. The collection contract covers the entire Authority service area (except for the state owned prison) and includes flow control to the Authority's facilities. Collection service is not mandatory in the unincorporated areas. Total tons disposed through the Authority system is approximately 20,000 tons per year.

The Authority is also responsible for AB 939 planning, reporting, and recycling program implementation. In 2000, the Authority adopted its zero waste plan, which includes the development of a resource recovery park at the new transfer station to maximize diversion. Phase 1 of the facility will include areas to recover soils, asphalt, concrete, yard debris, non-treated lumber, appliances, refrigerators, tires, metals, and household hazardous wastes. Phase 2 of the facility will include increased recovery and processing of salvaged, recovered, and used items and recyclable materials.

¹ Kevin Hendrick, Director, Del Norte Solid Waste Authority, (707)465-1100; Gerald Kindsfather, Director, Humboldt Solid Waste Authority, (707)268-8680; Paul Caylor, Deputy Director, Department of Transportation, Mendocino County, (707)463-4078; Trent Cave and Jill Pahl, executive directors of the Napa-Vallejo Waste Management Authority and Upper Valley Waste Management District, (707)253-4410, respectively.

Authority operations are funded through landfill and transfer station tipping fees, a ten percent franchise fee on the collection contract, and grants. The Authority's budget is completely independent from the County. The Authority's \$1.36 million budget is allocated as follows:

- 6 percent – closure and post-closure account
- 42 percent – general operating, staffing, administration
- 9 percent – resource recovery infrastructure (AB 939 programs)
- 43 percent – payments to the Authority private landfill and transfer station operators

The Authority is responsible for the closure and post-closure costs of the Crescent City Landfill. There are some closed unpermitted burn dumps in the County that are monitored by the Del Norte County Department of Environmental Health. The tipping fees are approximately the same at the landfill and the container sites (although the fees at the landfill are weight-based and the fees at the container sites are volume-based), and the system-wide revenues help to subsidize the cost of the container sites. Self-haulers have relatively convenient access to the transfer stations. Most residents are within 15-20 minutes of a transfer station except for the northern-most part of the County where some residents are 25 minutes away from a landfill or transfer station.

Because of the Authority's distance from Sonoma County and its 15-year commitment to the Dry Creek Landfill in Medford, Oregon, the Authority is probably not a good candidate for working with the County in developing regional landfill capacity.

Humboldt County

The Humboldt Waste Management Authority (Authority) is an enterprise fund formed in 1999, and covers the entire County area except for two smaller cities. About 83,000 TPY comes through the Authority system, while about 7,000 tons of other county waste is handled privately. The Authority has its own staff, and finances, owns, and contracts for the operation of the Hawthorne Street Transfer Station, which processes over 75 percent of the County's waste stream. Solid waste is then transferred for disposal at Anderson Landfill in Shasta County and at Dry Creek Landfill near Medford, Oregon. The non-Authority portion of the waste stream is disposed at Anderson.

The Authority also owns and operates one smaller transfer station that serves as a larger rural drop-off facility, and twelve rural container sites. There are two privately-owned transfer stations in the County. The Cummings Road Landfill formerly was owned by Norcal, but is now owned by the Authority. Cummings Road is closing, and has not accepted waste since 2000. There are no other privately owned landfills in the County, but there is one closed landfill that is County-owned.

Waste Solutions Group, Inc developed the Hawthorne St. Transfer Station under a 1997 contract with the Authority with a term of 15 years. The Authority is now negotiating with Waste Solutions to exercise a buy-out clause in the contract, which extends to the disposal portion of the contract. The Authority intends to take over full operation of the facility, and

may have increased latitude regarding disposal. Authority management staff strongly feels based on experience, that facility ownership, operation, and collection, should all be public sector functions.

The Authority agreement requires that each member agency retain flow control and direct waste to either the Authority facility, or to an Authority-designated facility. There is no flow control exercised over the self-haul portion of the waste stream. The Authority directs the flow of transferred solid waste from the Hawthorne Street Transfer Station. Currently, about half of the waste goes to Dry Creek Landfill and half to Anderson Landfill. The decision about which facility to use is based on Authority negotiation with the transporter regarding backhaul, generally of wood chips to reduce transfer costs. Sometimes both facilities are used in one day.

With regard to the system of twelve drop-off facilities, some are open only one day per week, while others are open only three days per week. One facility collects only 10 tons per year of waste. Some of the facilities offer limited recycling. The facilities are expensive, and logistically difficult to manage, for example, when the gate staff at a remote site calls in sick.

There is currently no mandatory collection service in Humboldt County. In 1996, self-haul represented 28 percent of the total waste stream, but is much higher in the unincorporated area. While there is some interest in instituting mandatory collection, there are concerns about Proposition 218 and how to: 1) structure payment (as service fees through collection rates or on utility bills) and 2) allow for opt-outs such as for self-haulers, and high volume recyclers that produce little or no solid waste. Administration of an opt-out program also adds to total costs. There are no immediate plans to institute mandatory collection in the unincorporated area.

With regard to system expenses, the Authority charges different fees at the main facilities: 1) tip fees of \$87.35 per ton and \$77.78 per ton at the Hawthorne Street facility for self-haul and compacted waste, respectively, and 2) a fee of \$97 per ton for compacted solid waste at the Redway and Garberville transfer stations, and its equivalent for self-haul on a per-container and per-cubic yard basis. The tip fees include \$9.28 in fees for HHW and AB 939 programs, illegal disposal, maintenance of closed landfills, state LEA fee, and partial cost of the rural container sites. The rural sites are funded by a combination of gate fees, the tip fee surcharge (levied on all tons) and a small subsidy from the County's General Fund. Other than this one subsidy, Authority finances are autonomous. The various jurisdictions collect franchise fees on collection rates, ranging from two or three percent for most cities, to five percent for the County and ten percent for Arcata.

The County and the cities conducted an extensive but unsuccessful landfill siting study in the early to mid-1990's, prior to deciding to develop a transfer station and export waste out-of-County. Authority staff indicated potential interest in disposing at another location if: 1) a regional landfill site was developed in another North Coast county, or 2) if contractually combining waste streams with Sonoma County (and possibly one or two other counties) led to a volume-based price reduction at an existing landfill.



Mendocino County

Mendocino County's solid waste system is primarily owned and operated by the private sector, with public exercise of flow control through County and City collection agreements. Total waste flows are about 200 TPD. Solid waste responsibilities are divided between the County and a joint powers authority:

- Mendocino County Department of Transportation staff operates five County-owned container sites in more rural areas of the County, and manage collection and diversion programs operated by private sector collectors in the unincorporated area. The County also has direct responsibility for three publicly owned landfills that are in various stages of closure or post-closure.
- The Mendocino County Solid Waste Authority (MCSWA) manages AB 939 reporting for each of the jurisdictions, conducts recycling, HHW and e-waste collection, and public education programs. The MCSWA covers all County jurisdictions except for Point Arena.

Geographically, the County can be divided into coastal and inland areas. Several larger collectors operate in the coastal portion of the County, and Solid Waste of Willits (SWOW) owns and operates several transfer stations. The Ukiah area and the rest of the eastern portion of the County is served by a transfer station located in the city of Ukiah and owned and operated by the North Bay Corporation. The County has an agreement with the City for use of the facility for the unincorporated waste stream. The City's agreement with North Bay and the County's use agreement with the City both provide the ability to direct the flow of waste.

The entire County waste stream is transported to Potrero Hills Landfill in Solano County:

- North Bay Corporation transfers solid waste from the Ukiah Transfer Station to Potrero Hills, and County staff has to date been unable to review the contract. (The County and the City of Ukiah, for a variety of reasons recently denied North Bay's request to transfer waste to the Redwood Landfill in Marin County as an alternative.)
- SWOW transfers waste originating in the coastal and northern areas of the County to Potrero Hills from its Willits Transfer Station. SWOW's disposal contract has a 15 year term, ending in 2015. The contract provides for a "most favored" fee of \$19.57 per ton, which is annually escalated by 90 percent of the CPI.
- The County directs transfer of a small amount of waste (150-200 tons per month) collected at a small self-haul facility in the southern coastal portion of the County through Sonoma County's Annapolis Transfer Station to Potrero Hills. Through a complex arrangement, the County compensates Sonoma County with a licensing fee, North Bay's subsidiary for the cost of the transfer, and Potrero Hills (through the franchise agreement with North Bay) for disposal. Mendocino County staff is interested in discussing with Sonoma County staff options for simplifying this arrangement, perhaps with a single per ton tip fee.

Most of the single-stream recyclables are processed in Santa Rosa at North Bay's and Empire Waste's MRF facilities. In addition, one hauler transports some single-stream recyclables to Upper Valley Disposal's processing facility in St. Helena (Napa County).

With regard to funding, the County's facility system is funded by gate fees paid by self-haulers (soon increasing to \$17.00 per cubic yard) and through an annual County general fund subsidy of about \$500,000 which represents about one-third of the County's solid waste budget. The cost of the County's closed landfills is funded through a seven percent franchise fee on collection. The MCSWA is funded through a tip fee surcharge of \$4.50 per ton that is levied at all transfer facilities in the County, and hence on all tons generated in the County.

With regard to areas of possible future cooperation, Mendocino County staff note that the County:

- Would be interested in importing waste to Sonoma County's Central Landfill, if it can successfully be expanded and the import restriction lifted.
- Would like to be involved should Sonoma County embark on a landfill siting study, but is not interested in attempting to site a landfill in Mendocino County.
- Would like to discuss restructuring of the means of compensation to simplify payment for use of the Annapolis Transfer Station and disposal at Potrero Hills. This issue is of utmost immediate interest to Mendocino County.
- Believes it unlikely that use of rail haul to transport waste to the Devlin Road Transfer Station in Napa County will be feasible due to the extremely poor condition of the existing track and the expense of restoring it. (As discussed below, Napa-Vallejo Waste Management Authority staff noted the possibility of rail haul from Mendocino and Humboldt counties.)

Finally, Mendocino County staff indicate concern about significant impact to the regional landfill market, and the price and availability of capacity at least in the near-term should Sonoma County abruptly export much or all of its waste stream.

Napa County

Napa County has two joint powers agencies for solid waste management:

- The Napa-Vallejo Waste Management Authority (Authority) serves the southern portion of Napa County, and Vallejo in Solano County. The Authority owns the Devlin Road Transfer Station, located in the City of Napa and contracts for facility operations with Allied, Inc. The facility manages about 251,000 TPY, and the current tip fee is \$54 per ton. Waste is transferred to Allied's Keller Canyon Landfill in Contra Costa County, near Pittsburg.
- The Upper Valley Solid Waste Management District (District) oversees collection and disposal contracting for the northern incorporated and unincorporated areas of the



County. Collection and disposal services are provided under separate contracts by Upper Valley Disposal, which owns and operates the Clover Flats Landfill. The District is now negotiating a lower disposal tip fee, now \$54 per ton with Upper Valley Disposal.

Napa County is currently pursuing competitive procurement of new collection services for the Zone 1 unincorporated area immediately surrounding the City of Napa. Under the new franchise agreement, new residents or homeownership transfers will be required to have mandatory service. The mandatory service will be instated through a modification to the County solid waste ordinance and voted on by the Board of Supervisors. There is no mandatory collection in the District.

The Authority does not have actual flow control agreements with the member agencies; however the City of Napa and County of Napa, Zone 1, have explicit requirements in their franchise agreements to send the waste to Devlin Road Transfer Station. Due to the bond debt, Vallejo and American Canyon have financial responsibility for proportional cost of the facility, thus it directs its haulers to use the transfer station.

With regard to funding, both the Authority and District are separate enterprise funds financed through tip fees, and the Authority has supplemental landfill gas revenues. Both agencies are staffed by County staff provided under contract. The County provides the staff for each agency and a portion of these fees is allocated to public education programs, HHW programs, the Recycling Market Development Zone, and community grants.

With regard to areas of future possible cooperation, Napa County staff note that:

- The County is not currently importing any waste except for a relatively small amount that Upper Valley Disposal collects in Lake County and brings to Clover Flats.
- Both Authority and District, in the past, have been open to discussing cooperative arrangements and would continue to be so in the future.
- District staff notes that Upper Valley Disposal would be interested in importing waste, and the District would also be interested if it benefited District customers and if adequate capacity remained for the District.
- The Authority mentioned the option of rail-haul to Devlin Road Transfer Station as a point of discussion although Mendocino County staff note the poor condition of the infrastructure and questions if this could be made viable.

Finally, the Authority is currently conducting an analysis of the advantages and disadvantages of privatizing all or a portion of the solid waste system, especially in regards to the construction and operation of a construction and demolition debris facility.

Survey of Landfills for Export of Solid Waste

A survey was conducted to gather information for eleven out-of-County landfills that potentially could serve as a disposal site(s) for some or all of the Sonoma County waste stream. This includes nine privately owned and operated sites, and two that are publicly owned and operated. Other than for the two exceptions noted below, all of the landfills

would require use of a transfer station and long-distance truck transfer. These landfills may be economically feasible, should capacity be available and given the combined cost of the transfer and disposal fee. A summary of the survey is shown in Table 2 and includes:

- Four landfills that are relatively close to Sonoma County (less than 150 miles roundtrip from the centroid), and that in some cases are now taking waste from the immediate region, including Clover Flats, Keller Canyon, Portrero Hills, and Redwood. The two nearest landfills, Clover Flats and Redwood (capacity questions aside) could potentially serve southern portions of the County via direct-haul rather than transfer.
- Four landfills that are somewhat more distant, between 150 and 250 roundtrip miles, including Central (Yolo County), Hay Road, Kiefer (Sacramento County), and Vasco Road.
- Three more remote sites that are aggressively marketing capacity and that may be able to offer relatively low gate rates that offset the higher cost of transfer. These sites include Anderson, Forward, and Lockwood, and they range in roundtrip distance from 250 to 500 miles.

Sonoma County has completed its procurement process to acquire contractors for short-term out-of-County haul and disposal. The landfills chosen for short-term disposal include the Keller Canyon, Potrero Hills, Redwood, Vasco Road, and West Contra Costa landfills. The data in Table 2 was used to assist in this process and can serve as a benchmark for potential long-term out-of-County disposal if needed by the County. If future benchmarking is required, two types of cost should be examined:

- Published gate rates, which will provide an upper bound for possible tip fees.
- Contractual disposal fees for longer-term capacity that landfill owners either have recently offered to, or have negotiated with specific jurisdictions. In general, proposals in response to Sonoma County's RFP (or subsequent negotiations) should result in disposal fees that are significantly lower than the published gate rates, and closer to those offered or negotiated on a bilateral basis.

Note that some of the landfills in Table 2 may be later dropped from further consideration for factors including but not limited to:

- A total cost, inclusive of transfer that is prohibitive.
- Inability to provide adequate capacity in the short-term and/or the longer-term.
- County ordinances, permit caps, or other restrictions on imports of waste.
- Site-specific issues of short-term and/or long-term concern such as permit compliance, environmental or geological integrity, traffic access, etc.

The Altamont Landfill (Waste Management, Inc.) is located in Alameda County. Altamont is not included in Table 2 because Alameda County limits imports to Altamont to two

jurisdictions that have been importers for a number of years (City and County of San Francisco and the city of San Ramon in Contra Costa County). In the unlikely event that additional imports would be allowed, State and County fees totaling approximately \$13 per ton would likely result in a prohibitive cost for disposal. Republic's Vasco Road Landfill is not currently subject to these import restrictions and has sizable available capacity. However, as with Altamont, government fees may result in an excessive total cost for disposal.

Note that Allied's Forward Landfill has a very large capacity that has been actively marketed in recent years. However, Forward would not disclose current tons per day of disposal, but recent indications are that the facility is nearing its daily capacity.

BVA staff also interviewed county staff regarding publicly-owned landfills in Lake and San Joaquin counties that do not appear in Table 2. Lake County's Eastlake Landfill was included in the survey due to relative proximity. Like the privately-owned Clover Flats, Eastlake Landfill is relatively nearby, but quite small. We were informed that Lake County does not accept waste from outside the county.

San Joaquin County has several landfills that potentially have the necessary capacity and in recent years have lost waste to Forward. County policy currently does not allow import of waste unless an agreement is signed that requires the importer to pay a mitigation fee for impacts to air, traffic, etc. There is no precedent for importing waste, so pricing is unknown. San Joaquin County is now in the process of expanding permit capacity, and in addition, County policy may change regarding mitigation for imports.

Note that the survey did not include consideration of newly developed landfill sites. This is due to the fact that no new landfills have been developed in Northern California in many years. The only recently developed landfill sites that have been allowed to be constructed were located in the drier and remote areas of Southern California. This may in part be due to Regional Water Quality Control Board preference for landfill construction in drier regions.

Table 2 - Market Survey of Out-of-County Landfills

Landfill Name, Owner/Operator	County, Roundtrip Distance	Estimated Closure Date	Capacity		Bilateral Arrangements					Published Gate Rate	Comments
			Permitted (TPD)	Current Disposal (TPD)	Jurisdiction, Term	Effective Date of Rate (per ton)	Base Fee (per ton)	Host Fees (per ton)	Total Disposal Fee (per ton)		
Vasco Road Republic	Alameda County 190 miles	2015	2,518	1,500	Livermore 10 years	1/1/2004	\$13.85	\$12.37	\$26.22	\$15.85/cubic yard estimated \$63.40/ton	Negotiated price offered during a competitive procurement of collection and disposal.
Keller Canyon Allied	Contra Costa County 147 miles	2040-2070	3,500	2,940	Central Contra Costa SWA 10 yrs Napa-Vallejo JPA (Devlin Rd), 12 yrs	3/1/05 7/1/04	\$16.40 \$30.65	\$5.50 \$10.22	\$21.90 \$40.87	\$20.00/ton	Current disposal at Keller Canyon is a 12-month rolling average. Contra Costa County has fee equal 25 percent of total disposal fee.
Redwood Waste Management	Marin County 44 miles	2039	2,300	1,200	Petaluma 10 yrs	7/1/2004	\$31.45	\$5.42	\$36.87	n/a	Current disposal is based on annual total for 2002 from CIWMB. Redwood representative would not disclose current actual disposal or gate fee for compacted MSW.
Clover Flat Upper Valley Disposal	Napa County 41 miles	2021	300	200	Upper Valley WMD		Approx \$48.00	Approx \$6.00	\$54.00	\$54.00/ton	n/a
Kiefer Sacramento County	Sacramento County 210 miles	2064	6,300	2,500	n/a	n/a	n/a	n/a	n/a	\$26.00/ton	Interested in imports; currently taking waste from Amador County. Can do longer-term deals in the +/- \$20 range. Have negotiated rates as low as \$15 per ton. Can take additional waste as beginning Janayr '05, once have final Corp of Engineers 404 permit.
Forward Allied	San Joaquin County 251 miles	2020	8,668	n/a	Fremont, 10 yrs	9/1/2004	\$16.90	\$1.90	\$18.80	\$40.00/ton	Fremont negotiated the rate of \$18.80 with Forward, but due to a legal challenge is instead using Altamont. Also awaiting a response from Manteca which uses Forward.
Anderson Waste Connections	Shasta County 454 miles	2036	1,018	700	Humboldt Waste Management Authority 15 yrs	7/1/2004	n/a	n/a	\$23.51	\$7.00/cubic yard estimated \$28.00/ton	Actively marketing capacity, but long distance.
Potrero Hills Republic	Solano County 136 miles	2015-2063	4,330	3,049	Ross Valley San Dist (Marin Co) 10 yrs West Contra Costa SWA 7yrs, 21 yrs	10/01/02 2004	n/a \$18.36/\$15.26	n/a \$6.10/\$6.10	\$36.00 \$24.46/\$21.36	\$40.00/ton for commercial or hydraulic trucks	Ross Valley gate fee proposed during a competitive collection procurement. WCCSWA fees proposed by Republic as part of a negotiation regarding long-term transfer, siting of a new facility, ongoing MRFing and other issues. Rates for for 7 yrs and 21 yrs, respectively. Mendocino County staff state that Portreo Hills "most favored rate" is \$19.57.
Hay Road Norcal	Solano County 162 miles	2070	2,400	550	Solano County jurisdictions	n/a	n/a	n/a	n/a	\$36.00/ton	Up until the late 1990's Hay Road had a "most favored nation" price, but no longer does. Solano County jurisdictions are paying \$36.00 per ton, and if Sonoma County used the landfill Norcal would recalculate system costs and decrease the \$36 gate rate for both Solano and Sonoma counties.
Lockwood Waste Management	Washoe County, Nevada 489 miles	2026	no TPD limit	8,000	Northern California JPA	n/a	n/a	n/a	\$14.00	\$3.45/cubic yard estimated \$13.80/ton	Lockwood rates have in recent years been in the \$12/ton range. A BVA client was recently quoted the \$14 per ton figure for long-term disposal of sizable tonnage.
Central Yolo County	Yolo County 180 miles	2045	1,800	500	n/a	n/a	n/a	n/a	n/a	\$36.00/ton	Yolo County staff indicated interest in out-of-county tonnage and noted that the cap is kept higher than current need.

General Notes:
1. Distance is roundtrip from central Sonoma County centroid. Source: 1999 Engineer's Rept, Table 3-6.
2. Assumes transfer/haul, except for direct haul to Redwood for central/south County.
3. Published gate rates are inclusive of government fees and except as otherwise noted are for transferred MSW.
4. Converted compacted gate rates in \$ per cubic yard to \$ per ton using 500 lbs per cubic yard.



This page left blank.

APPENDIX C

**Zero Waste Project and Program Ideas
Sonoma County Local Task Force - Solid Waste, Zero
Waste Sub Committee
January 2005**

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Topic	Materials Exchanges				
Author	Sammy Nasr	Email	sammymnasr@comcast.net	Phone	707-829-2324
Abbreviated Major Points: 20 words or less per point <ul style="list-style-type: none"> Local material exchanges need coordination, refinement and promotion – especially for businesses. Generally underutilized, while email networks going gangbusters. Resources: SonoMax, Bay Area Creative Reuse, Freecycle, Volunteer Center of Sonoma County, Craig's List, CalMAX, Keywords: Waste Exchange, Material Exchange, Reuse, Creative Reuse Implementing Agencies: SCWMA for Sonomax Possible Funding Sources: Bag fee, Advanced Recycling Fee, CIWMB grant Issues: BROADLY expanding Material exchanges for business 					
Summary: The feasibility would have to be studied and followed up with adequate publicity					
Resources:					
Sonomax			www.recyclenow.org		
CalMax			www.ciwwmb.ca.gov/CalMAX		
Bay Area Creative Reuse			No web site found – a program of the SCWMA		
Freecycle This is a freecycle group for the North Bay. There are only two hard and fast rules, ALL offers and wanteds must be FREE and keep it legal and appropriate for all ages.			http://groups.yahoo.com/group/freecyclesonomacounty From the Austin group: "Freecycling lies somewhere between the garage sale and the dump, and is much cooler than both. It's an innovative concept that harnesses the power of the Internet to do what the Internet does best -- eliminate the middleman and empower the individual. Unlike traditional charitable organizations that accept people's castoffs and sell them for low prices in unappealing shops (or end up taking them to the dump anyway), freecycling allows for personal contact between donor and recipient -- each gets exactly what they want, and nobody is considered a 'charity case.' (Indeed, many freecyclers both give and receive items on a regular basis.) It's a perfect consumer-friendly circle: no overhead, no intermediaries, no money changing hands, no waste and no catch, and everyone's happy.		

