Identify Alternatives

Introduction

Brown, Vence & Associates (BVA) in coordination with Sonoma County staff has identified eleven potential alternatives for handling the County's solid waste stream. These alternatives are divided into those that can be considered short-term (implemented within the next two or three years) or long-term (implemented four or more years into the future). It should be noted that these alternatives are not in any priority order or mutually exclusive and will be used in combination as overall integrated system scenarios to address potential solutions to the County's waste handling issues.

Short-Term Alternatives

Alternative 1 – Exporting of Solid Waste Outside of County

The County is currently using this option to export waste to Potrero Hills Landfill to maintain some in-County landfill capacity. In any scenario chosen in this analysis, exportation of all solid waste for some period of time will be required. Consistent with this assumption, the County is currently preparing a Request for Proposals to obtain out-of-County landfill capacity for the short-term. This assumes that the County will be able to come to agreement with the North Coast Regional Water Quality Control Board (RWQCB) on expansion of the Central Landfill. If the County is unable to develop in-County landfill capacity through expansions or development of a new landfill, solid waste will need to be exported outside the County for the long term. Accordingly, this alternative will be considered as a short-term and a long-term alternative. At a minimum, the following landfills should be considered for transport and disposal of the County's waste based upon available capacity and cost.

- Keller Canyon Landfill
- Potrero Hills Landfill
- Redwood Sanitary Landfill
- Forward Landfill
- Hay Road Landfill (B&J Landfill)
- Lockwood Landfill
- Yolo County Central Landfill
- Clover Flat Landfill
- Kiefer Landfill (Sacramento County)
- Vasco Road Landfill
- Anderson Landfill

In addition, the County should consider the potential risks of exportation of their waste such as price increases, capacity shortfalls, potential transport issues, long-term environmental liabilities and the possibility of total non-acceptance of their waste. In addition to transport and disposal issues, transfer stations may need to be expanded to handle additional throughput.

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

The use of a regional agency, such as a joint powers agency (JPA), has been very effective with the consolidation of solid waste systems and capitalizing on the economies of scale with shared financial responsibilities. While Sonoma County is currently a member of the Sonoma County Waste Management Agency (SCWMA), a JPA, the structure and decision making powers could be strengthened to improve the existing solid waste system. Several opportunities exist for the JPA to take more responsibility for the handling of their waste materials. These include taking a greater financial responsibility, larger ownership share, and additional liability responsibilities in the infrastructure components that make up the system. Many JPAs have adopted very strong flow control agreements within the structure to allow the development and acquisition of long-term disposal and recycling capacity for their members. Some JPA's have purchased solid waste infrastructure facilities from their member jurisdictions, such as landfills and transfer stations to maintain control of their disposal and solid waste handling operations. A "buy-in" by a larger tonnage base can usually translate to savings through economies of scale for all participating members.

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

The County, in cooperation with other participants in the County system, could implement additional local and regional diversion programs to maximize diversion to significantly decrease the tonnage being disposed. AB 939 requires that every jurisdiction reach 50 percent diversion. In response to dwindling landfill resources and resistance to incinerator proposals, communities in California and around the world are planning for 75 percent diversion and zero waste goals. The California Integrated Waste Management Board has also established a zero waste goal as a component of its strategic plan. This alternative can be considered both a short and long-term alternative.

In California, the following communities have adopted zero waste goals: Del Norte County, San Francisco, San Luis Obispo County, and Santa Cruz County. Other communities in California have adopted goals beyond 50 percent, such as: Alameda County (75%) and the City of Los Angeles (75%).

The County and the cities could consider the following programs to maximize diversion:

- **Mandatory source-separation**. Several communities including, San Diego County and each city in the county, have established mandatory source-separation requirements in their municipal codes. All residents and businesses must participate

in the recycling and green waste programs and separate materials into the appropriate containers. According to a survey conducted by San Diego County, 88 percent of county residents support the mandatory recycling ordinance. The City of Stockton has also recently adopted a mandatory source-separation ordinance for both residents and businesses. New York City requires all commercial businesses to recycle from an establish list of materials or face fines of $25 to $500. Some communities, notably the cities of Chicago and Portland, Oregon, require generators to participate in recycling programs. In Chicago, businesses must demonstrate that they are diverting at least three types of materials.