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Topic	Reducing and Recycling Organic Waste Materials in Sonoma County				
Author	Paul Paddock, Sonoma Compost	Email	ppaddock@sonomscompost.com	Phone	578-5459
Abbreviated Major Points: 20 words or less per point					
<ul style="list-style-type: none">• A partial list of organics includes materials such as yard debris, unpainted and non-pressure treated wood waste, food waste, paper, cardboard, manure, agricultural by-products and fish waste.• All new programs or projects must insure that the recycling and composting of additional organics don't impact the marketability of the compost and mulches currently produced.• Implement a bag reduction program - encourage businesses to offer bags only if there is an obvious need. Create a sign program to explain the county-wide goal. Encourage the use of re-useable bags through public education and incentives.• Expand the list of banned materials at the landfill to include all fractions of the organic wastestream• Maximize the sorting and separation of organics at transfer stations and the Central Landfill and divert to recycling; insure that these materials don't get landfilled out of county.• Resources: TBD• Keywords: Landfill bans, reducing and recycling organics, contaminants,• Implementing Agencies: TBD• Possible Funding Sources: TBD• Issues: TBD					
CURRENT ORGANICS DIVERSION STRATEGIES					
Banned: Yard debris, wood waste and cardboard are currently banned from the landfill.		Yard debris is made into compost, mulches and a bulking agent for the City of Santa Rosa's bio-solid composting facility. It is also sold as bio-fuel to generate electricity. Wood rounds are split and sold as firewood. A small percentage of "overs" from the compost screening process is used for alternative daily cover at the landfill.			
		Wood waste is made into a mulch and sold as bio-fuel. Pallets and some dimensional lumber are sold to the public. Cardboard is recycled.			
		Manure is composted, land applied or made into fertilizers. Agriculture by-products are converted into various products including animal feed, or composted. Fish waste is converted into several products, including fertilizers, composted or landfilled.			

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

REDUCING AND RECYCLING ORGANICS	
Business	Mandate that every business have a source reduction and recycling plan.
	Grade businesses on their reduction and recycling efforts as a way of rewarding those with aggressive policies and nudging those that don't.
	Encourage the use of re-useable tableware at restaurants.
	Encourage alternatives to paper towels in the commercial, industrial and institutional settings.
	Reduce the use of disposable (paper) grocery and shopping bags.
	Encourage greater use of mulching mowers in commercial landscapes.
	Encourage on-site composting of greenwaste and foodwaste where feasible.
	Divert appropriate food waste from commercial, industrial and institutional sites to a permitted composting facility
	Implement an aggressive paperwork reduction strategy. Example: target easily identifiable business sectors such as utilities, banks, credit card companies and other financial institutions and point out the economic and environmental benefits that would occur by eliminating unnecessary paper in their mailings.
	Encourage the re-use of envelopes
	Work with local manufacturers, as well as those that import products to Sonoma County, to reduce the amount of packaging included with products.
Residential	Encourage every household in the County to have a waste reduction and recycling plan.
	Set a goal of diverting 100% of residential yard waste to the Green Can rather than the refuse can in areas with curbside collection.
	Create incentives for residents who pass spot checks indicating their garbage cans are 100% free of yard debris or food waste appropriate for composting.
	Encourage greater use of mulching mowers in residential landscapes.
	Expand Green Can collection to include residential food waste appropriate for composting.
	Encourage the use of alternatives to paper towels in residential settings.

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

	Capture and divert all yard and wood waste at transfer stations and the Central Landfill to the Organic Recycling Program.
General Zero Waste	Create a county-wide zero waste culture that is recognized as benefiting rather than penalizing residents and the business community.
	Set countywide waste reduction goals with deadlines.
	Create incentives for communities to compete with one another in achieving zero waste goals.
	Create a position and hire a county waste reduction coordinator.
	Create an awareness that there should be a reasonable relationship between the size of an item and its packaging.
	Work in concert with other communities at the state and national levels that have already implemented zero waste policies or that are interested in doing so.

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Title	Refilling Station Contest				
Author	Paul Palmer	Email	paulp@sonic.net	Phone	707 823-5181
Abbreviated Major Points: <ul style="list-style-type: none">• To advance the state of knowledge and investment in a more advanced and civilized way to treat excess commodity products.• To eliminate garbage in the county.• To support concepts of Zero Waste generally.• Specifically, to eliminate the pressure for discard of perfectly refillable containers and to eliminate the sale of refillable commodities in prepackaging in the county.					
Summary: The County hold a \$25,000 competitive design for a retail refilling station filling a variety of containers with flowable consumer supplies.					
Details: See companion file <p>The successful entry will consist of a comprehensive design for a large store to be located in an urban setting. Customers will be able to bring empty containers of any and every description and fill them with flowable contents. Flow able refers here to liquids, powders, grains, pills and any other commodity which can be induced to flow from a delivery system into a container. (This may even include solids that must be manually assisted in their transfer so long as they are commonly dispensed in refillable containers). Design will extend to methods of dispensing, methods of payment or checkout, modes of construction, methods of storage and inventory management and methods of financing.</p> <p>It is anticipated that the successful design will be implemented and lead to the construction of a working refilling station somewhere in Sonoma County. For that reason, points will be allotted to a realistic financing or investment component. A grace period of up to six months can be negotiated after the design award during which details of the design, needed for actual investment and construction, will not be made public. The award winner is not prevented from parallel implementation of her design in other regions of the country.</p> <p>The completed design will become the property of the county of Sonoma. For a period of one year, the award winner can apply for, and be granted as a matter of right, for one dollar, an exclusive license to use the design.</p>					

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Topic	Reuse Facility including ATool Lending Program				
Author	Portia Sinnott	Email	wastenot@sonic.net	Phone	707 824-9931
Abbreviated Major Points: 20 words or less per point					
<ul style="list-style-type: none">• Promotes skill development/empowerment/reuse and rebuilding; utilizes existing resources when ever possible; discourages the purchase of rarely used tools, disposable and limited-use tools;• Resources: Should include manuals, videos and other resources including how-too classes ad organizations• Keywords: Community Development, Energy Conservation, Earthquake Preparedness, Fixer-Uppers, Youth Programs, Bike Repair• Possible Funding Sources: Community Development Block Grant, Library Funding, Clean Cities Coalition, CIWMB• Issues: Power versus hand tools, Repair, Safety, Hold harmless waivers, Liability insurance for power tools, Tool Tracking/Theft, Services already offered by rental companies• Implementing Agencies: County Library and SCWMA					

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Summary Utilizing existing Tool Lending Libraries as the model, create a reuse and repair facility that promotes and facilitates local repair and reuse programs and classes including those already held in Sonoma County such as at Home Depot, Santa Rosa Junior College and clubs like the Electric Auto Association and Community Bikes.	
Background Tool Lending Libraries, by Kevin Kelly http://www.kk.org/cooltools/archives/cat_general_purpose_tools.php A decade ago some community librarians in California initiated a great idea: why not lend tools as well as books? The idea slowly spread to a couple of dozen other US towns, but the most active and well-stocked tool libraries are still in the Bay Area -- one in Berkeley, Oakland and San Francisco. The typical tool lending library offers basic hand tools, and a selection of garden, landscaping and construction tools. The hot items with waiting lists at the San Francisco Tool Lending Library are heavy duty power tools. The top four borrowings are: an electric jack hammer, a drain snake for clearing sewage lines, an electric weed wacker (the library only deals with electrical tools, no gas), and rotary impact drills. There are racks of shovels, rakes, stampers, crow bars, pliers, and the usual shop tools, but the Saws-alls, belt sanders, wet tile saws, and other not-so-often needed tools get the most rotation. Many of these occasional tools are what you might find at a tool rental shop; indeed anyone with a city library card -- including contractors -- can, and do, borrow tools for the maximum 3 days. Lending tools, like planting trees, is unalloyed goodness. Tool Lending Libraries are a great idea that should be duplicated everywhere. The biggest cost is not the tools but the liability insurance for the power tools. Patrons are pretty good at returning things in good order -- they want to be able to use 'em again.	
RESOURCES	
Municipal Programs	
Berkeley Tool Lending Library, CA	http://berkeleypubliclibrary.org/tool/ abroner@aaahawk.com, jarmstrong@ci.berkeley.ca.us Initially funded by the Community Development Block Grant now by the Library
San Francisco Tool Lending Center, CA	http://sfpl.lib.ca.us/librarylocations/branches/toollending.htm , www.sfcleancity.com/tool-lending/index.html Gia Grant, 415 553-2913 415 701 TOOL, gia@sfcleancity.com , A project of SF Clean City Coalition funded by the SF Library
San Leandro Earthquake Preparedness Program, CA	http://www.ci.san-leandro.ca.us/city-tools.html 510 577-3405
Temescal Tool Lending Library, Oakland, CA	http://www.oaklandlibrary.org/Branches/tll_toolsched.html Ty Yurgelevic , Branch Manager, 510 597-5089, tyurgele@oaklandlibrary.org

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Takoma Park Tool Lending Library, MD	Takoma Park, Maryland
Greensboro Public Library, NC	http://www.greensborolibrary.org/mh/tools.htm
Organized Neighbors of Edgehill, Nashville, TN	
Grand Prairie Neighborhood Revitalization Division, TX	http://www.gptx.org/housing/revital.asp
Pinney Neighborhood Center, Seattle and Kirkland, WA	www.irkland.wa.us/depart/fire_bldg/bldg/project_impact_howto.htm www.phinneycenter.org/programs.shtml A City of Seattle Community Center??
Energy Programs	
PG&E Pacific Energy Center Tool Lending Program, CA	www.pge.com/003_save_energy/003c_edu_train/pec/toolbox/tll/tll_home.shtml A Public Goods funded program that loans tools free of charge to people working on short term energy efficiency projects in California.
San Diego Region Energy Resource and Education Center, CA	http://www.sdreo.org/oldsite/sderc/index.html
Silicon Valley Power, Santa Clara, CA	City of Santa Clara's electric utility http://www.siliconvalleypower.com/res/?sub=toollibrary
CA Sonoma State Energy Technology Center, CA	armando.navarro@sonoma.edu
Focus on Energy, Green Bay, WI	http://www.focusonenergy.com/page.jsp?pageId=327
Community Development Programs	
Atlanta Community Tool Bank, GA	http://www.toolbank.org/
Kalapana Phana Assoc	
Neighborhood Finance Corporation, Des Moines, IA	http://www.neighborhoodfinance.org/FinanceInfo.aspx?PageRef=LendingLibrary 515 244-8665
Westside Housing CDC, Kansas City, MO	www.westsidehousing.org/tool_lending_library.htm
Missoula Urban Demonstration Project (MUD), MT	http://www.mudproject.org/programs/tool.htm Karin Schlam and Eugene Lowe, 406 721-7513, mud@wildrockies.org
South East Area Coalition, Inc. (SEAC) and North East Area Development (NEAD) Rochester, NY	seac@rpa.net
North Portland Tool Lending Library, OR	nopotool_library@yahoo.com

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Organized Neighbors of Edgehill, Nashville, TN	
Keep Denton Beautiful, TX	http://www.kdb.org/tool_library.asp
Neighborhood Revitalization Division Grand Prairie, TX	http://www.gptx.org/housing/revital.asp

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Topic	Zero Waste Events				
Author	Mary Munat	Email	mary@harmonyfestival.com	Phone	707 548-7582
Abbreviated Major Points: Resources: Conservation Corps (existing and starting one in this county); local recycling and composting companies; local training agencies for events recycling; event organizers and venues Keywords: Recycling, reusing, composting, training conservation corps teams Implementing Agencies: See Resources below Possible Funding Sources: Fees from venues and event organizers to fund zero waste campaigns and mandatory recycling, sponsorships Issues: Advancing zero waste efforts, educating special events attendees who in turn bring new behavior home, enforcement of AB2176 - mandatory recycling and county-wide ban on styrofoam usage at events on county property.					
Summary Emphasis on reducing waste AND recycling by going with reusables, move away from single use products altogether, composting at as many events as possible, partnering with composting and recycling companies to have zero waste campaign at top events and venues in the county. Nine city and countywide enforcement of zero waste efforts.					

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Details

Invest in a mobile dishwashing station and use reusable dishware wherever possible. Have Zero Waste (county sponsored) booth and team at many special events to oversee recycling and reduced waste, education campaign.

Start a Conservation Corps as in Marin and SF counties to train young people in waste reduction, recycling, education campaigns.

Appoint city and county reps to be contact person for waste reduction efforts including special events enforcement, as per AB217 requiring recycling at top 10% of venues. Install or rent water refill stations for special events for people to refill their reusable water bottles.

AB 2176 - Local Agency facilitates solid waste reduction, reuse, and recycling programs at large venues and events.

State mandated recycling at all large events (top 10%) - set schedule of those events, countywide and city by city and contact them all NOW regarding new mandates.

Enforce county ban on styrofoam products on public property.

Provide event producers and venues with lists of biodegradable supply providers. Emphasize sustainability - recycled content, tree-free.

Develop clear, concise signage for events that educate vendors and attendees.

Design letter from this task force to all event producers and venue operators regarding waste reduction goals and mandates. Have them appoint a contact person to deal with this crucial aspect of their event(s). This letter needs to include ban on cardboard, yard waste and wood waste from the landfill.

Have compost bins at special events.

Partner with area farms to do our composting on their property - pay them for this service.

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Develop ad campaign for public access TV.

Model Oak Grove Elementary School's zero waste program. Educate the young people.

Make the life cycle of events more transparent - producers and venue operators MUST heed where their stuff goes.

Invest in mobile dish station to move toward reusable food service supplies and away from one-time use.

Set a representative at each city in the county to be the waste reduction contact for those city's special events. Disperse responsibility.

Outreach to smaller events with contact list for recycling companies, composting contractors, specialists in waste reduction and education.

MUST reduce plastic bottle usage - 30 million per day end up in this country's landfills. Poisoning people and the planet.

Propose the installing of water refill stations at many more locations that will fill smaller bottles, not just one gallon bottles. Put them in several key locations in downtown areas, at permanent venues, in concert halls. Money maker for the location, reducing water bottle sales.

Second choice - get a sponsor of water refill stations, like Alhambra, to rent water stations for fairgrounds events, all large one-time and on-going events, like the Wednesday night market.

Partner recycling companies with area non-profits and agencies like Becoming Independent and The Middle Way to provide recycle station monitors at special events. Reduce contamination of recycling totes by having monitors.

Doing special events recycling partnered with educational campaigns will help to change thinking and habits.

Invest in the creation of Sonoma Conservation Corps, as Marin and San Francisco have. These young people are trained to do waste reduction and education at special events and are available to any county or city public event - invaluable service for the youth and the environment.

Have a Task Force booth at special events that does education, outreach, recruiting, sells canvas totes, reusable water bottles and to-go wares. Have plastic and paper bag recycling there too, that we bring right back out to the vendors.

APPENDIX C

Zero Waste Project and Program Ideas

Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee

January 2005

Resources	
Sonoma County Fairgrounds	Eric - facilities mgr.545-0657
Mary Munat, Zero Waste Special Events Coordinator	www.green-mary.com , mary@green-mary.com , 548-7582,
North Bay Corporation	Pam Davis- irecycle@sonic.net , 765-2367, special events toter and bin provider
Sonoma Compost	Bill, 578-5459 - takes special event composting
City of Santa Rosa's Laguna Waste Water Treatment Plant Compost Facility	Mike Reynolds, 543-3374, takes special events composting
Community Access	Several cities use public access to advance zero waste campaign
The Middle Way, Sebastopol	Lydia Edelheidt, 823-8755, has crews of special events recyclers
Becoming Independent, Santa Rosa	527-5904, has crews of special needs adults for special events recycling

APPENDIX C

**Zero Waste Project and Program Ideas
Sonoma County Local Task Force - Solid Waste, Zero Waste Sub Committee**

January 2005

This page left blank.

APPENDIX D

Mandatory Collection Analysis

Mandatory Collection Review

Mandatory collection could be effective in reducing the need for more remote transfer stations and ensuring that all generators are effectively participating in Sonoma County diversion programs. Mandatory collection can reduce system costs by spreading fixed costs over a larger number of users. However, mandatory collection is unpopular in some more rural areas where self-hauling is more prevalent. Sonoma County could consider “grandfathering” existing self-haulers and phasing in mandatory collection over time, allowing generators to opt-out of mandatory collection service by providing proof that they are regularly self-hauling solid waste and recyclables to a lawful disposal site or recycling center by providing monthly receipts documenting the practice, or by demonstrating that they are zero-waste generators.

We recommend that Sonoma County review each of the current eight exclusive solid waste collection areas to see if one or more of these areas could be considered for mandatory collection. If an area is chosen for mandatory collection, we recommend that the Sonoma County implement the approach that the City of Healdsburg and the County of Napa are using for “grandfathering” existing users. In addition, the Sonoma County should require mandatory collection for any new housing or business developments in unincorporated Sonoma County. The County should then consider decreasing transfer station operations, through reducing the hours of operation of the transfer stations or closing some of the transfer stations.

Overview

Many counties in California require mandatory collection¹ of solid waste throughout a portion of the more urbanized unincorporated areas surrounding incorporated population centers. Fresno County is the only California County we are aware of with a large rural area that is considering mandatory collection throughout the unincorporated area. Among the counties with some form of mandatory collection, or intention to adopt mandatory collection, are²:

- Alameda County
- Contra Costa County
- El Dorado County
- Fresno County

¹ Also know as “universal collection.”

² Current BVA staff assisted Fresno, Kern, Riverside, and San Bernardino counties with mandatory collection issues as part of converting the unincorporated areas from permits to franchise systems.



-
- Kern County
 - Kings County
 - Marin County
 - Monterey County
 - Napa County
 - Riverside County
 - Sacramento County
 - San Bernardino County
 - San Joaquin County
 - Santa Clara County
 - Stanislaus County
 - Tulare County
 - Tuolumne County
 - Ventura County

In some counties, such as Riverside, San Bernardino, San Joaquin, and Santa Clara, the county forms collection service areas and manages the collection contracts. In other counties, such as Alameda, Contra Costa, Marin, Monterey, and Ventura, sanitary districts or solid waste districts are formed as separate government agencies to administer (solely or in part) solid waste collection contracting.

The concept of mandatory collection is generally not popular in more rural areas with historically low levels of subscription service. Mandatory service can fairly easily be implemented in more urban unincorporated areas that have relatively high levels of subscription service and that surround population centers with mandatory collection. For instance, in San Bernardino County mandatory collection was implemented in unincorporated areas that had subscription participation rates of approximately 70 percent or above.

In this section, we will discuss motivations for considering mandatory collection, key issues in implementation, and Sonoma County issues.

Motivations for Considering Mandatory Collection

Key factors that tend to motivate consideration of mandatory collection include:

- Achieving economies of scale
 - Increasing diversion
-

- Keeping solid waste within the system
- Increasing revenue, and
- Reducing illegal dumping

Achieving Economies of Scale

Spreading the cost of the collection system across more users and making collection more efficient could reduce collection costs. In Fresno County, mandatory collection provided a 2 to 15 percent cost savings for the ratepayers. There are several possible types of cost savings related to economies of scale:

- Reduction in collection costs due to improved efficiency as city haulers also collect from surrounding areas as part of the same routes. Direct collection costs are reduced for unincorporated customers, while reduced overhead potentially benefits incorporated area customers. In some jurisdictions, city haulers already collect waste from nearby unincorporated areas and are achieving some economies of scale; increasing the nearby number of accounts through mandatory collection should lead to even greater benefits.
- Reduced demand for smaller low volume drop-off container sites and/or transfer stations that are very expensive to operate. The result could be closure of facilities, or reduced hours of operation since facility staffing is a major cost component. Most counties with large rural areas in some form subsidize the cost of the smallest sites, as is the case for Del Norte, Humboldt, and Mendocino counties.³

Increasing Diversion

Mandatory collection could increase diversion by ensuring that all generators participate in the waste diversion programs, including curbside recycling and green waste collection. In addition, with economies of scale it may be possible to collect a broader range of materials than can be offered to self-haulers at rural drop-off sites or transfer stations, and at greater convenience. This latter issue is probably less applicable since Sonoma County's unincorporated area curbside program offers largely the same types and levels of diversion services as are available at the transfer facilities and landfill.

³ In a 1999 study for Lane County, Oregon, the true cost of operating a system of small rural drop-off sites (just the cost of facility operations and waste transfer to a central location) varied from about \$42 per ton to \$235 per ton per facility, and averaged about \$79 per ton. Cite: Brown, Vence and Associates, Inc., Solid Waste System Evaluation, Final Report, Lane County Department of Public Works, March 1999.



Beginning in the early 1990's, many counties considered mandatory collection as part of implementing the requirements of AB 939 programs. In the past several years, CIWMB compliance orders related to failure to meet the year 2000 requirement for 50 percent diversion, have resulted in additional counties, such as Fresno considering, and, in some cases, implementing mandatory collection.

Keeping Solid Waste in the County System

Mandatory collection can help keep all solid waste within the County System by directing flow control through contractual or economic means. A key question is whether a substantial amount of self-haul waste is brought to non-public facilities, and is then transported out-of-County or is directly self-hauled out of Sonoma County.

Increasing Revenue

Increasing the number of accounts with collection can result in greater revenues through a franchise fee. While similar revenue might be generated by increasing gate fees for self-haulers, this may be politically more difficult and may encourage illegal disposal.

Reducing Illegal Dumping

Many unincorporated areas, and in particular the most rural portions experience problems with illegal dumping, stockpiling, burning and/or burying of solid waste on-site. By requiring that all generators receive collection services, often with a specific opt-out for self-haulers, these problems can be reduced. In some cases, bulky items such as refrigerators, car parts, appliances, etc. are illegally dumped in these rural areas. To help mitigate this problem, the collection contract should contain provisions for periodical "bulky" waste pick-up. This should work to alleviate many of these problems.

Key Issues in Implementation

Key issues that are commonly associated with implementation of mandatory collection include:

- Role of self-haul
- Proposition 218
- Setting service fees
- Bad debt
- Collecting service fees
- Road damage and maintenance costs, and
- Access to private roads

Role of Self-Haul

In most rural areas, self-haul is a way of life. In our experience, even in cases in which it can be demonstrated that mandatory collection is not only more convenient but less expensive for the customer (compared to gate fees at self-haul facilities) some residents will state that they do not want mandatory collection. Resistance to mandatory collection can be greatly reduced if self-haul is retained, possibly through an opt-out mechanism. Of course, retaining self-haul may result in failure to achieve savings through drop-off facility closures.

“Grandfathering” is also a mechanism for reducing resistance to mandatory collection. The Napa County Board of Supervisors intends to adopt an ordinance that will require mandatory collection in one collection zone to be applied only to new residents and after each sale of a property. Current residents are not required to adopt mandatory collection through “grandfathering.” The City of Healdsburg implemented this approach to mandatory collection, requiring all new residents to subscribe to collection services, while allowing long-term residents to self-haul. This phased approach has resulted in near universal collection in the City.

Proposition 218

Proposition 218, the Right to Vote on Taxes Initiative, was passed by California voters in November 1996. Proposition 218 requires voter approval for property-related fees, assessments, or taxes. User fees that are assessed on a fee for service basis, such as water, sewer, and solid waste collection, have typically been considered exempt from the requirements of Prop. 218. As cited on the California Integrated Waste Management Board’s (CIWMB) website www.ciwmb.ca.gov, “CIWMB counsel believes that Proposition 218 does not appear to affect fees collected through direct billing, tipping fees, franchise fees, or similar methods. AB 939 fees...are not necessarily covered by Proposition 218 because they do not have to be charged upon parcels, nor as an incident to property.” To ensure that the fees are user-based, and to reduce the risk of a Proposition 218 challenge, some local jurisdictions include an opt-out provision in their mandatory collection requirements, allowing generators to opt-out of mandatory collection service by providing proof that they are regularly self-hauling solid waste and recyclables to a lawful disposal site or recycling center by providing monthly receipts documenting the practice, or by demonstrating that they are zero-waste generators. Opt-outs, however, can be difficult and hence costly to administer and enforce.

Setting Service Fees

Setting collection fees requires some thought in order to avoid unintended consequences. For instance, variable rates (with public education and enforcement to minimize disposal of solid waste with recyclables) can provide a powerful incentive to increase diversion by taking a lower level of service for solid waste. However, in a more rural area variable rates



that provide substantial savings at lower service levels may result in some customers taking the lowest level, and then illegally disposing of the excess they generate.

Bad Debt

Bad debt, non-payment for services, is a substantial problem in rural areas, whether with subscription or mandatory service. Bad debt increases the cost of collection, and also can place added responsibilities on counties. While bad debt rates in cities are often in the range of two to four percent, in rural areas bad debt is often in the eight to twelve percent range. In subscription areas in which customers have the choice of more than one hauler, some customers will rotate service from one company to the next, switching each time the bill is due. Haulers will likely request, if it is not now provided, that Sonoma County assist with bad debt by placing liens on properties. Counties often provide this service on behalf of haulers, but at some added administrative cost.

Collecting Service Fees

One of the challenges in enforcing mandatory collection requirements is the collection of service fees. Typically, if a customer fails to pay a solid waste service provider for collection services, the service provider will stop service at that location, thus squandering the benefits of mandatory collection. Solutions to this problem include:

- **Placing the solid waste collection fee on the utility bill or property tax.** This approach is common in counties where there are community services districts, sanitary districts, or collection services districts. Fees on the property tax may (but not always) create Prop. 218 issues.
- **Placing a lien on the property for uncollected charges.** Liens (or the threat of liens) can be somewhat effective. However, conflicts can arise when it is the tenant and not the property owner who is responsible for paying solid waste collection fees.

Road Damage and Maintenance Costs

In recent years there has been growing recognition of the role that solid waste collection trucks play in damaging road surfaces.⁴ In many unincorporated areas, collection trucks may

⁴ There are some strategies for reducing this impact, although usually at the cost of reduced efficiency. Healdsburg now requires on-board scales so that collection vehicles go off-route once they hit a specific weight. The rate of increase in damage increases rapidly as tonnages increase, so even a relatively small decrease in tonnage can have a significant positive impact. In addition, some cities and counties are now developing mechanisms to collect revenue to offset road maintenance costs as a surcharge on solid waste collection fees.

constitute much of the heavy truck traffic and roads are often built to lower specifications. If collection is already provided in a given area, then adding accounts will not increase relative impact to roads. But if service is new to an area that is largely or completely self-haul, collection vehicles will represent a new impact and cost.

Access to Private Roads

Access to the collection point is a potential problem in rural areas where there are private access roads, and is an issue of road damage and liability. Many private roads are built to lower specifications than public roads and are that much less able to accommodate the wear and tear of a collection truck. Counties with mandatory collection often require customers with private roads to sign a damage waiver with the hauler to release the latter from any responsibility for normal wear and tear on the private roads. Alternatively, if a customer is unwilling to sign a waiver, the customer must bring the collection containers to a collection point on a county road.

Sonoma County Issues

Sonoma County has eight exclusive solid waste collection service areas in the unincorporated portion of Sonoma County and subscription is non-mandatory. According to County staff, approximately 60 percent of households in unincorporated Sonoma County now take subscription service, and this figure is fairly consistent across the eight collection areas. Approval and implementation of mandatory collection can be contentious, especially for areas with lower participation in subscription service. Based on the discussion of the issues above, Sonoma County should consider the following key issues to determine if there is value in pursuing mandatory collection. Any one of these considerations may provide ample reason to implement mandatory collection.

- **Loss of tonnage and revenue.** Although approximately 59,600 tons of Sonoma County's waste was reported disposed outside of Sonoma County in 2003 (CIWMB Jurisdiction Disposal Report), it appears that only about 1,300 tons of this amount may be due to self-haul. The larger subtotals, approximately 20,500 tons to Keller Canyon Landfill, 32,900 tons to Redwood Landfill and 4,900 tons to Potrero Hills Landfill were assumed to be hauled by franchised collectors. From these figures, it does not appear that loss of tonnage to outside Sonoma County from self-haulers is a big factor. However, it should be noted that capturing a franchise fee from the self-haulers that currently use the transfer stations (approximately 40% of the unincorporated tonnage) could be a potential source of income for the County. This amounts to about 32,000 tons per year.
- **Increasing diversion from the unincorporated areas.** While a full range of diversion services are offered at all of County facilities, it is likely that not all self-haulers take advantage (or full advantage) of these programs and dispose of



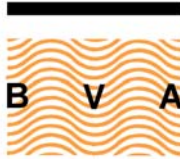
potentially divertible materials. Mandatory collection would include curbside recyclable and green waste collection programs, thus maximizing diversion. It is difficult to estimate the additional amount of diversion obtainable by implementation of mandatory collection but an increase of 0 to 2% should be reasonable.

- **Maintaining of the transfer station system.** The County maintains five transfer stations for the convenience of Sonoma County residents. Mandatory collection could reduce the number of transfer stations, or the hours of operation of transfer stations, thus reducing system operating costs. In 1999, two of the five transfer stations together represented only about one percent of the total waste stream disposed at the Central Landfill, and three of the five transfer facilities together represented less than 6 percent of the total waste stream.⁵ Recognizing this fact, some transfer stations may need to be closed or at least reduce hours of operation. Initiating mandatory collection can save System costs associated with transfer station operation.
- **Implementing partial mandatory collection.** Are there unincorporated areas in any of the collection areas with relatively high population density and current subscription rates well in excess of the average 60 percent participation rate? As discussed above, counties with mandatory collection tend to focus first, or exclusively on these more populated areas. A key question is to what degree would mandatory collection in any of these specific areas affect waste flows, and the incoming tonnages and cost of operation of specific County facilities? Note that if a city surrounded by such an unincorporated area does not have mandatory collection and many residents do not take service; implementing mandatory collection in the unincorporated area may be difficult unless the City also makes the change.

⁵ SCS Engineers, Sonoma County Solid Waste Management Alternatives Analysis Project, Final Report, Sonoma County Department of Transportation and Public Works, December 29, 2000, pg. 7.

APPENDIX E

Waste by Rail Haul Letter Report September 2005



**Brown, Vence &
Associates, Inc.**

Energy and Waste
Management Engineers
115 Sansome Street, Suite 800
San Francisco, CA 94104
t: 415.434.0900
f: 415.956.6220
www.brownvence.com

September 12, 2005

Susan R. Klassen, Deputy Director –
Transportation/Operations
Sonoma County Dept. of Transportation and Public Works
2300 County Center Drive, Suite B - 100
Santa Rosa, CA 95403

BVA job: J040107.00

Subject: Review of Rail Haul – Revised Draft

Dear Susan:

At the request of Sonoma County (County), Brown, Vence & Associates, Inc. (BVA) conducted a feasibility review of using rail haul in the County to transfer solid waste. The goal of this review was to ascertain the feasibility of waste by rail haul (WBR) as a possible alternative to long-haul truck transfer of waste for the County in BVA's current study, "Reassessment of the Long-Term Waste Management Plan."

The main tasks of the feasibility review included:

- Surveying existing communities in California/West Coast that use rail haul for waste transfer operations,
- Consideration of feasibility for rail haul in Sonoma County,
- Collecting information on infrastructure requirements including building and/or equipment needs at the rail spur for project implementation,
- Gathering information on both capital and operating costs to install, operate and maintain the system, and
- Utilizing the economic information gathered during the survey and analysis to project potential costs of rail haul for the County.

In addition, this economic information will be applied to the current pro forma model as an additional long-term out-haul scenario.



Survey of California/West Coast Communities & Rail Haul

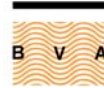
BVA conducted a survey of California communities that currently use, plan to use or have discontinued rail haul operations to transport solid waste. We were unable to find many communities in California that meet these criteria, so the survey was expanded to cover the West Coast, particularly the State of Washington, where most of the current WBR activities are occurring.

Current Rail Haul Operations

Seattle: The City of Seattle was among one of the first in the nation to implement a WBR system. For over 10 years Seattle has sent its approximately 445,000 tons per year (TPY) of waste by rail approximately 330 miles to the Columbia Ridge Landfill in Arlington, Oregon. Seattle's transfer stations operate 365 days per year, 24 hours per day. The City supplies the tractors, trailers/chassis and drivers for the trucking portion of the haul to the local rail yard. Union Pacific (UP) provides the infrastructure for rail transport.

The City owns and manages all aspects of two transfer stations; two other transfer stations are each owned by Waste Management and Allied. After sorting the incoming materials for recyclables at all four locations, the residual waste is loaded into compactors and compressed into 35 foot long bales weighing roughly 30 tons each. The compactor pushes (top loads) the bales into an open top (canvas covered for shipment) intermodal container that is mounted on the tractor's trailer chassis. The transfer vehicles then travel to the UP owned intermodal rail yard where a top pick crane off-loads the containers and places them onto the rail cars. Concurrently, while at the yard, empty returned containers are loaded onto the same truck for return to the transfer stations. Once trains arrive at Columbia Ridge Landfill another crane removes the containers and places them onto a drayage vehicle for the two mile trip to the tipping face of the landfill. The empty container is returned to the same train bound back to Seattle. The cost of Seattle's operations to transfer and dispose of their waste by rail is about \$44/ton.

Another jurisdiction near Seattle that ships WBR is the County of Kitsap, Washington. They also transfer approximately 250,000 TPY to the Columbia Ridge Landfill in Arlington, Oregon. According to the County's Public Works Department, they pay Waste Management approximately \$15 per ton for rail transport and \$17.50 for disposal at the landfill. The \$15 per ton figure is unreasonably low when compared to other rail haul



operations and should not be included in the analysis and decision making process for the County.

Two other counties near Seattle, Snohomish County and Island County also ship WBR. Snohomish County ships approximately 440,000 tons per year with transport costs at about \$25 per ton and disposal costs at about \$18 per ton. Island County ships approximately 35,000 tons per year with transport costs at about \$24 per ton and disposal costs at about \$21 per ton.

San Francisco: The Waste Solutions Group (WSG) has been operating a small transfer facility and shipping containers through the Port of San Francisco since 1993. WSG owns and operates two container lift machines in San Francisco (rated at 40-ton each) on behalf of the Port of San Francisco and other clients. Since 1993, WSG has shipped over 25,000 intermodal containers from the City & County of San Francisco. WSG also operates a rail haul company, LB Railco that operates the Port's short line railroad, delivering other rail shipments (flatcars, gondolas, bulktrainers, etc.) to rail-served businesses in San Francisco. WSG ships its waste to the ECDC Landfill in Carbon County, Utah. WSG mainly handles RICRA or Hazardous Waste (Class I & II) from San Francisco. WSG is also involved in operating several WBR facilities on the East Coast handling Municipal Solid Waste (MSW).

Rail Haul Operations in Planning Stage

Los Angeles: The Los Angeles County Waste Authority is in the process of developing a WBR system. Puente Hills, the County's largest landfill, accepting approximately 12,000 TPD is anticipated to reach capacity by 2013. The Authority is planning to use the Mesquite Landfill in Imperial County for disposal of their WBR. Mesquite will be developing the infrastructure to accept WBR by 2009.

The County plans to utilize the existing Puente Hills MRF to compact and load chassis mounted intermodal containers for rail haul. The County will acquire and conduct demolition activities in development of an intermodal rail yard on an adjacent 17 acre parcel. The site will be designed to handle two "unit trains" at a time. Each "unit train" has a capacity of around 4,000 tons. The estimated cost for the rail yard alone is approximately \$15-20 million. The estimated total project is estimated at about \$40 million. The County estimated that it will cost \$55 to \$60 per ton to transport and dispose of its waste using WBR to Mesquite Landfill at a rate of 4,000 TPD.

Discontinued Rail Haul Operations

Napa: The Napa Waste Management Authority (NWMA) began WBR operations in 1995 hauling an average of 600 TPD to Roosevelt Landfill in Washington. Due to the smaller



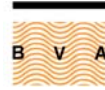
daily tonnage it was necessary to store up the waste in intermodal containers for 3-4 days in order that a more cost effective load could be shipped. Napa used a dedicated "unit train" to haul their loads. Due to the location of the transfer station, a short line rail operated by California Northern was used to transfer the train to Union Pacific Rail (UP) in Suisun City. UP then hauled the load to Klamath Falls, Oregon where the train was transferred to Burlington Northern for transfer to the landfill. According to Mr. Trent Cave, NWMA Director, when the system was designed, separate contracts with each rail line were written. Mr. Cave felt this led to many administrative problems and recommended having a 'blanket' contract agreement with all parties concerning the loading, hauling and unloading of the waste. Mr. Cave further stated that it is important to thoroughly check the serviceability of each of the rail lines that may be used. He also indicated that currently some rail services are at capacity shipping imports from China and don't want to be involved with WBR. Napa discontinued its WRB program due to the expansion of near-by landfills, lower rates, and favorable contractual terms from Allied Waste which purchased their rail haul company, Rabanco. At the time that NWMA was involved with WBR they were paying an all-inclusive rate of \$52.00 per ton. This rate covered the loading, hauling, unloading, and disposal of the waste.

Feasibility of WBR for Sonoma County

Sonoma County has historically been served by rail. Rail activities commenced in the late 1800's, being abandoned in the mid 1900's. The rail line though the County is currently inactive, however, the general infrastructure remains. According to the North Coast Rail Authority (NCRA), most of the track bed is in good shape throughout the area of concern. Under a state statute NCRA was created in 1990 with a goal towards establishing a public rail authority to attract funding to improve the rail lines in its jurisdiction. A recent \$8 million improvement was accomplished for the southern end of the line in Sonoma County. According to the NCRA several other improvements are needed including two bridges, one which spans the Petaluma River, crossing signal modernization, and some track bed repairs. NCRA anticipates these improvements being completed in one and one-half to two years. The existing rail infrastructure combined with the current rail improvement plans, makes the feasibility of WBR in Sonoma County potentially attractive.

Infrastructure Requirements for Sonoma County

The infrastructure requirements for development of WBR generally include the following five components:



- Transfer Station to collect, recover divertible materials, and load residual waste into intermodal containers or consolidate for loading gondola cars
- Local Rail Yard to load intermodal containers or gondola cars on spur track
- Rail Haul for transporting containers or gondola cars over rail lines to the remote rail yard
- Remote Rail Yard to off-load the containers or material in gondola cars to the landfill or transfer vehicles for haul to the landfill
- Landfill for disposal of residual solid waste

Each of these is discussed for Sonoma County below.

Transfer Station

Sonoma County currently operates four transfer stations and one landfill to handle transfer and disposal of their solid waste. The current estimated capacity by facility is included below:

- Central Disposal Site – approximately 525 TPD direct-hauled and 545 transferred into the landfill site
- Annapolis Transfer Station – approximately 20 TPD
- Guerneville Transfer Station - approximately 65 TPD
- Healdsburg Transfer Station – approximately 210 TPD
- Sonoma Transfer Station – approximately 250 TPD

In the case of rail haul, we have assumed that the Central Disposal Site would be closed and waste would be transferred through the current tipping facility at Central.

As discussed below, the NCRA, which represents rail activities for the counties of Sonoma, Mendocino, Humboldt and Marin, suggests siting the local rail yard near the town of Windsor. For this study, we have assumed that the most feasible and cost effective option for the County would be to develop and operate only a rail yard at this site for transferring containers, not developing a new Transfer Station near Windsor. This is due to the high costs involved with developing a new Transfer Station and the potential difficulty in siting and permitting a solid waste facility. In addition, the County



already operates a system of transfer stations and it would not make sense to double-handle materials.

The County would need to acquire top-pick hoists to load the containers onto flat bed transfer vehicles at the transfer stations. We have assumed that there will only be three transfer facilities needing these improvements; Central Tipping Building, Sonoma Transfer Station, and Healdsburg Transfer Station. Because of the volume of waste generated, Annapolis Transfer Station and the Guerneville Transfer Station should direct their waste to Central for loading into intermodal containers.

The transfer station improvements needed by the County would include:

Central Disposal Site

- Top-pick hoists – 1
- Transfer vehicles (flat-bed type) - 6
- Site improvements

Healdsburg Transfer Station

- Top-pick hoists – 1
- Transfer vehicles (flat-bed type) - 3
- Site improvements

Sonoma Transfer Station

- Top-pick hoists – 1
- Transfer vehicles (flat-bed type) - 4
- Site improvements

Local Rail Yard

As discussed above, the NCRA has investigated the rail lines in Sonoma County and believes that the most feasible location to site a rail yard is **near** the Town of Windsor. The County will need locate the most appropriate site for these activities, but for purposes of this report, a location **near** the Town of Windsor was assumed. The rail yard would basically be an off-loading location, where the intermodal containers would be



lifted from the flat-bed transfer truck vehicles and placed onto the rail cars. The rail yard would need to be developed including three run-around tracks (5,000 linear ft), a top-pick hoist, yard donkey (vehicle for moving trailers and other equipment around the yard) and transfer trailers and an office trailer. As discussed below, NCRA indicates that there could be grant money available to help with these development costs at the rail yard.

Rail Haul

Sonoma County may need to involve three rail companies in order to move its MSW from Windsor to a disposal site in either, Nevada, Oregon, Washington, or Utah: 1) North Coast Rail Authority (NCRA), 2) California Northern (CN) and 3) Union Pacific (UP). NCRA operates the “team track” between Windsor and Napa Junction (also referred to as Shellville or Lombard). Here at Napa Junction, NCRA’s “team track” meets up with UP’s rail line. As UP does not take connections at this junction, and NCRA does not operate past this junction, CN will need to gain a right-of-way to operate over UP tracks and conduct the train to Fairfield, where UP can take over the haul to the distant disposal site. NCRA indicates that a contracting company would handle the rail transport from Windsor to the landfill. They would handle the contracts and operations for all three rail companies to assure efficient rail transport. The junction of the NCRA line with that of the Union Pacific Line at for Napa Junction is shown in the map below.

According to NCRA, currently there is a possibility of \$60 million in grant monies for capital improvements. If the County does decide on WBR, grant monies may be appropriated in a more timely fashion shortening the schedule for completion of the improvement projects. NCRA also indicated that grant monies could possibly be used toward the capital improvements for the rail yard, or intermodal transfer station.

We have analyzed three separate locations for delivery of waste by rail. These include rail haul from near Windsor to: 1) ECDC Landfill in Carbon City, UT, 2) Columbia Ridge Landfill in Arlington, OR, and 3) Lockwood or Russell Pass landfills in western Nevada. No economic analysis of the Klickitat County, WA site was performed as it is located along the same corridor as the Arlington, OR site, only further from Sonoma County, thus its cost would higher.

The distance/time involved for rail travel is directly proportional to the amount of intermodal containers and rail cars needed. Each intermodal container is assumed to hold approximately 23 tons of waste. Each rail car can hold about 92 tons of waste or four intermodal containers. Assuming a County tonnage of approximately 1,100 TPD, the County would need to fill about 48 to 50 containers per day. Each rail car will hold four containers, thus approximately 12 cars on average could be filled daily by Sonoma County waste. Additional containers will be acquired to handle daily peaks from

September 12, 2005

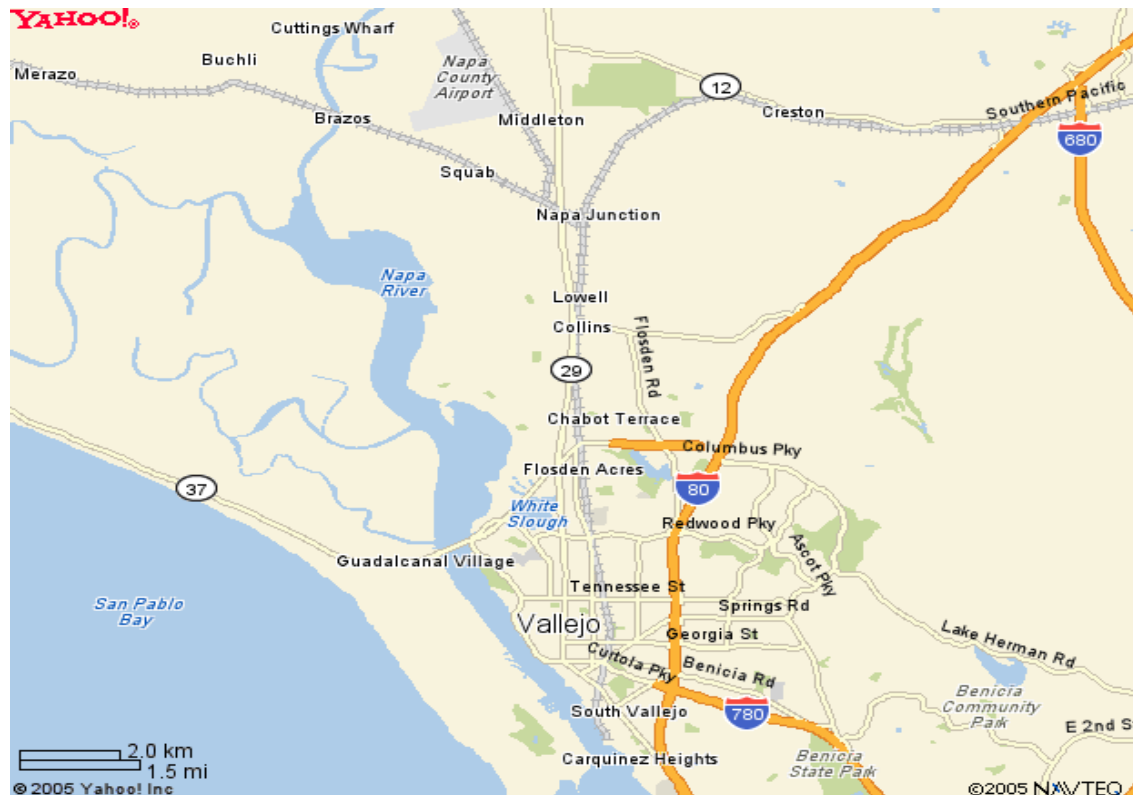
Susan R. Klassen

Page 8 of 18



fluctuations in the waste stream. Using information gathered from the Waste Solutions Group (WSG), an operator of several WBR facilities, the containers could be moved locally or every other day to the UP operator in Fairfield.

Map Showing Junction of NCRA Line and Union Pacific Line



Assuming approximately 1,100 TPD: the ECDC Landfill in Carbon City, UT, would require approximately 168 cars and 700 containers; the Columbia Ridge Landfill in Arlington, OR would require approximately 144 cars and 600 containers; the Lockwood or Russell Pass landfills in western Nevada would require approximately 120 cars and 500 containers, and 4) hauling locally would require approximately 24 cars and 100 containers, depending on the exact location of the landfill.

Remote Rail Yard

Some type of remote rail yard will be required at or near any destination landfill site. Three of the five landfills listed below, currently have some form of remote rail yard at or near their landfill. The ECDC Landfill in Carbon City, Utah, and the Columbia Ridge Landfill in Arlington, Oregon, currently have rail access to the actual landfill site. The

September 12, 2005

Susan R. Klassen

Page 9 of 18



Roosevelt Regional Landfill in Klickitat County, Washington has a rail yard with a 3.5 mile private connector road to the landfill. The County could choose one of these landfills with already developed rail yard infrastructures; however, the County may be able to negotiate a more economically feasible agreement for the development of the rail yard into a disposal tip fee at one of the other sites (i.e., the Russell Pass Landfill in Fallon, NV has offered a very low disposal rate that could allow development of the remote rail yard for an all-in cost potentially lower than the landfills with existing rail infrastructures). If a new remote rail yard is needed, the infrastructure discussed for the local rail yard would also be required at this yard.

Landfill

Sonoma County has several options available for the landfilling of waste from WBR. As mentioned above, the Columbia Ridge Landfill in Gilliam County, Oregon, and the ECDC Landfill in East Carbon City, Utah, are two landfills that can currently accept rail directly to the landfill site. The Roosevelt Regional Landfill in Klickitat County, Washington operates a rail yard with a short 3.5 mile transfer vehicle route via a private road to the landfill face. The other two landfills listed below, the Lockwood Landfill in Sparks, Nevada and the Russell Pass Landfill in Fallon, Nevada require development of a remote rail yard and transport from this rail yard to the landfill. The five most non-local feasible "western states" landfills that could accept WBR from Sonoma are listed below:

Roosevelt Regional Landfill (Allied /Rabanco)

Location: Klickitat County, WA.

Contact: Pete Keller 206-332-7795, Leslie Whiteman 206-332-7711

Permitted: Yes

Tipping Fee: disposal \$20.00 (approximate)

Capacity (TPD): 14,000 TPD

Current TPD Accepted: 8,000 TPD

Total Capacity: 217 million tons

Projected Closure: 65 years

Rail Line(s): Burlington Northern / Santa Fe

On Rail Line: No, requires a short 3.5 mi haul by truck on a private road owned by the landfill. This is the landfill that was used by Napa County. The MSW from Napa was shipped using three rail lines, UP, NCR and BN.

Columbia Ridge Landfill

Location: Arlington, OR.

Contact: Will Spears, Site Manager 503-331-2239, 541-454-2030

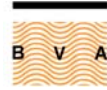
Permitted: Yes, currently 700 acres of 2,036

Tipping Fee: Varies (some deals made between \$17 and \$20/ton)

September 12, 2005

Susan R. Klassen

Page 10 of 18



Capacity (TPD): No limit currently

Current TPD Accepted: 15,000 TPD

Total Capacity: 191 million cy

Projected Closure: 55 years

Rail Line(s): Union Pacific

On Rail Line: Yes, recent improvements bought rail line directly to landfill.

ECDC Landfill (Allied)

Location: East Carbon City, UT.

Contact: Richard McMullen 801-253-1111 (435-888-4451)

Permitted: Yes; UT 9422

Tipping Fee: low to mid teens

Capacity (TPD): No limit currently

Current TPD Accepted: 6,000 TPD

Total Capacity: 130 million tons

Projected Closure: 300 years

Rail Line(s): Union Pacific

On Rail Line: Yes

Russell Pass Landfill

Location: Fallon, NV.

Contact: Landfill 775-427-2052, City Clerk 775-423-5104, Larry White City Engineer

Permitted: Yes

Tipping Fee: Negotiable, standard fees and contract fees

Capacity (TPD): No limit currently

Current TPD Accepted: 20-30 TPD

Total Capacity: 17.5 million tons

Projected Closure: 25 years

Rail Line(s): Union Pacific.

On Rail Line: No, WBR has never been taken to this facility. The main UP line is approximately 30 miles away. There is another rail line closer, but contact was not sure who owned it or if it is currently usable.

Lockwood Landfill

Location: Sparks, NV.

Contact: Mark Franch 775-329-8822 x 813, or Gregg Martinelli 775-322-0878

Permitted: Yes

Tipping Fee: \$13.47 /ton negotiable

Capacity (TPD): No limit currently

Current TPD Accepted: 9,000 TPD



Remaining Capacity: 42 million tons

Projected Closure: No projections, planning to expand.

Rail Line(s): Union Pacific

On Rail Line: No, must be trucked 9 miles. Would have to commit to a long-term contract with adequate volume to support the cost of putting in an intermodal yard at spur line either in Sparks (10 miles out), or Patrick (3-4 miles out).

According to the survey information gathered for these five landfills, sufficient capacity appears to be available to handle the County's average and peak loads of approximately 1,100 TPD and 1,600 TPD, respectively.

Economic Assessment

The pricing structure of WBR is determined by three main factors: required capital investment, rail operating cost, and disposal cost. Each of these is discussed below.

Capital Investment

WBR operations require capital investment at the front-end Transfer Station sites, at the local rail yard and sometimes at the remote rail yard, as most landfills that accept waste by rail have the remote rail yard infrastructure in place. In discussions with rail operators and review of Seattle's WBR contract, it appears likely that a rail operator would take possession of the full intermodal containers for transport to the landfill at the local rail yard, delivering the waste to the remote rail yard site. The capital investment potentially required by the County is discussed below.

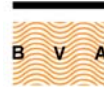
Transfer Station

The following infrastructure improvements and associated estimated capital expenditures at the County's Transfer Station sites would probably be required:

- 3 Top-pick hoists – \$250,000 each = \$750,000
- 13 Transfer vehicles (flat-bed type) – \$120,000 each = \$1,560,000
- Minor site improvements at 3 sites (none may be required) - \$25,000 each = \$75,000

Total Transfer Station costs are estimated to be approximately \$2,385,000.

Local Rail Yard/Rail Transport/Remote Rail Yard



Rail operating cost infrastructure improvements at the local rail yard would include three run-around tracks (5,000 linear ft), a top-pick hoist, yard donkey and transfer trailers and an office trailer. These improvements would cost roughly \$1.5 million. These improvement costs would also be required for a landfill that does not currently operate a remote rail yard.

For rail transport, a large number of flat-bed railcars and intermodal containers would be required. As discussed above for the four landfill options, assuming approximately 1,100 TPD: the ECDC Landfill in Carbon City, UT, would require approximately 168 cars and 700 containers; the Columbia Ridge Landfill in Arlington, OR would require approximately 144 cars and 600 containers; the Lockwood or Russell Pass landfills in western Nevada would require approximately 120 cars and 500 containers, and 4) hauling locally would require approximately 24 cars and 100 containers, depending on the location of the landfill. The cost for each rail car is approximately \$100,000 and the cost for each intermodal container is about \$10,000. The capital costs for rail transport for each of the options is shown in Table 1 below (this table also includes the capital cost details for both the Transfer and local/remote rail components).

Rail Operating Cost

As described in the Capital Investment section above, the Transfer, local/remote rail yards and rail transport all have associated operating costs.

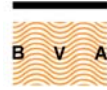
Transfer

It was assumed that there would be no additional cost for the actual transportation from the three County transfer stations to the local rail yard in Windsor. It was assumed that existing costs for transfer to Central would approximately equate to transfer costs to Windsor and thus net out the potential difference.

Local Rail Yard/Rail Transport/Remote Rail Yard

Operations at the local and/or remote rail yards would require three operators and one clerical/secretary each. In addition certain maintenance costs would be required at each yard. These costs are shown in Table 2 below.

Assuming approximately 372,200 TPY, approximately 4,046 rail car trips carrying 92 ton each would be required. The cost per rail car trip is estimated based on distance/time of travel to the site roundtrip. The cost of rail haul to Utah is estimated at \$2,800 per car; the cost of rail haul to Nevada is estimated at \$2,200 per car; the cost of rail haul to



Oregon is estimated at \$2,500 per car and for short-haul to a local landfill at approximately \$600 per car. Again, these costs are shown in Table 2 below.

In addition, we understand that the Northwestern California communities in Mendocino and Humboldt counties may be interested in WBR, thus potentially lowering costs through “economies of scale.”

Disposal Cost

From discussions with the landfill operators at the sites we have analyzed, we have estimated disposal costs as:

- Columbia Ridge Landfill - assumed at \$18.50 per ton for disposal
- Russell Pass Landfill - \$7 per ton disposal plus transport from the remote rail yard to the landfill at approximately \$6 per ton or a total disposal cost of \$13 per ton.
- ECDC Landfill – assumed at \$14 per ton for disposal

Total Cost

To estimate the total costs for each of the alternatives, the capital costs were amortized, assuming a 5% finance charge, 5.5% interest rate, and a term of 20 years, then added to the rail operating and disposal costs as shown in Table 3 below. The total annual costs were then divided by 372,200 tons per year to calculate the per ton rail tipping fee.

September 12, 2005

Susan R. Klassen

Page 14 of 18

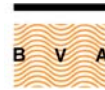
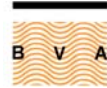


Table 1 | Rail Capital Investment Costs

	<u>Quantity</u>	<u>Cost/Item</u>	<u>Total Costs</u>
<u>Transfer MRF</u>			
Top-Pick Hoists	3 ea	\$ 250,000	\$ 750,000
Truck/Trailers	13 ea	\$ 120,000	\$ 1,560,000
Site Improvements	3 ea	\$ 25,000	\$ 75,000
Subtotal			\$ 2,385,000
<u>Local Rail Yard</u>			
Track	5000 ft	\$ 100	\$ 500,000
Paving	20000 sy	\$ 20	\$ 400,000
Office Trailer	1 ea	\$ 50,000	\$ 50,000
Forklift	1 ea	\$ 50,000	\$ 50,000
Yard Goat	1 ea	\$ 75,000	\$ 75,000
Trailers	2 ea	\$ 50,000	\$ 100,000
Trucks	1 ea	\$ 70,000	\$ 70,000
Top-Pick Hoists	1 ea	\$ 250,000	\$ 250,000
			\$ 1,495,000
<u>Rail Transport</u>			
<u>Utah</u>			
Intermodal Containers	700 ea	\$ 10,000	\$ 7,000,000
Rail Cars	168 ea	\$ 100,000	\$ 16,800,000
Subtotal			\$ 23,800,000
<u>Nevada</u>			
Intermodal Containers	500 ea	\$ 10,000	\$ 5,000,000
Rail Cars	120 ea	\$ 100,000	\$ 12,000,000
Subtotal			\$ 17,000,000
<u>Oregon</u>			
Intermodal Containers	600 ea	\$ 10,000	\$ 6,000,000
Rail Cars	144 ea	\$ 100,000	\$ 14,400,000
Subtotal			\$ 20,400,000
<u>Remote Rail Yard</u>			
Track	5000 ft	\$ 100	\$ 500,000
Paving	20000 sy	\$ 20	\$ 400,000
Office Trailer	1 ea	\$ 50,000	\$ 50,000
Forklift	1 ea	\$ 50,000	\$ 50,000
Yard Goat	1 ea	\$ 75,000	\$ 75,000
Trailers	2 ea	\$ 50,000	\$ 100,000
Trucks	1 ea	\$ 70,000	\$ 70,000
Top-Pick Hoists	1 ea	\$ 250,000	\$ 250,000
			\$ 1,495,000
<u>Total Capital</u>			
<u>Utah</u>			
Total Cost			\$ 29,175,000
Amortized Amt (5.5% interest, 20 years, 5% finance charge)			\$2,563,412
<u>Nevada</u>			
Total Cost			\$ 22,375,000
Amortized Amt (5.5% interest, 20 years, 5% finance charge)			\$1,965,941
<u>Oregon</u>			
Total Cost			\$ 25,775,000
Amortized Amt (5.5% interest, 20 years, 5% finance charge)			\$2,264,676

**Table 2 | Rail Operating Costs**

	<u>Quantity</u>	<u>Cost/Item</u>	<u>Total Costs</u>
<u>Transfer MRF</u>			
Use Existing	0 ea	\$ -	\$ -
Subtotal			\$ -
<u>Local Rail Yard</u>			
Operators	3 ea	\$ 80,000	\$ 240,000
Clerical/Secretary	1 ea	\$ 40,000	\$ 40,000
Maintenance	1 ea	\$ 100,000	\$ 100,000
Subtotal			\$ 380,000
<u>Rail Transport</u>			
<i>Utah</i>			
Haul	4046 cars	\$ 2,800	\$ 11,327,826
Subtotal			\$ 11,327,826
<i>Nevada</i>			
Haul	4046 cars	\$ 2,200	\$ 8,900,435
Subtotal			\$ 8,900,435
<i>Oregon</i>			
Haul	4046 cars	\$ 2,500	\$ 10,114,130
Subtotal			\$ 10,114,130
<u>Remote Rail Yard</u>			
Operators	3 ea	\$ 80,000	\$ 240,000
Clerical/Secretary	1 ea	\$ 40,000	\$ 40,000
Maintenance	1 ea	\$ 100,000	\$ 100,000
Subtotal			\$ 380,000
<u>Total Operating</u>			
<i>Utah</i>			
Total Cost			\$ 11,707,826
<i>Nevada</i>			
Total Cost			\$ 9,660,435
<i>Oregon</i>			
Total Cost			\$ 10,494,130

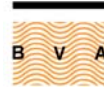


Table 3 | Total Rail Costs

<u>Items</u>	<u>Cost</u>
<i>Utah</i>	
Amortized Capital Cost	\$2,563,412
Operating Cost	\$ 11,707,826
Disposal Cost	\$ 5,210,800
Total Annual Cost	\$19,482,038
Tipping Fee	\$52
<i>Nevada</i>	
Amortized Capital Cost	\$1,965,941
Operating Cost	\$ 9,660,435
Disposal Cost	\$ 4,838,600
Total Annual Cost	\$16,464,976
Tipping Fee	\$44
<i>Oregon</i>	
Amortized Capital Cost	\$2,264,676
Operating Cost	\$ 10,494,130
Disposal Cost	\$ 6,885,700
Total Annual Cost	\$19,644,507
Tipping Fee	\$53

The total cost to the County for rail haul is estimated at approximately \$44 to \$53 per ton depending on the landfill option. The lowest cost option at approximately \$44 per ton was for delivery to the Russell Pass Landfill in Fallon, Nevada at \$44 per ton. This estimate is only about \$3 per ton or about 7 to 8% higher than the current average cost of \$41 per ton for highway vehicle haul and disposal that the County currently has under contract. These costs are pretty comparable, as the level of contingency alone may make up the difference between the two figures. Table 4 includes a comparison of the rail haul options vs. out-haul via highway transport vehicle.

Other Factors

In making the decision on whether to implement a WBR program, other potentially favorable factors such benefits to the environmental and the community need to be considered. If a WBR program can be implemented in the County, local businesses and the public could benefit through uses for transport and freight. We understand that it is not economically feasible for these individual businesses or the public to finance the needed infrastructure improvements for rail. However, if WBR can be economically developed, the WBR system could be utilized for more expansive purposes.



Table 4 | Option Comparison

<u>Hauling Option</u>	<u>Estimated Cost per Ton</u>
Highway Transfer Vehicle	\$41/ton
Rail Haul to Utah	\$52/ton
Rail Haul to Nevada	\$44/ton
Rail Haul to Oregon	\$53/ton

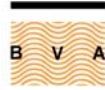
Other environmental impacts include:

- Reduced congestion on roads – assuming disposal of 372,200 tons, approximately 16,200 large truck round trips to the landfill could be eliminated annually; however local traffic could be increased waiting for trains within Sonoma County
- Reduced accidents – according to the National Center for Statistics & Analysis, approximately one out of nine accidents involved large trucks
- Reduced noise, except for those residents located close to the rail lines
- Reduced road maintenance costs
- Reduced air emissions - rail produces less than one tenth of the carbon monoxide; around one twentieth of the nitrogen oxide; less than 9% of the fine particulates and around 10% of the volatile organic compounds compared to highway vehicles
- Reduced energy consumption - approximately 1/10 that of highway transport
- Reduce global warming - Every ton of freight carried by rail produces at least 80% less carbon dioxide than by road. At present nearly 40% of carbon dioxide emissions from road transport come from large trucks and buses.

September 12, 2005

Susan R. Klassen

Page 18 of 18



Conclusions

Considering that the costs for rail transport vs. highway vehicle transport are fairly comparable (within 7 to 8%) with the added benefits discussed above, WBR should definitely be considered as a long-term out-haul option. This option should be studied in more detail as the County moves ahead with potential future out-haul plans and included as another alternative during the procurement process for handling the County's future waste stream.

If you have any questions, please call me at (415) 434-0900 x125.

Very truly yours,

BROWN, VENCE & ASSOCIATES

Michael Greenberg

Michael G. Greenberg, P.E.

Senior Vice President

Cc: Michael Brown, BVA
Jim Madden, BVA

APPENDIX F

Economic Pro Forms

Sonoma County
Economic Analysis - Full System Tonnage
Scenario 1: Outhaul for 5 Years then Re-open Central with Normal Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	980,980	\$	1,029,911	\$	1,081,283	\$	1,135,218	\$	1,191,842	\$	1,251,291	\$	1,313,706	\$	1,379,233	\$	1,448,030	\$	1,520,257	\$	1,596,088
Education/Diversion/Planning	\$	420,420	\$	441,391	\$	463,407	\$	486,522	\$	510,790	\$	536,268	\$	563,017	\$	591,100	\$	620,584	\$	651,539	\$	684,038
County Diversion Costs	\$	615,491	\$	640,111	\$	665,715	\$	692,344	\$	720,037	\$	748,839	\$	778,792	\$	809,944	\$	842,342	\$	876,035	\$	911,077
	\$	2,016,891	\$	2,111,412	\$	2,210,405	\$	2,314,083	\$	2,422,669	\$	2,536,398	\$	2,655,515	\$	2,780,278	\$	2,910,956	\$	3,047,832	\$	3,191,202
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building - Additional Operations	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,																		

Calculated Tipping Fee	\$	61.39	\$	78.20	\$	81.74	\$	85.63	\$	89.15	\$	93.12	\$	83.88	\$	86.11	\$	88.42	\$	90.82	\$	89.14	\$	91.77	\$	94.50	\$	97.34	\$	100.28	\$	103.34	\$	108.90	\$	112.26	\$	137.23	\$	136.56	
Closure/Post-Closure Expenses																																									
Central Closure	\$	1,585,000							\$	3,257,086	\$	3,387,369	\$	3,522,864	\$	3,663,779	\$	3,810,330	\$	3,962,743	\$	4,121,253	\$	4,286,103	\$	4,457,547	\$	4,635,849	\$	4,821,283	\$	5,014,134	\$	5,214,699	\$	5,423,287	\$	-			
Central Post Closure									\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254	
Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	4,861,459	\$	5,055,917	\$	5,258,154	\$	5,468,480	\$	5,687,219	\$	5,914,708	\$	6,151,296	\$	6,397,348	\$	6,653,242	\$	6,919,371	\$	7,196,146	\$	7,483,992	\$	7,783,352	\$	8,094,686	\$	2,778,254	
Calculated Tipping Fee	\$	70.22	\$	82.44	\$	86.11	\$	90.13	\$	93.79	\$	105.58	\$	96.72	\$	99.34	\$	102.04	\$	104.86	\$	103.60	\$	106.67	\$	109.85	\$	113.15	\$	116.57	\$	120.12	\$	126.18	\$	130.07	\$	155.58	\$	142.79	
Proposed New Zero Waste/Diversion Programs																																									
Mandatory Source Separation	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
C&D Diversion	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
Public Education	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668	
Commercial Outreach & Tech Assistance	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
Market Development	\$	-	\$	216,320	\$	224,973	\$	233,972	\$	243,331	\$	253,064	\$	263,186	\$	273,714	\$	284,662	\$	296,049	\$	307,891	\$	320,206	\$	333,015	\$	346,335	\$	360,189	\$	374,596	\$	389,580	\$	405,163	\$	421,370	\$	438,225	
Zero Waste R&D	\$	-	\$	60,570	\$	62,992	\$	65,512	\$	68,133	\$	70,858	\$	73,692	\$	76,640	\$	79,705	\$	82,894	\$	86,209	\$	89,658	\$	93,244	\$	96,974	\$	100,853	\$	104,887	\$	109,082	\$	113,446	\$	117,984	\$	122,703	
LTF Programs	\$	-	\$	378,560	\$	393,702	\$	409,450	\$	425,829	\$	442,862	\$	460,576	\$	478,999	\$	498,159	\$	518,085	\$	538,809	\$	560,361	\$	582,776	\$	606,087	\$	630,330	\$	655,543	\$	681,765	\$	709,036	\$	737,397	\$	766,893	
Subtotal Zero Waste Programs	\$	-	\$	1,142,170	\$	1,187,856	\$	1,235,371	\$	1,284,785	\$	1,336,177	\$	1,389,624	\$	1,445,209	\$	1,503,017	\$	1,563,138	\$	1,625,663	\$	1,690,690	\$	1,758,318	\$	1,828,650	\$	1,901,796	\$	1,977,868	\$	2,056,983	\$	2,139,262	\$	2,224,833	\$	2,313,826	
Calculated Tipping Fee	\$	70.22	\$	85.98	\$	89.75	\$	93.88	\$	97.65	\$	109.00	\$	100.24	\$	102.97	\$	105.79	\$	108.71	\$	107.57	\$	110.76	\$	114.07	\$	117.49	\$	121.04	\$	124.73	\$	130.94	\$	134.96	\$	160.62	\$	147.99	
Total Expenses Less Revenues w/ Zero Waste	\$	23,092,885	\$	27,791,114	\$	29,286,766	\$	30,925,532	\$	32,473,433	\$	42,535,077	\$	39,488,812	\$	40,948,338	\$	42,468,371	\$	44,057,078	\$	44,007,966	\$	45,743,156	\$	47,556,103	\$	49,450,287	\$	51,429,341	\$	53,497,064	\$	56,693,708	\$	58,992,307	\$	70,874,508	\$	65,921,074	
Net Present Value (NPV) of Total Expenses Less Revenues	\$	518,112,384																																							
Total Expenses Less Revenues w/o Zero Waste	\$	23,092,885	\$	26,648,944	\$	28,098,910	\$	29,690,161	\$	31,188,648	\$	41,198,900	\$	38,099,188	\$	39,503,129	\$	40,965,354	\$	42,493,940	\$	42,382,303	\$	44,052,466	\$	45,797,786	\$	47,621,637	\$	49,527,545	\$	51,519,196	\$	54,636,725	\$	56,853,045	\$	68,649,675	\$	63,607,248	
Net Present Value (NPV) of Total Expenses Less Revenues	\$	500,028,223																																							
Operating Reserves/Fund Balance																																									
Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Operating Reserve Interest	\$	\$0	\$	\$30,559	\$	\$53,073	\$	\$80,024	\$	\$122,025	\$	\$125,076	\$	\$128,202	\$	\$131,408	\$	\$134,693	\$	\$138,060	\$	\$141,512	\$	\$145,049	\$	\$148,676	\$	\$152,392	\$	\$156,202	\$	\$160,107	\$	\$164,110	\$	\$168,213	\$	\$172,418	\$	\$176,728	
Operating Reserve	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868	
Year End - Fund Balance	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868	
TONNAGE FLOW																																									
Amount of Waste Received at County Facilities		328,867		323,242		326,313		329,413		332,542		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447	
Amount to Central		-		-		-		-		-		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447	
Total System Waste		372,200		375,736		379,305		382,909		386,546		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Hauled Out of County		328,867		323,242		326,313		329,413		332,542		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Direct Haul		52,000		52,494		52,993		53,496		54,004																															
Assumptions																																									
Annual General Escalation Rate		4.0%																																							
Annual Out of County Haul Fee Escalation Rate		2.0%																																							
Annual Waste Escalation Rate		0.95%																																							
Annual Revenue Increase		1.5%																																							
Annual Average County Interest Rate		5.0%																																							

Sonoma County
Economic Analysis - Full System Tonnage
Scenario 2: Outhaul for 5 Years then Re-open Central with Robust Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	980,980	\$	1,029,911	\$	1,081,283	\$	1,135,218	\$	1,191,842	\$	1,251,291	\$	1,313,706	\$	1,379,233	\$	1,448,030	\$	1,520,257	\$	1,596,088
Education/Diversion/Planning	\$	420,420	\$	441,391	\$	463,407	\$	486,522	\$	510,790	\$	536,268	\$	563,017	\$	591,100	\$	620,584	\$	651,539	\$	684,038
County Diversion Costs	\$	615,491	\$	640,111	\$	665,715	\$	692,344	\$	720,037	\$	748,839	\$	778,792	\$	809,944	\$	842,342	\$	876,035	\$	911,077
	\$	2,016,891	\$	2,111,412	\$	2,210,405	\$	2,314,083	\$	2,422,669	\$	2,536,398	\$	2,655,515	\$	2,780,278	\$	2,910,956	\$	3,047,832	\$	3,191,202
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building - Additional Operations	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945														

Calculated Tipping Fee	\$	61.39	\$	78.20	\$	81.74	\$	85.63	\$	89.15	\$	99.12	\$	89.83	\$	92.00	\$	94.26	\$	96.60	\$	94.86	\$	97.44	\$	100.12	\$	102.90	\$	105.80	\$	108.80	\$	114.31	\$	117.62	\$	142.54	\$	142.02	
Closure/Post-Closure Expenses																																									
Central Closure	\$	1,585,000								\$	3,257,086	\$	3,387,369	\$	3,522,864	\$	3,663,779	\$	3,810,330	\$	3,962,743	\$	4,121,253	\$	4,286,103	\$	4,457,547	\$	4,635,849	\$	4,821,283	\$	5,014,134	\$	5,214,699	\$	5,423,287	\$	-		
Central Post Closure										\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254	
Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	4,861,459	\$	5,055,917	\$	5,258,154	\$	5,468,480	\$	5,687,219	\$	5,914,708	\$	6,151,296	\$	6,397,348	\$	6,653,242	\$	6,919,371	\$	7,196,146	\$	7,483,992	\$	7,783,352	\$	8,094,686	\$	2,778,254	
Calculated Tipping Fee	\$	70.22	\$	82.44	\$	86.11	\$	90.13	\$	93.79	\$	111.58	\$	102.66	\$	105.23	\$	107.88	\$	110.64	\$	109.32	\$	112.34	\$	115.47	\$	118.71	\$	122.08	\$	125.58	\$	131.59	\$	135.43	\$	160.89	\$	148.26	
Proposed New Zero Waste/Diversion Programs																																									
Mandatory Source Separation	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
C&D Diversion	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
Public Education	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668	
Commercial Outreach & Tech Assistance	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112	
Market Development	\$	-	\$	216,320	\$	224,973	\$	233,972	\$	243,331	\$	253,064	\$	263,186	\$	273,714	\$	284,662	\$	296,049	\$	307,891	\$	320,206	\$	333,015	\$	346,335	\$	360,189	\$	374,596	\$	389,580	\$	405,163	\$	421,370	\$	438,225	
Zero Waste R&D	\$	-	\$	60,570	\$	62,992	\$	65,512	\$	68,133	\$	70,858	\$	73,692	\$	76,640	\$	79,705	\$	82,894	\$	86,209	\$	89,658	\$	93,244	\$	96,974	\$	100,853	\$	104,887	\$	109,082	\$	113,446	\$	117,984	\$	122,703	
LTF Programs	\$	-	\$	378,560	\$	393,702	\$	409,450	\$	425,829	\$	442,862	\$	460,576	\$	478,999	\$	498,159	\$	518,085	\$	538,809	\$	560,361	\$	582,776	\$	606,087	\$	630,330	\$	655,543	\$	681,765	\$	709,036	\$	737,397	\$	766,893	
Subtotal Zero Waste Programs	\$	-	\$	1,142,170	\$	1,187,856	\$	1,235,371	\$	1,284,785	\$	1,336,177	\$	1,389,624	\$	1,445,209	\$	1,503,017	\$	1,563,138	\$	1,625,663	\$	1,690,690	\$	1,758,318	\$	1,828,650	\$	1,901,796	\$	1,977,868	\$	2,056,983	\$	2,139,262	\$	2,224,833	\$	2,313,826	
Calculated Tipping Fee	\$	70.22	\$	85.98	\$	89.75	\$	93.88	\$	97.65	\$	115.01	\$	106.19	\$	108.86	\$	111.62	\$	114.49	\$	113.30	\$	116.43	\$	119.68	\$	123.06	\$	126.56	\$	130.19	\$	136.34	\$	140.32	\$	165.93	\$	153.45	
Total Expenses Less Revenues w/ Zero Waste	\$	23,092,885	\$	27,791,114	\$	29,286,766	\$	30,925,532	\$	32,473,433	\$	44,877,184	\$	41,830,919	\$	43,290,444	\$	44,810,478	\$	46,399,184	\$	46,350,073	\$	48,085,262	\$	49,898,210	\$	51,792,394	\$	53,771,448	\$	55,839,171	\$	59,035,815	\$	61,334,414	\$	73,216,615	\$	68,354,092	
Net Present Value (NPV) of Total Expenses Less Revenues	\$	537,194,376																																							
Total Expenses Less Revenues w/o Zero Waste	\$	23,092,885	\$	26,648,944	\$	28,098,910	\$	29,690,161	\$	31,188,648	\$	43,541,007	\$	40,441,295	\$	41,845,236	\$	43,307,461	\$	44,836,046	\$	44,724,410	\$	46,394,572	\$	48,139,892	\$	49,963,743	\$	51,869,652	\$	53,861,303	\$	56,978,832	\$	59,195,152	\$	70,991,782	\$	66,040,266	
Net Present Value (NPV) of Total Expenses Less Revenues	\$	519,110,216																																							
Operating Reserves/Fund Balance																																									
Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Operating Reserve Interest	\$	0	\$	30,559	\$	53,073	\$	80,024	\$	122,025	\$	125,076	\$	128,202	\$	131,408	\$	134,693	\$	138,060	\$	141,512	\$	145,049	\$	148,676	\$	152,392	\$	156,202	\$	160,107	\$	164,110	\$	168,213	\$	172,418	\$	176,728	
Operating Reserve	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868	
Year End - Fund Balance	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868	
TONNAGE FLOW																																									
Amount of Waste Received at County Facilities		328,867		323,242		326,313		329,413		332,542		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447	
Amount to Central		-		-		-		-		-		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447	
Total System Waste		372,200		375,736		379,305		382,909		386,546		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Hauled Out of County		328,867		323,242		326,313		329,413		332,542		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Direct Haul		52,000		52,494		52,993		53,496		54,004																															
Assumptions																																									
Annual General Escalation Rate		4.0%																																							
Annual Out of County Haul Fee Escalation Rate		2.0%																																							
Annual Waste Escalation Rate		0.95%																																							
Annual Revenue Increase		1.5%																																							
Annual Average County Interest Rate		5.0%																																							

Sonoma County
Economic Analysis - Full System Tonnage
Scenario 3: Close Central Landfill and Outhaul

	Year Fiscal Year	1 2005-06	2 2006-07	3 2007-08	4 2008-09	5 2009-10	6 2010-11	7 2011-12	8 2012-13	9 2013-14	10 2014-15	11 2015-16	12 2016-17	13 2017-18	14 2018-19	15 2019-20	16 2020-21	17 2021-22	18 2022-23	19 2023-24	20 2024-25	
EXPENSES																						
<u>Diversion & Waste Reduction</u>																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	980,980	\$	1,029,911	\$	1,081,283	\$	1,135,218	\$	1,191,842	\$	1,251,291	\$	1,313,706	\$	1,379,233	\$	1,448,030	\$	1,520,257	\$	1,596,088
Education/Diversion/Planning	\$	420,420	\$	441,391	\$	463,407	\$	486,522	\$	510,790	\$	536,268	\$	563,017	\$	591,100	\$	620,584	\$	651,539	\$	684,038
County Diversion Costs	\$	615,491	\$	640,111	\$	665,715	\$	692,344	\$	720,037	\$	748,839	\$	778,792	\$	809,944	\$	842,342	\$	876,035	\$	911,077
	\$	2,016,891	\$	2,111,412	\$	2,210,405	\$	2,314,083	\$	2,422,669	\$	2,536,398	\$	2,655,515	\$	2,780,278	\$	2,910,956	\$	3,047,832	\$	3,191,202
Total Diversion & Waste Reduction Expenses																						
<u>Transfer Stations & Out of County Disposal</u>																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building - Additional Operations	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1

Calculated Tipping Fee	\$	61.40	\$	78.20	\$	81.74	\$	82.84	\$	86.28	\$	74.78	\$	73.32	\$	75.11	\$	76.93	\$	78.81	\$	76.56	\$	78.57	\$	80.64	\$	82.77	\$	84.94	\$	87.17	\$	89.46	\$	91.81	\$	94.22	\$	96.69
Closure/Post-Closure Expenses																																								
Central Closure	\$	1,585,000							\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212
Central Post Closure									\$	2,772,221	\$	2,883,110	\$	2,998,434	\$	3,118,372	\$	3,243,107	\$	3,372,831	\$	3,507,744	\$	3,648,054	\$	3,793,976	\$	3,945,735	\$	4,103,565	\$	4,267,707	\$	4,438,415	\$	4,615,952	\$	4,800,590		
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254
Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	6,269,806	\$	6,444,870	\$	6,626,936	\$	6,816,285	\$	7,013,208	\$	7,218,008	\$	7,430,999	\$	7,652,511	\$	7,882,883	\$	8,122,470	\$	8,371,640	\$	8,630,777	\$	8,900,280	\$	9,180,562	\$	9,472,056
Calculated Tipping Fee	\$	70.23	\$	82.44	\$	86.11	\$	87.35	\$	90.92	\$	90.85	\$	89.68	\$	91.77	\$	93.91	\$	96.12	\$	94.20	\$	96.57	\$	99.00	\$	101.50	\$	104.06	\$	106.69	\$	109.40	\$	112.17	\$	115.03	\$	117.96
Proposed New Zero Waste/Diversion Programs																																								
Mandatory Source Separation	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
C&D Diversion	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
Public Education	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668
Commercial Outreach & Tech Assistance	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
Market Development	\$	-	\$	216,320	\$	224,973	\$	233,972	\$	243,331	\$	253,064	\$	263,186	\$	273,714	\$	284,662	\$	296,049	\$	307,891	\$	320,206	\$	333,015	\$	346,335	\$	360,189	\$	374,596	\$	389,580	\$	405,163	\$	421,370	\$	438,225
Zero Waste R&D	\$	-	\$	60,570	\$	62,992	\$	65,512	\$	68,133	\$	70,858	\$	73,692	\$	76,640	\$	79,705	\$	82,894	\$	86,209	\$	89,658	\$	93,244	\$	96,974	\$	100,853	\$	104,887	\$	109,082	\$	113,446	\$	117,984	\$	122,703
LTF Programs	\$	-	\$	378,560	\$	393,702	\$	409,450	\$	425,829	\$	442,862	\$	460,576	\$	478,999	\$	498,159	\$	518,085	\$	538,809	\$	560,361	\$	582,776	\$	606,087	\$	630,330	\$	655,543	\$	681,765	\$	709,036	\$	737,397	\$	766,893
Subtotal Zero Waste Programs	\$	-	\$	1,142,170	\$	1,187,856	\$	1,235,371	\$	1,284,785	\$	1,336,177	\$	1,389,624	\$	1,445,209	\$	1,503,017	\$	1,563,138	\$	1,625,663	\$	1,690,690	\$	1,758,318	\$	1,828,650	\$	1,901,796	\$	1,977,868	\$	2,056,983	\$	2,139,262	\$	2,224,833	\$	2,313,826
Calculated Tipping Fee	\$	70.23	\$	85.98	\$	89.75	\$	91.10	\$	94.79	\$	94.28	\$	93.21	\$	95.41	\$	97.66	\$	99.97	\$	98.17	\$	100.66	\$	103.22	\$	105.84	\$	108.54	\$	111.30	\$	114.15	\$	117.07	\$	120.07	\$	123.15
Total Expenses Less Revenues w/ Zero Waste	\$	23,095,923	\$	27,791,114	\$	29,286,766	\$	30,008,231	\$	31,520,037	\$	36,787,898	\$	36,715,920	\$	37,940,254	\$	39,204,264	\$	40,514,828	\$	40,164,098	\$	41,572,758	\$	43,032,756	\$	44,545,975	\$	46,114,369	\$	47,739,966	\$	49,424,866	\$	51,171,251	\$	52,981,383	\$	54,857,606
Net Present Value (NPV) of Total Expenses Less Revenues	\$471,728,337																																							
Total Expenses Less Revenues w/o Zero Waste	\$	23,095,923	\$	26,648,944	\$	28,098,910	\$	28,772,861	\$	30,235,251	\$	35,451,721	\$	35,326,296	\$	36,495,045	\$	37,701,247	\$	38,951,690	\$	38,538,434	\$	39,882,068	\$	41,274,438	\$	42,717,325	\$	44,212,573	\$	45,762,097	\$	47,367,883	\$	49,031,989	\$	50,756,550	\$	52,543,780
Net Present Value (NPV) of Total Expenses Less Revenues	\$453,644,176																																							
Operating Reserves/Fund Balance																																								
Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Operating Reserve Interest	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0	\$	0		
Operating Reserve	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
Year End - Fund Balance	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
TONNAGE FLOW																																								
Amount of Waste Received at County Facilities	328,867	323,242	326,313	329,413	332,542	390,219	393,926	397,668	401,446	405,260	409,110	412,996	416,920	420,880	424,879	428,915	432,990	437,103	441,256	445,447																				
Amount to Central	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-																				
Total System Waste	372,200	375,736	379,305	382,909	386,546	390,219	393,926	397,668	401,446	405,260	409,110	412,996	416,920	420,880	424,879	428,915	432,990	437,103	441,256	445,447																				
Amount Hauled Out of County	328,867	323,242	326,313	329,413	332,542	390,219	393,926	397,668	401,446	405,260	409,110	412,996	416,920	420,880	424,879	428,915	432,990	437,103	441,256	445,447																				
Amount Direct Haul	52,000	52,494	52,993	53,496	54,004																																			
Assumptions																																								
Annual General Escalation Rate	4.0%																																							
Annual Out of County Haul Fee Escalation Rate	2.0%																																							
Annual Waste Escalation Rate	0.95%																																							
Annual Revenue Increase	1.5%																																							

Sonoma County
Economic Analysis - Full System Tonnage
Scenario 4: Close Central Landfill and Outhaul via Rail

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	980,980	\$	1,029,911	\$	1,081,283	\$	1,135,218	\$	1,191,842	\$	1,251,291	\$	1,313,706	\$	1,379,233	\$	1,448,030	\$	1,520,257	\$	1,596,088
Education/Diversion/Planning	\$	420,420	\$	441,391	\$	463,407	\$	486,522	\$	510,790	\$	536,268	\$	563,017	\$	591,100	\$	620,584	\$	651,539	\$	684,038
County Diversion Costs	\$	615,491	\$	640,111	\$	665,715	\$	692,344	\$	720,037	\$	748,839	\$	778,792	\$	809,944	\$	842,342	\$	876,035	\$	911,077
	\$	2,016,891	\$	2,111,412	\$	2,210,405	\$	2,314,083	\$	2,422,669	\$	2,536,398	\$	2,655,515	\$	2,780,278	\$	2,910,956	\$	3,047,832	\$	3,191,202
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	653,723	\$	679,872	\$	707,067	\$	735,350	\$	764,764	\$	795,354	\$	827,168	\$	860,255	\$	894,665	\$	930,452	\$	967,670
Central Tipping Building - Additional Operations	\$	1,990,414	\$	2,070,031	\$	2,152,832	\$	2,238,945	\$	2,328,503	\$	2,421,643	\$	2,518,509	\$	2,619,249	\$	2,724,019	\$	2,832,980	\$	2,946,299
Annapolis	\$	179,691	\$	186,879	\$	194,354	\$	202,128	\$	210,213	\$	218,622	\$	227,367	\$	236,461	\$	245,920	\$	255,757	\$	265,987
Guerneville	\$	389,147	\$	404,713	\$	420,902	\$	437,738	\$	455,247	\$	473,457	\$	492,395	\$	512,091	\$	532,575	\$	553,878	\$	576,033
Healdsburg	\$	826,800	\$	859,872	\$	894,267	\$	930,038	\$	967,239	\$	1,005,929	\$	1,046,166	\$	1,088,012	\$	1,131,533	\$	1,176,794	\$	1,223,866
Sonoma	\$	679,078	\$	706,242	\$	734,491	\$	763,871	\$	794,426	\$	826,203	\$	859,251	\$	893,621	\$	929,366	\$	966,540	\$	1,005,202
	\$	3,428,442	\$	3,545,059	\$	3,676,879	\$	3,823,902	\$	3,987,973	\$	4,169,922	\$	4,369,921	\$	4,589,920	\$	4,831,919	\$	5,098,918	\$	5,386,917
Transport to Central																						
Central Tipping Building	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	185,493	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Out of County Rail Haul and Disposal																						
	\$	11,447,141	\$	13,866,206	\$	14,277,894	\$	14,701,804	\$	15,138,301	\$	19,444,979	\$	20,022,301	\$	20,616,763	\$	21,228,875	\$	21,859,160	\$	22,508,158
Capital Improvements																						
Central Tipping Building	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis		\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Guerneville		\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Healdsburg		\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Sonoma	\$	159,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	375,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Administration (20% of total)																						
	\$	575,201	\$	598,209	\$	622,137	\$	647,023	\$	672,904	\$	699,820	\$	727,813	\$	756,925	\$	787,202	\$	818,690	\$	851,438
	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000	\$	1,000,000
Total Transfer Station & Out of County Disposal Expenses																						
	\$	17,242,189	\$	19,426,103	\$	20,060,187	\$	20,715,389	\$	21,392,429	\$	27,196,877	\$	26,786,766	\$	27,651,807	\$	28,545,320	\$	29,468,263	\$	30,421,626
Disposal																						
Central Landfill																						
Operations	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Environmental Compliance	\$	4,261,622	\$	4,432,086	\$	4,609,370	\$	4,793,745	\$	4,985,494	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	-
Administration & Engineering (30% of total)	\$	862,802	\$	897,314	\$	933,206	\$	970,534	\$	1,009,356	\$	1,049,730	\$	1,091,719	\$	1,135,388	\$	1,180,803	\$	1,228,036	\$	1,277,157
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	6,037,625	\$	6,049,171	\$	6,142,582	\$	6,255,387	\$	6,379,261	\$	6,514,281	\$	6,660,157	\$	6,817,145	\$	6,985,144	\$	7,166,144	\$	7,353,144
Total Disposal Expenses																						
	\$	10,948,244	\$	7,039,371	\$	7,249,457	\$	7,475,585	\$	7,702,621	\$	2,760,521	\$	2,800,180	\$	2,847,344	\$	2,891,479	\$	2,937,906	\$	1,277,157
Other																						
Administration (50% of total)	\$	1,438,003	\$	1,495,523	\$	1,555,344	\$	1,617,557	\$	1,682,260	\$	1,749,550	\$	1,819,532	\$	1,892,313	\$	1,968,006	\$	2,046,726	\$	2,128,595
Litter Control	\$	307,909	\$	320,226	\$	333,035	\$	346,356	\$	360,210	\$	374,619	\$	389,603	\$	405,187	\$	421,395	\$	438,251	\$	455,781
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	429,796	\$	446,988	\$	464,867	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	5,479,550	\$	3,512,736	\$	4,263,245	\$	4,070,513	\$	4,767,334	\$	3,294,027	\$	3,425,788	\$	3,562,820	\$	3,705,332	\$	3,853,546	\$	4,007,688
Total Other Expenses																						
	\$	5,479,550	\$	3,512,736	\$	4,263,245	\$	4,070,513	\$	4,767,334	\$	3,294,027	\$	3,425,788	\$	3,562,820	\$	3,705,332	\$	3,853,546	\$	4,007,688
TOTAL EXPENSES																						
	\$	35,686,874	\$	32,089,623	\$	33,783,295	\$	34,575,570	\$	36,285,053	\$	35,787,823	\$	35,668,249	\$	36,842,248	\$	38,053,088	\$	39,307,546	\$	38,897,673
REVENUES																						
Incoming Revenues	\$	3,242,000	\$	3,290,630	\$	3,339,989	\$	3,390,089	\$	3,440,941	\$	3,492,555	\$	3,544,943	\$	3,598,117	\$	3,652,089	\$	3,706,870	\$	3,762,473
JPA Revenues	\$	1,401,400	\$	1,471,302	\$	1,544,690	\$	1,621,740	\$	1,702,632	\$	1,787,559	\$	1,876,723	\$	1,970,334	\$	2,068,614	\$	2,171,796	\$	2,280,125
First Year Use of Fund Balance	\$	9,861,953																				
Direct Haul Revenues	\$	989,275	\$	2,050,171	\$	2,225,986	\$	2,274,214	\$	2,448,895												
West Expansion - Rock Quarry Royalties																						
TOTAL REVENUES																						
	\$	15,494,628	\$	6,812,103	\$	7,110,666	\$	7,286,042	\$	7,592,468	\$	5,280,114	\$	5,421,666	\$	5,568,451	\$	5,720,703	\$	5,878,667	\$	6,042,599
NET EXPENSES																						
	\$	20,192,246	\$	25,277,520	\$	26,672,628	\$	27,289,528	\$	28,692,585	\$	30,507,709	\$	30,246,584	\$	31,273,797	\$	32,332,385	\$	33,428,880	\$	32,855,074

Calculated Tipping Fee	\$	61.40	\$	78.20	\$	81.74	\$	82.84	\$	86.28	\$	78.18	\$	76.78	\$	78.64	\$	80.54	\$	82.49	\$	80.31	\$	82.40	\$	84.55	\$	86.75	\$	89.00	\$	91.32	\$	93.69	\$	96.12	\$	98.62	\$	101.18
Closure/Post-Closure Expenses																																								
Central Closure	\$	1,585,000								\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	
Central Post Closure										\$	2,772,221	\$	2,883,110	\$	2,998,434	\$	3,118,372	\$	3,243,107	\$	3,372,831	\$	3,507,744	\$	3,648,054	\$	3,793,976	\$	3,945,735	\$	4,103,565	\$	4,267,707	\$	4,438,415	\$	4,615,952	\$	4,800,590	
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254
Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	6,269,806	\$	6,444,870	\$	6,626,936	\$	6,816,285	\$	7,013,208	\$	7,218,008	\$	7,430,999	\$	7,652,511	\$	7,882,883	\$	8,122,470	\$	8,371,640	\$	8,630,777	\$	8,900,280	\$	9,180,562	\$	9,472,056
Calculated Tipping Fee	\$	70.23	\$	82.44	\$	86.11	\$	87.35	\$	90.92	\$	94.25	\$	93.14	\$	95.31	\$	97.52	\$	99.79	\$	97.95	\$	100.39	\$	102.90	\$	105.48	\$	108.12	\$	110.83	\$	113.62	\$	116.48	\$	119.42	\$	122.44
Proposed New Zero Waste/Diversion Programs																																								
Mandatory Source Separation	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
C&D Diversion	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
Public Education	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668
Commercial Outreach & Tech Assistance	\$	-	\$	108,160	\$	112,486	\$	116,986	\$	121,665	\$	126,532	\$	131,593	\$	136,857	\$	142,331	\$	148,024	\$	153,945	\$	160,103	\$	166,507	\$	173,168	\$	180,094	\$	187,298	\$	194,790	\$	202,582	\$	210,685	\$	219,112
Market Development	\$	-	\$	216,320	\$	224,973	\$	233,972	\$	243,331	\$	253,064	\$	263,186	\$	273,714	\$	284,662	\$	296,049	\$	307,891	\$	320,206	\$	333,015	\$	346,335	\$	360,189	\$	374,596	\$	389,580	\$	405,163	\$	421,370	\$	438,225
Zero Waste R&D	\$	-	\$	60,570	\$	62,992	\$	65,512	\$	68,133	\$	70,858	\$	73,692	\$	76,640	\$	79,705	\$	82,894	\$	86,209	\$	89,658	\$	93,244	\$	96,974	\$	100,853	\$	104,887	\$	109,082	\$	113,446	\$	117,984	\$	122,703
LTF Programs	\$	-	\$	378,560	\$	393,702	\$	409,450	\$	425,829	\$	442,862	\$	460,576	\$	478,999	\$	498,159	\$	518,085	\$	538,809	\$	560,361	\$	582,776	\$	606,087	\$	630,330	\$	655,543	\$	681,765	\$	709,036	\$	737,397	\$	766,893
Subtotal Zero Waste Programs	\$	-	\$	1,142,170	\$	1,187,856	\$	1,235,371	\$	1,284,785	\$	1,336,177	\$	1,389,624	\$	1,445,209	\$	1,503,017	\$	1,563,138	\$	1,625,663	\$	1,690,690	\$	1,758,318	\$	1,828,650	\$	1,901,796	\$	1,977,868	\$	2,056,983	\$	2,139,262	\$	2,224,833	\$	2,313,826
Calculated Tipping Fee	\$	70.23	\$	85.98	\$	89.75	\$	91.10	\$	94.79	\$	97.67	\$	96.67	\$	98.94	\$	101.26	\$	103.65	\$	101.93	\$	104.49	\$	107.12	\$	109.82	\$	112.60	\$	115.45	\$	118.37	\$	121.38	\$	124.46	\$	127.63
Total Expenses Less Revenues w/ Zero Waste	\$	23,095,923	\$	27,791,114	\$	29,286,766	\$	30,008,231	\$	31,520,037	\$	38,113,692	\$	38,081,077	\$	39,345,942	\$	40,651,687	\$	42,005,226	\$	41,698,745	\$	43,152,969	\$	44,659,883	\$	46,221,412	\$	47,839,550	\$	49,516,367	\$	51,254,009	\$	53,054,701	\$	54,920,752	\$	56,854,555
Net Present Value (NPV) of Total Expenses Less Revenues	\$484,717,980																																							
Total Expenses Less Revenues w/o Zero Waste	\$	23,095,923	\$	26,648,944	\$	28,098,910	\$	28,772,861	\$	30,235,251	\$	36,777,515	\$	36,691,453	\$	37,900,733	\$	39,148,670	\$	40,442,088	\$	40,073,082	\$	41,462,279	\$	42,901,566	\$	44,392,761	\$	45,937,753	\$	47,538,498	\$	49,197,026	\$	50,915,439	\$	52,695,919	\$	54,540,729
Net Present Value (NPV) of Total Expenses Less Revenues	\$466,633,820																																							
Operating Reserves/Fund Balance																																								
Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Operating Reserve Interest	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0	\$	\$0		
Operating Reserve	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
Year End - Fund Balance	\$	972,342	\$	1,222,342	\$	2,092,342	\$	3,117,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342	\$	4,717,342
TONNAGE FLOW																																								
Amount of Waste Received at County Facilities		328,867		323,242		326,313		329,413		332,542		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447
Amount to Central		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-		
Total System Waste		372,200		375,736		379,305		382,909		386,546		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447
Amount Hauled Out of County		328,867		323,242		326,313		329,413		332,542		390,219		393,926		397,668		401,446		405,260		409,110		412,996		416,920		420,880		424,879		428,915		432,990		437,103		441,256		445,447
Amount Direct Haul		52,000		52,494		52,993		53,496		54,004																														
Assumptions																																								
Annual General Escalation Rate		4.0%																																						
Annual Out of County Haul Fee Escalation Rate		2.0%																																						
Annual Waste Escalation Rate		0.95%																																						
Annual Revenue Increase		1.5%																																						

Sonoma County
Economic Analysis - 80% of System Tonnage
Scenario 1: Outhaul for 5 Years then Re-open Central with Normal Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	882,882	\$	926,920	\$	973,155	\$	1,021,696	\$	1,072,658	\$	1,126,162	\$	1,182,335	\$	1,241,310	\$	1,303,227	\$	1,368,232	\$	1,436,479
Education/Diversion/Planning	\$	378,378	\$	397,251	\$	417,066	\$	437,870	\$	459,711	\$	482,641	\$	506,715	\$	531,990	\$	558,526	\$	586,385	\$	615,634
County Diversion Costs	\$	553,942	\$	576,099	\$	599,143	\$	623,109	\$	648,034	\$	673,955	\$	700,913	\$	728,950	\$	758,108	\$	788,432	\$	819,969
	\$	1,815,202	\$	1,900,271	\$	1,989,365	\$	2,082,675	\$	2,180,402	\$	2,282,758	\$	2,389,963	\$	2,502,250	\$	2,619,860	\$	2,743,048	\$	2,872,082
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,3																

Closure/Post-Closure Expenses																																									
Central Closure	\$	1,585,000						\$	2,533,289	\$	2,634,621	\$	2,740,005	\$	2,849,606	\$	2,963,590	\$	3,082,133	\$	3,205,419	\$	3,333,636	\$	3,466,981	\$	3,605,660	\$	3,749,887	\$	3,899,882	\$	4,055,877	\$	4,218,112	\$	4,386,837				
Central Post Closure								\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-				
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254	
Subtotal Closure/Post-Closure Expenses		\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	4,137,662	\$	4,303,168	\$	4,475,295	\$	4,654,307	\$	4,840,479	\$	5,034,098	\$	5,235,462	\$	5,444,880	\$	5,662,676	\$	5,889,183	\$	6,124,750	\$	6,369,740	\$	6,624,530	\$	6,889,511	\$	7,165,091
Calculated Tipping Fee		\$	74.53	\$	87.89	\$	92.13	\$	94.90	\$	99.06	\$	106.58	\$	109.49	\$	114.68	\$	117.88	\$	132.51	\$	114.59	\$	118.08	\$	121.69	\$	125.44	\$	129.33	\$	133.36	\$	137.54	\$	141.88	\$	146.37	\$	151.02
Proposed New Zero Waste/Diversion Programs																																									
Mandatory Source Separation	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
C&D Diversion	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
Public Education	\$	-	\$	146,016	\$	151,857	\$	157,931	\$	164,248	\$	170,818	\$	177,651	\$	184,757	\$	192,147	\$	199,833	\$	207,826	\$	216,139	\$	224,785	\$	233,776	\$	243,127	\$	252,852	\$	262,967	\$	273,485	\$	284,425	\$	295,802	
Commercial Outreach & Tech Assistance	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
Market Development	\$	-	\$	194,688	\$	202,476	\$	210,575	\$	218,998	\$	227,757	\$	236,868	\$	246,342	\$	256,196	\$	266,444	\$	277,102	\$	288,186	\$	299,713	\$	311,702	\$	324,170	\$	337,137	\$	350,622	\$	364,647	\$	379,233	\$	394,402	
Zero Waste R&D	\$	-	\$	54,513	\$	56,693	\$	58,961	\$	61,319	\$	63,772	\$	66,323	\$	68,976	\$	71,735	\$	74,604	\$	77,588	\$	80,692	\$	83,920	\$	87,276	\$	90,768	\$	94,398	\$	98,174	\$	102,101	\$	106,185	\$	110,433	
LTF Programs	\$	-	\$	340,704	\$	354,332	\$	368,505	\$	383,246	\$	398,575	\$	414,519	\$	431,099	\$	448,343	\$	466,277	\$	484,928	\$	504,325	\$	524,498	\$	545,478	\$	567,297	\$	589,989	\$	613,589	\$	638,132	\$	663,657	\$	690,204	
Subtotal Zero Waste Programs		\$	-	\$	1,027,953	\$	1,069,071	\$	1,111,834	\$	1,156,307	\$	1,202,559	\$	1,250,662	\$	1,300,688	\$	1,352,716	\$	1,406,824	\$	1,463,097	\$	1,521,621	\$	1,582,486	\$	1,645,785	\$	1,711,617	\$	1,780,081	\$	1,851,285	\$	1,925,336	\$	2,002,349	\$	2,082,443
Calculated Tipping Fee		\$	74.53	\$	91.87	\$	96.23	\$	99.12	\$	103.41	\$	110.43	\$	113.46	\$	118.77	\$	122.10	\$	136.85	\$	119.06	\$	122.68	\$	126.44	\$	130.33	\$	134.37	\$	138.55	\$	142.89	\$	147.38	\$	152.04	\$	156.87
Total Expenses Less Revenues w/ Zero Waste		\$	19,607,417	\$	23,755,907	\$	25,120,003	\$	26,121,573	\$	27,509,634	\$	34,473,042	\$	35,754,498	\$	37,783,870	\$	39,211,949	\$	44,368,302	\$	38,966,731	\$	40,533,869	\$	42,171,666	\$	43,883,298	\$	45,672,082	\$	47,541,489	\$	49,495,143	\$	51,536,835	\$	53,670,526	\$	55,900,358
Net Present Value (NPV) of Total Expenses Less Revenues		\$453,135,530																																							
Total Expenses Less Revenues w/o Zero Waste		\$	19,607,417	\$	22,727,954	\$	24,050,932	\$	25,009,739	\$	26,353,328	\$	33,270,483	\$	34,503,837	\$	36,483,182	\$	37,859,234	\$	42,961,478	\$	37,503,634	\$	39,012,248	\$	40,589,180	\$	42,237,512	\$	43,960,466	\$	45,761,407	\$	47,643,858	\$	49,611,499	\$	51,668,177	\$	53,817,915
Net Present Value (NPV) of Total Expenses Less Revenues		\$436,859,786																																							
Operating Reserves/Fund Balance																																									
Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	
Operating Reserve Interest	\$	\$0	\$	\$30,559	\$	\$53,073	\$	\$80,024	\$	\$122,025	\$	\$125,076	\$	\$128,202	\$	\$131,408	\$	\$134,693	\$	\$138,060	\$	\$141,512	\$	\$145,049	\$	\$148,676	\$	\$152,392	\$	\$156,202	\$	\$160,107	\$	\$164,110	\$	\$168,213	\$	\$172,418	\$	\$176,728	
Operating Reserve	\$	\$972,342	\$	\$1,252,901	\$	\$2,175,973	\$	\$3,280,997	\$	\$5,003,022	\$	\$5,128,098	\$	\$5,256,300	\$	\$5,387,708	\$	\$5,522,401	\$	\$5,660,461	\$	\$5,801,972	\$	\$5,947,021	\$	\$6,095,697	\$	\$6,248,089	\$	\$6,404,292	\$	\$6,564,399	\$	\$6,728,509	\$	\$6,896,722	\$	\$7,069,140	\$	\$7,245,868	
Year End - Fund Balance	\$	\$972,342	\$	\$1,252,901	\$	\$2,175,973	\$	\$3,280,997	\$	\$5,003,022	\$	\$5,128,098	\$	\$5,256,300	\$	\$5,387,708	\$	\$5,522,401	\$	\$5,660,461	\$	\$5,801,972	\$	\$5,947,021	\$	\$6,095,697	\$	\$6,248,089	\$	\$6,404,292	\$	\$6,564,399	\$	\$6,728,509	\$	\$6,896,722	\$	\$7,069,140	\$	\$7,245,868	
TONNAGE FLOW																																									
Amount of Waste Received at County Facilities		263,093		258,594		261,050		263,530		266,034		312,175		315,141		318,134		321,157		324,208		327,288		330,397		333,536		336,704		339,903		343,132		346,392		349,682		353,004		356,358	
Amount to Central		-		-		-		-		-		312,175		315,141		318,134		321,157		324,208		327,288		330,397		333,536		336,704		339,903		343,132		346,392		349,682		353,004		356,358	
Total System Waste		297,760		300,589		303,444		306,327		309,237		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Hauled Out of County		263,093		258,594		261,050		263,530		266,034		-		-		-		-		-		-		-		-		-		-		-		-		-		-		-	
Amount Direct Haul		41,600		41,995		42,394		42,797		43,203																															
Assumptions																																									
Annual General Escalation Rate		4.0%																																							
Annual Out of County Haul Fee Escalation Rate		2.0%																																							
Annual Waste Escalation Rate		0.95%																																							
Annual Revenue Increase		1.5%																																							
Annual Average County Interest Rate		5.0%																																							

Sonoma County
Economic Analysis - 80% of System Tonnage
Scenario 2: Outhaul for 5 Years then Re-open Central with Robust Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	882,882	\$	926,920	\$	973,155	\$	1,021,696	\$	1,072,658	\$	1,126,162	\$	1,182,335	\$	1,241,310	\$	1,303,227	\$	1,368,232	\$	1,436,479
Education/Diversion/Planning	\$	378,378	\$	397,251	\$	417,066	\$	437,870	\$	459,711	\$	482,641	\$	506,715	\$	531,990	\$	558,526	\$	586,385	\$	615,634
County Diversion Costs	\$	553,942	\$	576,099	\$	599,143	\$	623,109	\$	648,034	\$	673,955	\$	700,913	\$	728,950	\$	758,108	\$	788,432	\$	819,969
	\$	1,815,202	\$	1,900,271	\$	1,989,365	\$	2,082,675	\$	2,180,402	\$	2,282,758	\$	2,389,963	\$	2,502,250	\$	2,619,860	\$	2,743,048	\$	2,872,082
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,3																

Closure/Post-Closure Expenses																																									
Central Closure	\$	1,585,000						\$	2,533,289	\$	2,634,621	\$	2,740,005	\$	2,849,606	\$	2,963,590	\$	3,082,133	\$	3,205,419	\$	3,333,636	\$	3,466,981	\$	3,605,660	\$	3,749,887	\$	3,899,882	\$	4,055,877	\$	4,218,112	\$	4,386,837				
Central Post Closure								\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-		
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254	
Subtotal Closure/Post-Closure Expenses		\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	4,137,662	\$	4,303,168	\$	4,475,295	\$	4,654,307	\$	4,840,479	\$	5,034,098	\$	5,235,462	\$	5,444,880	\$	5,662,676	\$	5,889,183	\$	6,124,750	\$	6,369,740	\$	6,624,530	\$	6,889,511	\$	7,165,091
Calculated Tipping Fee		\$	74.53	\$	87.89	\$	92.13	\$	94.90	\$	99.06	\$	112.88	\$	115.74	\$	120.87	\$	124.01	\$	138.59	\$	120.61	\$	124.04	\$	127.60	\$	131.29	\$	135.13	\$	139.10	\$	143.23	\$	147.51	\$	151.94	\$	156.55
Proposed New Zero Waste/Diversion Programs																																									
Mandatory Source Separation	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
C&D Diversion	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
Public Education	\$	-	\$	146,016	\$	151,857	\$	157,931	\$	164,248	\$	170,818	\$	177,651	\$	184,757	\$	192,147	\$	199,833	\$	207,826	\$	216,139	\$	224,785	\$	233,776	\$	243,127	\$	252,852	\$	262,967	\$	273,485	\$	284,425	\$	295,802	
Commercial Outreach & Tech Assistance	\$	-	\$	97,344	\$	101,238	\$	105,287	\$	109,499	\$	113,879	\$	118,434	\$	123,171	\$	128,098	\$	133,222	\$	138,551	\$	144,093	\$	149,857	\$	155,851	\$	162,085	\$	168,568	\$	175,311	\$	182,323	\$	189,616	\$	197,201	
Market Development	\$	-	\$	194,688	\$	202,476	\$	210,575	\$	218,998	\$	227,757	\$	236,868	\$	246,342	\$	256,196	\$	266,444	\$	277,102	\$	288,186	\$	299,713	\$	311,702	\$	324,170	\$	337,137	\$	350,622	\$	364,647	\$	379,233	\$	394,402	
Zero Waste R&D	\$	-	\$	54,513	\$	56,693	\$	58,961	\$	61,319	\$	63,772	\$	66,323	\$	68,976	\$	71,735	\$	74,604	\$	77,588	\$	80,692	\$	83,920	\$	87,276	\$	90,768	\$	94,398	\$	98,174	\$	102,101	\$	106,185	\$	110,433	
LTF Programs	\$	-	\$	340,704	\$	354,332	\$	368,505	\$	383,246	\$	398,575	\$	414,519	\$	431,099	\$	448,343	\$	466,277	\$	484,928	\$	504,325	\$	524,498	\$	545,478	\$	567,297	\$	589,989	\$	613,589	\$	638,132	\$	663,657	\$	690,204	
Subtotal Zero Waste Programs		\$	-	\$	1,027,953	\$	1,069,071	\$	1,111,834	\$	1,156,307	\$	1,202,559	\$	1,250,662	\$	1,300,688	\$	1,352,716	\$	1,406,824	\$	1,463,097	\$	1,521,621	\$	1,582,486	\$	1,645,785	\$	1,711,617	\$	1,780,081	\$	1,851,285	\$	1,925,336	\$	2,002,349	\$	2,082,443
Calculated Tipping Fee		\$	74.53	\$	91.87	\$	96.23	\$	99.12	\$	103.41	\$	116.74	\$	119.70	\$	124.96	\$	128.23	\$	142.92	\$	125.08	\$	128.64	\$	132.34	\$	136.18	\$	140.16	\$	144.29	\$	148.57	\$	153.01	\$	157.62	\$	162.39
Total Expenses Less Revenues w/ Zero Waste		\$	19,607,417	\$	23,755,907	\$	25,120,003	\$	26,121,573	\$	27,509,634	\$	36,442,035	\$	37,723,492	\$	39,752,864	\$	41,180,943	\$	46,337,296	\$	40,935,725	\$	42,502,862	\$	44,140,660	\$	45,852,291	\$	47,641,076	\$	49,510,482	\$	51,464,136	\$	53,505,828	\$	55,639,520	\$	57,869,352
Net Present Value (NPV) of Total Expenses Less Revenues		\$469,148,831																																							
Total Expenses Less Revenues w/o Zero Waste		\$	19,607,417	\$	22,727,954	\$	24,050,932	\$	25,009,739	\$	26,353,328	\$	35,239,476	\$	36,472,830	\$	38,452,176	\$	39,828,228	\$	44,930,472	\$	39,472,628	\$	40,981,241	\$	42,558,174	\$	44,206,506	\$	45,929,459	\$	47,730,401	\$	49,612,852	\$	51,580,492	\$	53,637,170	\$	55,786,909
Net Present Value (NPV) of Total Expenses Less Revenues		\$452,873,086																																							

Operating Reserves/Fund Balance																				
Year Beginning - Fund Balance	\$ 9,861,953	\$972,342	\$1,252,901	\$2,175,973	\$3,280,997	\$5,003,022	\$5,128,098	\$5,256,300	\$5,387,708	\$5,522,401	\$5,660,461	\$5,801,972	\$5,947,021	\$6,095,697	\$6,248,089	\$6,404,292	\$6,564,399	\$6,728,509	\$6,896,722	\$7,069,140
Operating Reserve Deposit	\$ 972,342	\$ 250,000	\$ 870,000	\$ 1,025,000	\$ 1,600,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Operating Reserve Interest	\$0	\$30,559	\$53,073	\$80,024	\$122,025	\$125,076	\$128,202	\$131,408	\$134,693	\$138,060	\$141,512	\$145,049	\$148,676	\$152,392	\$156,202	\$160,107	\$164,110	\$168,213	\$172,418	\$176,728
Operating Reserve	\$972,342	\$1,252,901	\$2,175,973	\$3,280,997	\$5,003,022	\$5,128,098	\$5,256,300	\$5,387,708	\$5,522,401	\$5,660,461	\$5,801,972	\$5,947,021	\$6,095,697	\$6,248,089	\$6,404,292	\$6,564,399	\$6,728,509	\$6,896,722	\$7,069,140	\$7,245,868
Year End - Fund Balance	\$972,342	\$1,252,901	\$2,175,973	\$3,280,997	\$5,003,022	\$5,128,098	\$5,256,300	\$5,387,708	\$5,522,401	\$5,660,461	\$5,801,972	\$5,947,021	\$6,095,697	\$6,248,089	\$6,404,292	\$6,564,399	\$6,728,509	\$6,896,722	\$7,069,140	\$7,245,868

[illegible]

Assumptions

Annual General Escalation Rate

Annual Out of County Haul Fee Escalation Rate

Annual Waste Escalation Rate

Annual Revenue Increase

Annual Average County Interest Rate

Sonoma County
Economic Analysis - 80% of System Tonnage
Scenario 3: Close Central Landfill and Outhaul

[illegible]

Closure/Post-Closure Expenses																						
Central Closure	\$	1,585,000					\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212	\$	1,893,212
Central Post Closure							\$	2,772,221		\$	2,883,110	\$	2,998,434	\$	3,118,372	\$	3,243,107	\$	3,372,831	\$	3,507,744	
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965

Sonoma County
Economic Analysis - 80% of System Tonnage
Scenario 4: Close Central Landfill and Outhaul via Rail

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	882,882	\$	926,920	\$	973,155	\$	1,021,696	\$	1,072,658	\$	1,126,162	\$	1,182,335	\$	1,241,310	\$	1,303,227	\$	1,368,232	\$	1,436,479
Education/Diversion/Planning	\$	378,378	\$	397,251	\$	417,066	\$	437,870	\$	459,711	\$	482,641	\$	506,715	\$	531,990	\$	558,526	\$	586,385	\$	615,634
County Diversion Costs	\$	553,942	\$	576,099	\$	599,143	\$	623,109	\$	648,034	\$	673,955	\$	700,913	\$	728,950	\$	758,108	\$	788,432	\$	819,969
	\$	1,815,202	\$	1,900,271	\$	1,989,365	\$	2,082,675	\$	2,180,402	\$	2,282,758	\$	2,389,963	\$	2,502,250	\$	2,619,860	\$	2,743,048	\$	2,872,082
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Central Tipping Building - Additional Operations	\$	1,791,373	\$	1,863,028	\$	1,937,549	\$	2,015,051	\$	2,095,653	\$	2,179,479	\$	2,266,658	\$	2,357,324	\$	2,451,617	\$	2,549,682	\$	2,651,669
Annapolis	\$	161,722	\$	168,191	\$	174,919	\$	181,915	\$	189,192	\$	196,760	\$	204,630	\$	212,815	\$	221,328	\$	230,181	\$	239,388
Guerneville	\$	350,232	\$	364,242	\$	378,811	\$	393,964	\$	409,722	\$	426,111	\$	443,156	\$	460,882	\$	479,317	\$	498,490	\$	518,430
Healdsburg	\$	744,120	\$	773,885	\$	804,840	\$	837,034	\$	870,515	\$	905,336	\$	941,549	\$	979,211	\$	1,018,380	\$	1,059,115	\$	1,101,479
Sonoma	\$	611,171	\$	635,617	\$	661,042	\$	687,484	\$	714,983	\$	743,582	\$	773,326	\$	804,259	\$	836,429	\$	869,886	\$	904,682
	\$	588,351	\$	611,885	\$	636,360	\$	661,815	\$	688,287	\$	715,819	\$	744,452	\$	774,230	\$	805,199	\$	837,407	\$	870,903
Transport to Central	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Central Tipping Building	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	9,157,713	\$	11,092,965	\$	11,422,315	\$	11,761,443	\$	12,110,641	\$	15,555,984	\$	16,017,841	\$	16,493,410	\$	16,983,100	\$	17,487,328	\$	18,006,527
Out of County Rail Haul and Disposal																						
	\$	9,157,713	\$	11,092,965	\$	11,422,315	\$	11,761,443	\$	12,110,641	\$	15,555,984	\$	16,017,841	\$	16,493,410	\$	16,983,100	\$	17,487,328	\$	18,006,527
Capital Improvements																						
Central Tipping Building	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	159,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	517,681	\$	538,388	\$	559,924	\$	582,321	\$	605,613	\$	629,838	\$	655,032	\$	681,233	\$	708,482	\$	736,821	\$	766,294
	\$	517,681	\$	538,388	\$	559,924	\$	582,321	\$	605,613	\$	629,838	\$	655,032	\$	681,233	\$	708,482	\$	736,821	\$	766,294
Administration (20% of total)																						
	\$	517,681	\$	538,388	\$	559,924	\$	582,321	\$	605,613	\$	629,838	\$	655,032	\$	681,233	\$	708,482	\$	736,821	\$	766,294
	\$	517,681	\$	538,388	\$	559,924	\$	582,321	\$	605,613	\$	629,838	\$	655,032	\$	681,233	\$	708,482	\$	736,821	\$	766,294
Total Transfer Station & Out of County Disposal Expenses																						
	\$	14,423,355	\$	16,102,280	\$	16,632,003	\$	17,179,519	\$	17,745,439	\$	22,663,779	\$	22,112,439	\$	22,831,793	\$	23,575,017	\$	24,342,922	\$	25,136,345
	\$	14,423,355	\$	16,102,280	\$	16,632,003	\$	17,179,519	\$	17,745,439	\$	22,663,779	\$	22,112,439	\$	22,831,793	\$	23,575,017	\$	24,342,922	\$	25,136,345
Disposal																						
Central Landfill																						
Operations	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Environmental Compliance	\$	3,835,459	\$	3,988,878	\$	4,148,433	\$	4,314,370	\$	4,486,945	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	-
Administration & Engineering (30% of total)	\$	776,521	\$	807,582	\$	839,886	\$	873,481	\$	908,420	\$	944,757	\$	982,547	\$	1,021,849	\$	1,062,723	\$	1,105,232	\$	1,149,441
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Environmental Compliance	\$	3,835,459	\$	3,988,878	\$	4,148,433	\$	4,314,370	\$	4,486,945	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	-
Administration & Engineering (30% of total)	\$	776,521	\$	807,582	\$	839,886	\$	873,481	\$	908,420	\$	944,757	\$	982,547	\$	1,021,849	\$	1,062,723	\$	1,105,232	\$	1,149,441
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	10,435,802	\$	6,506,431	\$	6,695,199	\$	6,899,157	\$	7,103,136	\$	2,655,548	\$	2,691,008	\$	2,733,805	\$	2,773,399	\$	2,815,102	\$	1,149,441
	\$	10,435,802	\$	6,506,431	\$	6,695,199	\$	6,899,157	\$	7,103,136	\$	2,655,548	\$	2,691,008	\$	2,733,805	\$	2,773,399	\$	2,815,102	\$	1,149,441
Total Disposal Expenses																						
	\$	10,435,802	\$	6,506,431	\$	6,695,199	\$	6,899,157	\$	7,103,136	\$	2,655,548	\$	2,691,008	\$	2,733,805	\$	2,773,399	\$	2,815,102	\$	1,149,441
	\$	10,435,802	\$	6,506,431	\$	6,695,199	\$	6,899,157	\$	7,103,136	\$	2,655,548	\$	2,691,008	\$	2,733,805	\$	2,773,399	\$	2,815,102	\$	1,149,441
Other																						
Administration (50% of total)	\$	1,294,202	\$	1,345,970	\$	1,399,809	\$	1,455,802	\$	1,514,034	\$	1,574,595	\$	1,637,579	\$	1,703,082	\$	1,771,205	\$	1,842,053	\$	1,915,736
Litter Control	\$	277,118	\$	288,203	\$	299,731	\$	311,720	\$	324,189	\$	337,157	\$	350,643	\$	364,669	\$	379,255	\$	394,426	\$	410,203
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	386,816	\$	402,289	\$	418,381	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	1,294,202	\$	1,345,970	\$	1,399,809	\$	1,455,802	\$	1,514,034	\$	1,574,595	\$	1,637,579	\$	1,703,082	\$	1,771,205	\$	1,842,053	\$	1,915,736
Litter Control	\$	277,118	\$	288,203	\$	299,731	\$	311,720	\$	324,189	\$	337,157	\$	350,643	\$	364,669	\$	379,255	\$	394,426	\$	410,203
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	386,816	\$	402,289	\$	418,381	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	5,261,979	\$	3,286,462	\$	4,027,921	\$	3,874,122	\$	4,563,087	\$	3,081,610	\$	3,204,875	\$	3,333,070	\$	3,466,392	\$	3,605,048	\$	3,749,250
	\$	5,261,979	\$	3,286,462	\$	4,027,921	\$	3,874,122	\$	4,563,087	\$	3,081,610	\$	3,204,875	\$	3,333,070	\$	3,466,392	\$	3,605,048	\$	3,749,250
Total Other Expenses																						
	\$	5,261,979	\$	3,286,462	\$	4,027,921	\$	3,874,122	\$	4,563,087	\$	3,081,610	\$	3,204,875	\$	3,333,070	\$	3,466,392	\$	3,605,048	\$	3,749,250
	\$	5,261,979	\$	3,286,462	\$	4,027,921	\$	3,874,122	\$	4,563,087	\$	3,081,610	\$	3,204,875	\$	3,333,070	\$	3,466,392	\$	3,605,048	\$	3,749,250
TOTAL EXPENSES																						
	\$	31,936,338	\$	27,795,445	\$	29,344,488	\$	30,035,473	\$	31,592,065	\$	30,683,695	\$	30,398,285	\$	31,400,917	\$	32,434,669	\$	33,506,121	\$	32,907,118
	\$	31,936,338	\$	27,795,445	\$	29,344,488	\$	30,035,473	\$	31,592,065	\$	30,683,695	\$	30,398,285	\$	3						

[illegible]

Sonoma County
Economic Analysis - 50% of System Tonnage
Scenario 1: Outhaul for 5 Years then Re-open Central with Normal Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	735,735	\$	772,433	\$	810,962	\$	851,413	\$	893,882	\$	938,469	\$	985,279	\$	1,034,425	\$	1,086,022	\$	1,140,193	\$	1,197,066
Education/Diversion/Planning	\$	315,315	\$	331,043	\$	347,555	\$	364,891	\$	383,092	\$	402,201	\$	422,263	\$	443,325	\$	465,438	\$	488,654	\$	513,028
County Diversion Costs	\$	461,618	\$	480,083	\$	499,286	\$	519,258	\$	540,028	\$	561,629	\$	584,094	\$	607,458	\$	631,756	\$	657,027	\$	683,308
Total Diversion & Waste Reduction Expenses	\$	1,512,668	\$	1,583,559	\$	1,657,804	\$	1,735,562	\$	1,817,002	\$	1,902,298	\$	1,991,636	\$	2,085,208	\$	2,183,217	\$	2,285,874	\$	2,393,402
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	490,292	\$	509,904	\$	530,300	\$	551,512	\$	573,573	\$	596,516	\$	620,376	\$	645,191	\$	670,999	\$	697,839	\$	725,753
Central Tipping Building - Additional Operations	\$	1,492,811	\$	1,552,523	\$	1,614,624	\$	1,679,209	\$	1,746,377	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	134,768	\$	140,159	\$	145,766	\$	151,596	\$	157,660	\$	163,966	\$	170,525	\$	177,346	\$	184,440	\$	191,817	\$	199,490
Guerneville	\$	291,860	\$	303,535	\$	315,676	\$	328,303	\$	341,435	\$	355,093	\$	369,297	\$	384,068	\$	399,431	\$	415,408	\$	432,025
Healdsburg	\$	620,100	\$	644,904	\$	670,700	\$	697,528	\$	725,429	\$	754,446	\$	784,624	\$	816,009	\$	848,650	\$	882,596	\$	917,899
Sonoma	\$	509,309	\$	529,681	\$	550,868	\$	572,903	\$	595,819	\$	619,652	\$	644,438	\$	670,216	\$	697,024	\$	724,905	\$	753,901
Transport to Central																						
Central Tipping Building	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	128,530	\$	133,671	\$	139,018	\$	144,578	\$	150,361	\$	156,376
Annapolis	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	25,747	\$	26,777	\$	27,848	\$	28,962	\$	30,121	\$	31,325
Guerneville	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	155,628	\$	161,853	\$	168,327	\$	175,060	\$	182,062	\$	189,345
Healdsburg	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	544,805	\$	566,597	\$	589,261	\$	612,831	\$	637,345	\$	662,838
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	393,539	\$	409,280	\$	425,652	\$	442,678	\$	460,385	\$	478,800
Out of County Haul and Disposal	\$	5,723,571	\$	6,933,103	\$	7,138,947	\$	7,350,902	\$	7,569,150	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Improvements																						
Central Tipping Building	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	156,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
Administration (20% of total)	\$	431,401	\$	448,657	\$	466,603	\$	485,267	\$	504,678	\$	524,865	\$	545,860	\$	567,694	\$	590,402	\$	614,018	\$	638,579
Total Transfer Station & Out of County Disposal Expenses	\$	10,191,605	\$	11,116,546	\$	11,489,728	\$	11,875,714	\$	12,274,955	\$	4,326,052	\$	4,499,094	\$	4,679,058	\$	4,866,221	\$	5,060,869	\$	5,263,304
Disposal																						
Central Landfill																						
Operations	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	9,541,435	\$	10,017,362	\$	10,517,028	\$	11,041,617	\$	11,592,373	\$	12,170,601
Environmental Compliance	\$	3,196,216	\$	3,324,065	\$	3,457,027	\$	3,595,308	\$	3,739,121	\$	3,888,686	\$	4,044,233	\$	4,206,002	\$	4,374,243	\$	4,549,212	\$	4,731,181
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	-
Administration & Engineering (30% of total)	\$	647,101	\$	672,985	\$	699,905	\$	727,901	\$	757,017	\$	787,297	\$	818,789	\$	851,541	\$	885,603	\$	921,027	\$	957,868
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development																						
Total Disposal Expenses	\$	9,667,138	\$	5,707,021	\$	5,863,813	\$	6,034,515	\$	6,203,909	\$	20,048,823	\$	20,709,460	\$	21,407,141	\$	22,132,753	\$	22,893,096	\$	21,980,263
Other																						
Administration (50% of total)	\$	1,078,502	\$	1,121,642	\$	1,166,508	\$	1,213,168	\$	1,261,695	\$	1,312,162	\$	1,364,649	\$	1,419,235	\$	1,476,004	\$	1,535,044	\$	1,596,446
Litter Control	\$	230,932	\$	240,169	\$	249,776	\$	259,767	\$	270,158	\$	280,964	\$	292,202	\$	303,891	\$	316,046	\$	328,688	\$	341,836
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	322,347	\$	335,241	\$	348,651	\$	362,597	\$	377,100	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Total Other Expenses	\$	4,935,623	\$	2,947,052	\$	3,674,934	\$	3,942,131	\$	4,633,817	\$	2,762,985	\$	2,873,504	\$	2,988,445	\$	3,107,982	\$	3,232,302	\$	3,361,594
TOTAL EXPENSES	\$	26,307,034	\$	21,354,178	\$	22,686,279	\$	23,587,923	\$	24,929,682	\$	29,040,159	\$	30,073,695	\$	31,159,852	\$	32,290,172	\$	33,472,141	\$	32,998,563
REVENUES																						
Incoming Revenues	\$	3,242,000	\$	3,290,630	\$	3,339,989	\$	3,390,089	\$	3,440,941	\$	3,492,555	\$	3,544,943	\$	3,598,117	\$	3,652,089	\$	3,706,870	\$	3,762,473
JPA Revenues	\$	1,051,050	\$	1,103,476	\$	1,158,518	\$	1,216,305	\$	1,276,974	\$	1,340,669	\$	1,407,542	\$	1,477,750	\$	1,551,460	\$	1,628,847	\$	1,710,094
First Year Use of Fund Balance	\$	9861,953																				
Direct Haul Revenues	\$	676,406	\$	1,485,581	\$	1,635,260	\$	1,723,864	\$	1,872,813												
West Expansion - Rock Quarry Royalties																						
TOTAL REVENUES	\$	14,831,409	\$	5,879,688	\$	6,133,767	\$	6,330,258	\$	6,590,728	\$	4,833,224	\$	4,952,485	\$	5,075,867	\$	5,203,549	\$	5,335,717	\$	5,472,567
NET EXPENSES	\$	11,475,625	\$	15,474,490	\$	16,552,512	\$	17,257,665	\$	18,338,954	\$	24,206,935	\$	25,121,209	\$	26,083,985	\$	27,086,623	\$	28,136,423	\$	27,525,995
Calculated Tipping Fee	\$	69.79	\$	95.75	\$	101.45	\$	104.78	\$	110.30	\$	124.07	\$	127.54	\$	131.18	\$	134.95	\$	138.86	\$	134.57

Closure/Post-Closure Expenses

Central Closure	\$	1,585,000						\$	1,572,386	\$	1,635,282	\$	1,700,693	\$	1,768,721	\$	1,839,470	\$	1,913,048	\$	1,989,570	\$	2,069,153	\$	2,151,919	\$	2,237,996	\$	2,327,516	\$	2,420,616	\$	2,517,441	\$	2,618,139	\$	2,722,864			
Central Post Closure								\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-			
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254

Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	3,176,759	\$	3,303,829	\$	3,435,982	\$	3,573,422	\$	3,716,359	\$	3,865,013	\$	4,019,613	\$	4,180,398	\$	4,347,614	\$	4,521,519	\$	4,702,379	\$	4,890,474	\$	5,086,093	\$	5,289,537	\$	5,501,119
--	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------

Calculated Tipping Fee	\$	87.45	\$	104.23	\$	110.19	\$	113.78	\$	119.57	\$	140.35	\$	144.32	\$	148.47	\$	152.75	\$	157.20	\$	153.46	\$	158.34	\$	163.39	\$	168.64	\$	174.07	\$	179.71	\$	185.56	\$	191.62	\$	202.67	\$	209.33
------------------------	----	-------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------

Proposed New Zero Waste/Diversion Programs

Mandatory Source Separation	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
C&D Diversion	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
Public Education	\$	-	\$	121,680	\$	126,547	\$	131,609	\$	136,873	\$	142,348	\$	148,042	\$	153,964	\$	160,123	\$	166,527	\$	173,189	\$	180,116	\$	187,321	\$	194,814	\$	202,606	\$	210,710	\$	219,139	\$	227,904	\$	237,021	\$	246,501
Commercial Outreach & Tech Assistance	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
Market Development	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668
Zero Waste R&D	\$	-	\$	45,427	\$	47,244	\$	49,134	\$	51,099	\$	53,143	\$	55,269	\$	57,480	\$	59,779	\$	62,170	\$	64,657	\$	67,243	\$	69,933	\$	72,730	\$	75,640	\$	78,665	\$	81,812	\$	85,084	\$	88,488	\$	92,027
LTF Programs	\$	-	\$	283,920	\$	295,277	\$	307,088	\$	319,371	\$	332,146	\$	345,432	\$	359,249	\$	373,619	\$	388,564	\$	404,107	\$	420,271	\$	437,082	\$	454,565	\$	472,748	\$	491,658	\$	511,324	\$	531,777	\$	553,048	\$	575,170

Subtotal Zero Waste Programs	\$	-	\$	856,627	\$	890,892	\$	926,528	\$	963,589	\$	1,002,133	\$	1,042,218	\$	1,083,907	\$	1,127,263	\$	1,172,353	\$	1,219,248	\$	1,268,018	\$	1,318,738	\$	1,371,488	\$	1,426,347	\$	1,483,401	\$	1,542,737	\$	1,604,447	\$	1,668,625	\$	1,735,370
------------------------------	----	---	----	---------	----	---------	----	---------	----	---------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------

Calculated Tipping Fee	\$	87.45	\$	109.53	\$	115.65	\$	119.41	\$	125.37	\$	145.49	\$	149.61	\$	153.92	\$	158.36	\$	162.98	\$	159.42	\$	164.48	\$	169.72	\$	175.15	\$	180.79	\$	186.63	\$	192.68	\$	198.96	\$	210.23	\$	217.12
------------------------	----	-------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------

Total Expenses Less Revenues w/ Zero Waste	\$	14,379,302	\$	17,702,542	\$	18,869,685	\$	19,667,525	\$	20,845,209	\$	28,385,827	\$	29,467,257	\$	30,603,874	\$	31,787,307	\$	33,025,136	\$	32,610,256	\$	33,964,149	\$	35,379,607	\$	36,859,412	\$	38,406,473	\$	40,023,834	\$	41,714,674	\$	43,482,317	\$	46,383,666	\$	48,357,643
--	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------

Net Present Value (NPV) of Total Expenses Less Revenues	\$367,184,083
---	---------------

Total Expenses Less Revenues w/o Zero Waste	\$	14,379,302	\$	16,845,915	\$	17,978,793	\$	18,740,997	\$	19,881,620	\$	27,383,694	\$	28,425,039	\$	29,519,967	\$	30,660,044	\$	31,852,782	\$	31,391,008	\$	32,696,132	\$	34,060,868	\$	35,487,924	\$	36,980,126	\$	38,540,433	\$	40,171,936	\$	41,877,871	\$	44,715,042	\$	46,622,274
---	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------

Net Present Value (NPV) of Total Expenses Less Revenues	\$353,620,962
---	---------------

Operating Reserves/Fund Balance

Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Operating Reserve Interest	\$	0	\$	30,559	\$	53,073	\$	80,024	\$	122,025	\$	125,076	\$	128,202	\$	131,408	\$	134,693	\$	138,060	\$	141,512	\$	145,049	\$	148,676	\$	152,392	\$	156,202	\$	160,107	\$	164,110	\$	168,213	\$	172,418	\$	176,728
Operating Reserve	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868
Year End - Fund Balance	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868

TONNAGE FLOW

Amount of Waste Received at County Facilities	164,433	161,621	163,156	164,706	166,271	195,109	196,963	198,834	200,723	202,630	204,555	206,498	208,460	210,440	212,439	214,457	216,495	218,552	220,628	222,724
Amount to Central	-	-	-	-	-	195,109	196,963	198,834	200,723	202,630	204,555	206,498	208,460	210,440	212,439	214,457	216,495	218,552	220,628	222,724
Total System Waste	186,100	187,868	189,653	191,454	193,273	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amount Hauled Out of County	164,433	161,621	163,156	164,706	166,271	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amount Direct Haul	26,000	26,247	26,496	26,748	27,002															

Assumptions

Annual General Escalation Rate	4.0%
Annual Out of County Haul Fee Escalation Rate	2.0%
Annual Waste Escalation Rate	0.95%
Annual Revenue Increase	1.5%
Annual Average County Interest Rate	5.0%

Sonoma County
Economic Analysis - 50% of System Tonnage
Scenario 2: Outhaul for 5 Years then Re-open Central with Robust Containment System

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	735,735	\$	772,433	\$	810,962	\$	851,413	\$	893,882	\$	938,469	\$	985,279	\$	1,034,425	\$	1,086,022	\$	1,140,193	\$	1,197,066
Education/Diversion/Planning	\$	315,315	\$	331,043	\$	347,555	\$	364,891	\$	383,092	\$	402,201	\$	422,263	\$	443,325	\$	465,438	\$	488,654	\$	513,028
County Diversion Costs	\$	461,618	\$	480,083	\$	499,286	\$	519,258	\$	540,028	\$	561,629	\$	584,094	\$	607,458	\$	631,756	\$	657,027	\$	683,308
Total Diversion & Waste Reduction Expenses	\$	1,512,668	\$	1,583,559	\$	1,657,804	\$	1,735,562	\$	1,817,002	\$	1,902,298	\$	1,991,636	\$	2,085,208	\$	2,183,217	\$	2,285,874	\$	2,393,402
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	490,292	\$	509,904	\$	530,300	\$	551,512	\$	573,573	\$	596,516	\$	620,376	\$	645,191	\$	670,999	\$	697,839	\$	725,753
Central Tipping Building - Additional Operations	\$	1,492,811	\$	1,552,523	\$	1,614,624	\$	1,679,209	\$	1,746,377	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	134,768	\$	140,159	\$	145,766	\$	151,596	\$	157,660	\$	163,966	\$	170,525	\$	177,346	\$	184,440	\$	191,817	\$	199,490
Guerneville	\$	291,860	\$	303,535	\$	315,676	\$	328,303	\$	341,435	\$	355,093	\$	369,297	\$	384,068	\$	399,431	\$	415,408	\$	432,025
Healdsburg	\$	620,100	\$	644,904	\$	670,700	\$	697,528	\$	725,429	\$	754,446	\$	784,624	\$	816,009	\$	848,650	\$	882,596	\$	917,899
Sonoma	\$	509,309	\$	529,681	\$	550,868	\$	572,903	\$	595,819	\$	619,652	\$	644,438	\$	670,216	\$	697,024	\$	724,905	\$	753,901
Transport to Central																						
Central Tipping Building	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	128,530	\$	133,671	\$	139,018	\$	144,578	\$	150,361	\$	156,376
Annapolis	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	25,747	\$	26,777	\$	27,848	\$	28,962	\$	30,121	\$	31,325
Guerneville	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	155,628	\$	161,853	\$	168,327	\$	175,060	\$	182,062	\$	189,345
Healdsburg	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	544,805	\$	566,597	\$	589,261	\$	612,831	\$	637,345	\$	662,838
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	393,539	\$	409,280	\$	425,652	\$	442,678	\$	460,385	\$	478,800
Out of County Haul and Disposal	\$	5,723,571	\$	6,933,103	\$	7,138,947	\$	7,350,902	\$	7,569,150	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Improvements																						
Central Tipping Building	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	156,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
Administration (20% of total)	\$	431,401	\$	448,657	\$	466,603	\$	485,267	\$	504,678	\$	524,865	\$	545,860	\$	567,694	\$	590,402	\$	614,018	\$	638,579
Total Transfer Station & Out of County Disposal Expenses	\$	10,191,605	\$	11,116,546	\$	11,489,728	\$	11,875,714	\$	12,274,955	\$	4,326,052	\$	4,499,094	\$	4,679,058	\$	4,866,221	\$	5,060,869	\$	5,263,304
Disposal																						
Central Landfill																						
Operations	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	9,541,435	\$	10,017,362	\$	10,517,028	\$	11,041,617	\$	11,592,373	\$	12,170,601
Environmental Compliance	\$	3,196,216	\$	3,324,065	\$	3,457,027	\$	3,595,308	\$	3,739,121	\$	3,888,686	\$	4,044,233	\$	4,206,002	\$	4,374,243	\$	4,549,212	\$	4,731,181
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	-
Administration & Engineering (30% of total)	\$	647,101	\$	672,985	\$	699,905	\$	727,901	\$	757,017	\$	787,297	\$	818,789	\$	851,541	\$	885,603	\$	921,027	\$	957,868
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development																						
Total Disposal Expenses	\$	9,667,138	\$	5,707,021	\$	5,863,813	\$	6,034,515	\$	6,203,909	\$	21,543,213	\$	22,203,849	\$	22,901,531	\$	23,627,142	\$	24,387,486	\$	23,474,653
Other																						
Administration (50% of total)	\$	1,078,502	\$	1,121,642	\$	1,166,508	\$	1,213,168	\$	1,261,695	\$	1,312,162	\$	1,364,649	\$	1,419,235	\$	1,476,004	\$	1,535,044	\$	1,596,446
Litter Control	\$	230,932	\$	240,169	\$	249,776	\$	259,767	\$	270,158	\$	280,964	\$	292,202	\$	303,891	\$	316,046	\$	328,688	\$	341,836
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	322,347	\$	335,241	\$	348,651	\$	362,597	\$	377,100	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Total Other Expenses	\$	4,935,623	\$	2,947,052	\$	3,674,934	\$	3,942,131	\$	4,633,817	\$	2,762,985	\$	2,873,504	\$	2,988,445	\$	3,107,982	\$	3,232,302	\$	3,361,594
TOTAL EXPENSES	\$	26,307,034	\$	21,354,178	\$	22,686,279	\$	23,587,923	\$	24,929,682	\$	30,534,549	\$	31,568,084	\$	32,654,242	\$	33,784,562	\$	34,966,531	\$	34,492,953
REVENUES																						
Incoming Revenues	\$	3,242,000	\$	3,290,630	\$	3,339,989	\$	3,390,089	\$	3,440,941	\$	3,492,555	\$	3,544,943	\$	3,598,117	\$	3,652,089	\$	3,706,870	\$	3,762,473
JPA Revenues	\$	1,051,050	\$	1,103,476	\$	1,158,518	\$	1,216,305	\$	1,276,974	\$	1,340,669	\$	1,407,542	\$	1,477,750	\$	1,551,460	\$	1,628,847	\$	1,710,094
First Year Use of Fund Balance	\$	9861,953																				
Direct Haul Revenues	\$	676,406	\$	1,485,581	\$	1,635,260	\$	1,723,864	\$	1,872,813												
West Expansion - Rock Quarry Royalties																						
TOTAL REVENUES	\$	14,831,409	\$	5,879,688	\$	6,133,767	\$	6,330,258	\$	6,590,728	\$	4,833,224	\$	4,952,485	\$	5,075,867	\$	5,203,549	\$	5,335,717	\$	5,472,567
NET EXPENSES	\$	11,475,625	\$	15,474,490	\$	16,552,512	\$	17,257,665	\$	18,338,954	\$	25,701,325	\$	26,615,599	\$	27,578,375	\$	28,581,012	\$	29,630,813	\$	29,020,385
Calculated Tipping Fee	\$	69.79	\$	95.75	\$	101.45	\$	104.78	\$	110.30	\$	131.73	\$	135.13	\$	138.70	\$	142.39	\$	146.23	\$	141.87

Closure/Post-Closure Expenses

Central Closure	\$	1,585,000						\$	1,572,386	\$	1,635,282	\$	1,700,693	\$	1,768,721	\$	1,839,470	\$	1,913,048	\$	1,989,570	\$	2,069,153	\$	2,151,919	\$	2,237,996	\$	2,327,516	\$	2,420,616	\$	2,517,441	\$	2,618,139	\$	2,722,864			
Central Post Closure								\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-			
All Other Landfills Post Closure	\$	1,318,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	1,604,373	\$	1,668,548	\$	1,735,289	\$	1,804,701	\$	1,876,889	\$	1,951,965	\$	2,030,043	\$	2,111,245	\$	2,195,695	\$	2,283,523	\$	2,374,863	\$	2,469,858	\$	2,568,652	\$	2,671,398	\$	2,778,254

Subtotal Closure/Post-Closure Expenses	\$	2,903,677	\$	1,371,424	\$	1,426,281	\$	1,483,333	\$	1,542,666	\$	3,176,759	\$	3,303,829	\$	3,435,982	\$	3,573,422	\$	3,716,359	\$	3,865,013	\$	4,019,613	\$	4,180,398	\$	4,347,614	\$	4,521,519	\$	4,702,379	\$	4,890,474	\$	5,086,093	\$	5,289,537	\$	5,501,119
--	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------

Calculated Tipping Fee	\$	87.45	\$	104.23	\$	110.19	\$	113.78	\$	119.57	\$	148.01	\$	151.90	\$	155.98	\$	160.19	\$	164.57	\$	160.77	\$	165.57	\$	170.56	\$	175.74	\$	181.11	\$	186.68	\$	192.46	\$	198.45	\$	209.45	\$	216.04
------------------------	----	-------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------

Proposed New Zero Waste/Diversion Programs

Mandatory Source Separation	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
C&D Diversion	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
Public Education	\$	-	\$	121,680	\$	126,547	\$	131,609	\$	136,873	\$	142,348	\$	148,042	\$	153,964	\$	160,123	\$	166,527	\$	173,189	\$	180,116	\$	187,321	\$	194,814	\$	202,606	\$	210,710	\$	219,139	\$	227,904	\$	237,021	\$	246,501
Commercial Outreach & Tech Assistance	\$	-	\$	81,120	\$	84,365	\$	87,739	\$	91,249	\$	94,899	\$	98,695	\$	102,643	\$	106,748	\$	111,018	\$	115,459	\$	120,077	\$	124,881	\$	129,876	\$	135,071	\$	140,474	\$	146,093	\$	151,936	\$	158,014	\$	164,334
Market Development	\$	-	\$	162,240	\$	168,730	\$	175,479	\$	182,498	\$	189,798	\$	197,390	\$	205,285	\$	213,497	\$	222,037	\$	230,918	\$	240,155	\$	249,761	\$	259,751	\$	270,142	\$	280,947	\$	292,185	\$	303,872	\$	316,027	\$	328,668
Zero Waste R&D	\$	-	\$	45,427	\$	47,244	\$	49,134	\$	51,099	\$	53,143	\$	55,269	\$	57,480	\$	59,779	\$	62,170	\$	64,657	\$	67,243	\$	69,933	\$	72,730	\$	75,640	\$	78,665	\$	81,812	\$	85,084	\$	88,488	\$	92,027
LTF Programs	\$	-	\$	283,920	\$	295,277	\$	307,088	\$	319,371	\$	332,146	\$	345,432	\$	359,249	\$	373,619	\$	388,564	\$	404,107	\$	420,271	\$	437,082	\$	454,565	\$	472,748	\$	491,658	\$	511,324	\$	531,777	\$	553,048	\$	575,170

Subtotal Zero Waste Programs	\$	-	\$	856,627	\$	890,892	\$	926,528	\$	963,589	\$	1,002,133	\$	1,042,218	\$	1,083,907	\$	1,127,263	\$	1,172,353	\$	1,219,248	\$	1,268,018	\$	1,318,738	\$	1,371,488	\$	1,426,347	\$	1,483,401	\$	1,542,737	\$	1,604,447	\$	1,668,625	\$	1,735,370
------------------------------	----	---	----	---------	----	---------	----	---------	----	---------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------	----	-----------

Calculated Tipping Fee	\$	87.45	\$	109.53	\$	115.65	\$	119.41	\$	125.37	\$	153.15	\$	157.20	\$	161.43	\$	165.81	\$	170.36	\$	166.73	\$	171.71	\$	176.89	\$	182.26	\$	187.82	\$	193.60	\$	199.58	\$	205.79	\$	217.01	\$	223.83
------------------------	----	-------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------

Total Expenses Less Revenues w/ Zero Waste	\$	14,379,302	\$	17,702,542	\$	18,869,685	\$	19,667,525	\$	20,845,209	\$	29,880,216	\$	30,961,646	\$	32,098,264	\$	33,281,697	\$	34,519,525	\$	34,104,646	\$	35,458,539	\$	36,873,996	\$	38,353,801	\$	39,900,863	\$	41,518,224	\$	43,209,063	\$	44,976,707	\$	47,878,056	\$	49,852,033
--	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------

Net Present Value (NPV) of Total Expenses Less Revenues	\$379,337,556
---	---------------

Total Expenses Less Revenues w/o Zero Waste	\$	14,379,302	\$	16,845,915	\$	17,978,793	\$	18,740,997	\$	19,881,620	\$	28,878,084	\$	29,919,428	\$	31,014,357	\$	32,154,434	\$	33,347,172	\$	32,885,398	\$	34,190,521	\$	35,555,258	\$	36,982,314	\$	38,474,516	\$	40,034,823	\$	41,666,326	\$	43,372,260	\$	46,209,431	\$	48,116,664
---	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------	----	------------

Net Present Value (NPV) of Total Expenses Less Revenues	\$365,774,436
---	---------------

Operating Reserves/Fund Balance

Year Beginning - Fund Balance	\$	9,861,953	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140
Operating Reserve Deposit	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Operating Reserve Interest	\$	0	\$	30,559	\$	53,073	\$	80,024	\$	122,025	\$	125,076	\$	128,202	\$	131,408	\$	134,693	\$	138,060	\$	141,512	\$	145,049	\$	148,676	\$	152,392	\$	156,202	\$	160,107	\$	164,110	\$	168,213	\$	172,418	\$	176,728
Operating Reserve	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868
Year End - Fund Balance	\$	972,342	\$	1,252,901	\$	2,175,973	\$	3,280,997	\$	5,003,022	\$	5,128,098	\$	5,256,300	\$	5,387,708	\$	5,522,401	\$	5,660,461	\$	5,801,972	\$	5,947,021	\$	6,095,697	\$	6,248,089	\$	6,404,292	\$	6,564,399	\$	6,728,509	\$	6,896,722	\$	7,069,140	\$	7,245,868

TONNAGE FLOW

Amount of Waste Received at County Facilities	164,433	161,621	163,156	164,706	166,271	195,109	196,963	198,834	200,723	202,630	204,555	206,498	208,460	210,440	212,439	214,457	216,495	218,552	220,628	222,724
Amount to Central	-	-	-	-	-	195,109	196,963	198,834	200,723	202,630	204,555	206,498	208,460	210,440	212,439	214,457	216,495	218,552	220,628	222,724
Total System Waste	186,100	187,868	189,653	191,454	193,273	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amount Hauled Out of County	164,433	161,621	163,156	164,706	166,271	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amount Direct Haul	26,000	26,247	26,496	26,748	27,002															

Assumptions

Annual General Escalation Rate	4.0%
Annual Out of County Haul Fee Escalation Rate	2.0%
Annual Waste Escalation Rate	0.95%
Annual Revenue Increase	1.5%
Annual Average County Interest Rate	5.0%

Sonoma County
Economic Analysis - 50% of System Tonnage
Scenario 3: Close Central Landfill and Outhaul

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	735,735	\$	772,433	\$	810,962	\$	851,413	\$	893,882	\$	938,469	\$	985,279	\$	1,034,425	\$	1,086,022	\$	1,140,193	\$	1,197,066
Education/Diversion/Planning	\$	315,315	\$	331,043	\$	347,555	\$	364,891	\$	383,092	\$	402,201	\$	422,263	\$	443,325	\$	465,438	\$	488,654	\$	513,028
County Diversion Costs	\$	461,618	\$	480,083	\$	499,286	\$	519,258	\$	540,028	\$	561,629	\$	584,094	\$	607,458	\$	631,756	\$	657,027	\$	683,308
	\$	1,512,668	\$	1,583,559	\$	1,657,804	\$	1,735,562	\$	1,817,002	\$	1,902,298	\$	1,991,636	\$	2,085,208	\$	2,183,217	\$	2,285,874	\$	2,393,402
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	490,292	\$	509,904	\$	530,300	\$	551,512	\$	573,573	\$	596,516	\$	620,376	\$	645,191	\$	670,999	\$	697,839	\$	725,753
Central Tipping Building - Additional Operations	\$	1,492,811	\$	1,552,523	\$	1,614,624	\$	1,679,209	\$	1,746,377	\$	1,816,232	\$	1,888,882	\$	1,964,437	\$	2,043,014	\$	2,124,735	\$	2,209,724
Annapolis	\$	134,768	\$	140,159	\$	145,766	\$	151,596	\$	157,660	\$	163,966	\$	170,525	\$	177,346	\$	184,440	\$	191,817	\$	199,490
Guerneville	\$	291,860	\$	303,535	\$	315,676	\$	328,303	\$	341,435	\$	355,093	\$	369,297	\$	384,068	\$	399,431	\$	415,408	\$	432,025
Healdsburg	\$	620,100	\$	644,904	\$	670,700	\$	697,528	\$	725,429	\$	754,446	\$	784,624	\$	816,009	\$	848,650	\$	882,596	\$	917,899
Sonoma	\$	509,309	\$	529,681	\$	550,868	\$	572,903	\$	595,819	\$	619,652	\$	644,438	\$	670,216	\$	697,024	\$	724,905	\$	753,901
	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	5,723,571	\$	6,933,103	\$	7,138,947	\$	7,350,902	\$	7,569,150	\$	9,059,593	\$	9,328,572	\$	9,605,537	\$	9,890,726	\$	10,184,381	\$	10,486,756
Out of County Haul and Disposal																						
	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	159,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	431,401	\$	448,657	\$	466,603	\$	485,267	\$	504,678	\$	524,865	\$	545,860	\$	567,694	\$	590,402	\$	614,018	\$	638,579
	\$	431,401	\$	448,657	\$	466,603	\$	485,267	\$	504,678	\$	524,865	\$	545,860	\$	567,694	\$	590,402	\$	614,018	\$	638,579
	\$	664,122	\$	690,687	\$	718,314	\$	747,047	\$	776,928	\$	808,006	\$	840,326	\$	873,939	\$	908,896				
	\$	10,195,105	\$	11,116,546	\$	11,489,728	\$	11,875,714	\$	12,274,955	\$	15,201,234	\$	14,418,370	\$	14,898,927	\$	15,395,851	\$	15,909,712	\$	16,441,099
	\$	16,441,099	\$	16,990,625	\$	17,558,921	\$	18,146,645	\$	18,754,473	\$	19,383,110	\$	20,033,284	\$	20,705,749	\$	21,401,287	\$	22,120,707		
Total Transfer Station & Out of County Disposal Expenses																						
Disposal																						
Central Landfill																						
Operations	\$	4,113,200	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Environmental Compliance	\$	3,196,216	\$	3,324,065	\$	3,457,027	\$	3,595,308	\$	3,739,121	\$	3,888,882	\$	4,043,763	\$	4,204,844	\$	4,372,125	\$	4,545,606	\$	4,724,527
Debt Service	\$	1,710,621	\$	1,709,971	\$	1,706,881	\$	1,711,306	\$	1,707,771	\$	1,710,791	\$	1,708,461	\$	1,711,956	\$	1,710,676	\$	1,709,870	\$	1,710,621
Administration & Engineering (30% of total)	\$	647,101	\$	672,985	\$	699,905	\$	727,901	\$	757,017	\$	787,297	\$	818,789	\$	851,541	\$	885,603	\$	921,027	\$	957,868
Containment System	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
West Canyon Development	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	9,667,138	\$	5,707,021	\$	5,863,813	\$	6,034,515	\$	6,203,909	\$	2,498,088	\$	2,527,250	\$	2,563,497	\$	2,596,279	\$	2,630,897	\$	957,868
	\$	957,868	\$	996,182	\$	1,036,030	\$	1,077,471	\$	1,120,570	\$	1,165,393	\$	1,212,008	\$	1,260,489	\$	1,310,908	\$	1,363,345		
Total Disposal Expenses																						
Other																						
Administration (50% of total)	\$	1,078,502	\$	1,121,642	\$	1,166,508	\$	1,213,168	\$	1,261,695	\$	1,312,162	\$	1,364,649	\$	1,419,235	\$	1,476,004	\$	1,535,044	\$	1,596,446
Litter Control	\$	230,932	\$	240,169	\$	249,776	\$	259,767	\$	270,158	\$	280,964	\$	292,202	\$	303,891	\$	316,046	\$	328,688	\$	341,836
Capital Expenditures at Disposal Sites	\$	2,331,500	\$	1,000,000	\$	1,040,000	\$	1,081,600	\$	1,124,864	\$	1,169,859	\$	1,216,653	\$	1,265,319	\$	1,315,932	\$	1,368,569	\$	1,423,312
Deposit to Operating Reserve	\$	972,342	\$	250,000	\$	870,000	\$	1,025,000	\$	1,600,000												
Engineering for Other Capital Projects	\$	322,347	\$	335,241	\$	348,651	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	4,935,623	\$	2,947,052	\$	3,674,934	\$	3,579,535	\$	4,256,716	\$	2,762,985	\$	2,873,504	\$	2,988,445	\$	3,107,982	\$	3,232,302	\$	3,361,594
	\$	3,361,594	\$	3,496,057	\$	3,635,900	\$	3,781,336	\$	3,932,589	\$	4,089,893	\$	4,253,488	\$	4,423,628	\$	4,600,573	\$	4,784,596		
	\$	4,784,596	\$	4,979,939	\$	5,184,832	\$	5,399,899	\$	5,625,932	\$	5,862,965	\$	6,109,998	\$	6,368,031	\$	6,633,064	\$	6,908,097	\$	7,193,130
	\$	7,193,130	\$	7,493,130	\$	7,808,097	\$	8,128,097	\$	8,462,965	\$	8,812,965	\$	9,178,998	\$	9,560,031	\$	9,957,064	\$	10,370,097	\$	10,808,130
	\$	10,808,130	\$	11,354,178	\$	11,928,211	\$	12,520,244	\$	13,139,277	\$	13,786,310	\$	14,460,343	\$	15,165,376	\$	15,895,409	\$	16,650,442	\$	17,440,475
	\$	17,440,475	\$	18,265,501	\$	19,128,527	\$	20,030,553	\$	20,972,579	\$	21,954,605	\$	22,976,631	\$	24,038,657	\$	25,140,683	\$	26,282,709	\$	27,464,735
	\$	27,464,735	\$	28,684,685	\$	30,000,711	\$	31,412,737	\$	32,912,763	\$	34,502,789	\$	36,184,815	\$	37,958,841	\$	39,826,867	\$	41,790,893	\$	43,840,920
	\$	43,840,920	\$	45,938,946	\$	48,090,972	\$	50,296,998	\$	52,557,024	\$	54,872,050	\$	57,243,076	\$	59,660,102	\$	62,126,128	\$	64,665,154	\$	67,265,180
	\$	67,265,180	\$	70,000,711	\$	72,790,737	\$	75,635,763	\$	78,535,789	\$	81,490,815	\$	84,500,841	\$	87,565,867	\$	90,685,893	\$	93,860,920	\$	97,090,946
	\$	97,090,946	\$	101,354,178	\$	105,708,410	\$	110,162,642	\$	114,716,874	\$	119,381,106	\$	124,155,338	\$	129,039,570	\$	134,033,802	\$	139,138,034	\$	144,353,266
	\$	144,353,266	\$	149,478,292	\$	154,812,524	\$	160,356,756	\$	166,010,988	\$	171,775,220	\$	177,649,452	\$	183,633,684	\$	189,727,916	\$	195,932,148	\$	202,246,380
	\$	202,246,380	\$	208,665,612	\$	215,299,842	\$	222,053,072	\$	228,927,302	\$	235,921,532	\$	243,035,762	\$	250,269,992	\$	257,634,222	\$	265,128,452	\$	272,762,682
	\$	272,762,682	\$	280,557,914	\$	288,503,146	\$	296,608,378	\$	304,873,610	\$	313,298,842	\$	321,884,074	\$	330,529,306	\$	339,334,538	\$	348,299,770	\$	357,425,002
	\$	357,425,002	\$	366,529,234	\$	375,793,466	\$	385,217,698	\$	394,801,930	\$	404,546,162	\$	414,450,394	\$	424,514,626	\$	434,738,858	\$	445,123,090	\$	455,667,322
	\$	455,667,322	\$	466,321,554	\$	477,135,786	\$	488,110,018	\$	499,244,250	\$	510,538,482	\$	521,992,714	\$	533,606,946	\$	545,381,178	\$	557,315,410	\$	569,409,642
	\$	569,409,642	\$	581,563,874	\$	593,878,106	\$	606,352,338	\$	618,986,570	\$	631,780,802	\$	644,735,034	\$	657,849,266	\$	671,123,498	\$	684,567,730	\$	698,171,962
	\$	698,171,962	\$	711,846,194	\$	725,680,426	\$	739,674,658	\$	753,828,890	\$	768,143,122	\$	782,617,354	\$	797,251,586	\$	812,075,818	\$	827,060,050	\$	842,214,282
	\$	842,214,282	\$	857,388,514	\$	872,682,746	\$	888,097,978	\$	903,633,210	\$	919,288,442	\$	935,063,674	\$	950,958,906	\$	966,974,138	\$	983,109,370	\$	999,364,602
	\$	999,364,602	\$	1,015,538,834	\$	1,031,853,066	\$	1,048,297,298	\$	1,064,871,530	\$	1,081,485,762	\$	1,098,130,994	\$	1,114,906,226	\$	1,131,812,458	\$	1,148,848,690	\$	1,165,914,922
	\$																					

[illegible]

Sonoma County
Economic Analysis - 50% of System Tonnage
Scenario 4: Close Central Landfill and Outhaul via Rail

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Fiscal Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	
EXPENSES																						
Diversion & Waste Reduction																						
Existing JPA Programs																						
Wood Waste	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Yard Debris	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Household Hazardous Waste	\$	735,735	\$	772,433	\$	810,962	\$	851,413	\$	893,882	\$	938,469	\$	985,279	\$	1,034,425	\$	1,086,022	\$	1,140,193	\$	1,197,066
Education/Diversion/Planning	\$	315,315	\$	331,043	\$	347,555	\$	364,891	\$	383,092	\$	402,201	\$	422,263	\$	443,325	\$	465,438	\$	488,654	\$	513,028
County Diversion Costs	\$	461,618	\$	480,083	\$	499,286	\$	519,258	\$	540,028	\$	561,629	\$	584,094	\$	607,458	\$	631,756	\$	657,027	\$	683,308
	\$	1,512,668	\$	1,583,559	\$	1,657,804	\$	1,735,562	\$	1,817,002	\$	1,902,298	\$	1,991,636	\$	2,085,208	\$	2,183,217	\$	2,285,874	\$	2,393,402
Total Diversion & Waste Reduction Expenses																						
Transfer Stations & Out of County Disposal																						
Operations & Environmental Compliance																						
Central Tipping Building	\$	490,292	\$	509,904	\$	530,300	\$	551,512	\$	573,573	\$	596,516	\$	620,376	\$	645,191	\$	670,999	\$	697,839	\$	725,753
Central Tipping Building - Additional Operations	\$	1,492,811	\$	1,552,523	\$	1,614,624	\$	1,679,209	\$	1,746,377	\$	1,816,232	\$	1,888,882	\$	1,964,437	\$	2,043,014	\$	2,124,735	\$	2,209,724
Annapolis	\$	134,768	\$	140,159	\$	145,766	\$	151,596	\$	157,660	\$	163,966	\$	170,525	\$	177,346	\$	184,440	\$	191,817	\$	199,490
Guerneville	\$	291,860	\$	303,535	\$	315,676	\$	328,303	\$	341,435	\$	355,093	\$	369,297	\$	384,068	\$	399,431	\$	415,408	\$	432,025
Healdsburg	\$	620,100	\$	644,904	\$	670,700	\$	697,528	\$	725,429	\$	754,446	\$	784,624	\$	816,009	\$	848,650	\$	882,596	\$	917,899
Sonoma	\$	509,309	\$	529,681	\$	550,868	\$	572,903	\$	595,819	\$	619,652	\$	644,438	\$	670,216	\$	697,024	\$	724,905	\$	753,901
	\$	37,440	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	7,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	45,333	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	95,220	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	\$	5,723,571	\$	6,933,103	\$	7,138,947	\$	7,350,902	\$	7,569,150	\$	9,722,490	\$	10,011,150	\$	10,308,382	\$	10,614,437	\$	10,929,580	\$	11,254,079
Out of County Rail Haul and Disposal																						
	\$	5,723,571	\$	6,933,103	\$	7,138,947	\$	7,350,902	\$	7,569,150	\$	9,722,490	\$	10,011,150	\$	10,308,382	\$	10,614,437	\$	10,929,580	\$	11,254,079
Capital Improvements																						
Central Tipping Building	\$	104,000	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Annapolis	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Guerneville	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Healdsburg	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Sonoma	\$	159,500	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Capital Repairs	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	52,000	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493	\$	60,833	\$	63,266	\$	65,797	\$	68,428	\$	71,166	\$	74,012	\$	76,973
	\$	109,500	\$	54,080	\$	56,243	\$	58,493														

[illegible]