- **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 paper and food waste (when organics processing facility is available) to the landfill ban and conducting more aggressive enforcement of the current ban.
- **Product bans.** Product bans and regulations, including incentives, can be used to influence the public's behavior on purchase and use of certain types of materials. In 1988, the City of Berkeley banned the sale of Styrofoam containers (which led to the nationwide elimination of the Styrofoam clam shell container at Burger King and McDonalds). The City of Pittsburg requires 50 percent of all restaurant take-out containers to be returnable or recyclable. San Francisco is considering requiring take-out containers and utensils to be biodegradable and is also considering a measure that would place a $0.25 surcharge on all grocery bags.
- **Product stewardship**. Local organizing and lobbying efforts can help to influence regulatory product stewardship efforts at the state and federal level, as well as voluntary efforts by manufacturers to ensure the loop is closed, and used products are recycled at the end of their useful lives.
- **Zero waste research and development**. Zero waste research and development options both locally (through Sonoma State University) and other non-local avenues should be investigated.
- **Changing public behavior.** Modifying public behavior to reduce waste generation, reduce disposal of waste and increase diversion is a very important component in maximizing diversion. To a large degree, this goal must be addressed through public education.
- **Source-separated organics**. According to the CIWMB 1999 Waste Characterization Study, nearly 46 percent of the County's residential waste stream and 30 percent of

the County's commercial waste stream is made up of organic materials (food, leaves and grass, branches and stumps, other organics). Many communities, including San Francisco, most cities in Alameda County, and the City of Stockton, have incorporated source-separated organics collection into their green waste diversion programs. The aggressive diversion programs proposed by vendors for the City of Petaluma include diversion of organics to out-of-County composting facilities in Santa Clara and Solano counties. The County may wish to consider expanding its green waste composting program to include source-separated organics or evaluate exporting source-separated organics to compost facilities in other counties to the extent that capacity is not available in Sonoma County.

- **Wet-dry collection**. An emerging strategy for diverting more materials, particularly for the commercial sector, has been the development of wet-dry collection systems. In San Jose, over 500 businesses are on a wet-dry collection route. The dry fraction includes source-separated recyclables, including cardboard, glass and plastic 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). The advantage to this system is that the individual businesses achieve very high diversion rates, as much as 85 to 95 percent diverted and the collection system is simplified to two containers and two trucks instead of three containers and three trucks. A disadvantage to this system is that it requires a significant investment in pre-processing at the compost facility and may produce a lower quality compost product. The cities of Woodside and Portola Valley have implemented wet-dry collection for both their residential and commercial customers.

This alternative would have to be implemented in combination with one or more disposal alternatives to handle residual waste that have no recycling or composting value.

Alternative 4 – Expansion of the Central Disposal Site

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, as described in the existing closure plans in the current Joint Technical Document, the Central Disposal Site could provide capacity until approximately 2012 to 2014, depending on the rate of refuse inflow. This alternative was considered a short-term option, as the County is currently in discussions with the RWQCB regarding some of these expansions for immediate consideration.

East Canyon

The East Canyon is located on the eastern flank of the original landfill, south of the existing administrative office and entrance road, which are south of the public tipping building and recycle center. The East Canyon Expansion consists of five phases, which are planned to

have an estimated total capacity of seven million cubic yards. The first four phases require approximately 40 acres of liner construction over prepared native sub grade. The fifth and final phase is planned to extend from the top of Phases I through IV and would overlap onto the existing Central Landfill. The RWQCB has indicated that a liner would be required to separate the landfill units where the Phase V overlaps the original landfill, which would be an area of approximately 14 acres in plan view.

The total estimated waste capacity of the East Canyon is approximately seven million cubic yards, for which only about 20 (Phases I and II) of the planned 40 acres have been permitted and constructed. Phases I and II provide approximately 2.2 million cubic yards of gross air space. County staff estimate that the remaining capacity as of September 2004 to be approximately 645,000 cubic yards. County staff also estimates that the East Canyon will be exhausted of its capacity by approximately July 2005 at current fill rates.

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 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 Rock Extraction Area is located on the west side of the existing landfill. The Rock Extraction Area expansion covers approximately 8 acres of native ground and up to about 20 acres of overlap onto the existing Central Landfill. Rock and soil was previously excavated from the native ground portion of this area. The conceptual plan for the Rock Extraction Area includes a double composite liner over existing waste as well as native soil materials. The total estimated waste capacity of the Rock Extraction Area is approximately 2 to 2.5 million cubic yards. By using the County's assumed landfill density, the tonnage of waste that could be placed in the Rock Extraction Area is approximately three years of capacity. At the present time, a siting study and construction drawings and specifications are in progress. Full documentation for permit applications for regulatory submittals are in progress and not planned for submittal until the end of 2004. Therefore, there are no permits in place for this expansion at this time, although 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. This portion of the landfill is approximately 30 acres. Although we have not observed any grading plans for the North Expansion Area, County staff report that the area can hold approximately two million cubic yards of capacity, equaling approximately two years of site life. 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 8 million cubic yards of additional landfill capacity may be realized. At the historical flow rate of approximately one million cubic yards of capacity per year, the proposed Central Disposal Site expansions represent approximately eight 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. At the present time, however, due to lack of permits, the Central Disposal Site currently has until July 2005 of permitted waste capacity.

Alternative 5 – Subregional Waste System

One option for the County and a few of the smaller jurisdiction is establishment of a subregional waste system to develop and maintain a solid waste infrastructure to handle its own waste. Under this scenario mandatory collection of waste and flow control agreements with participating jurisdictions would be required. This alternative might include closure of most of the existing transfer stations. It is also likely that the landfill will need to be closed and waste exported outside of the County due to potentially high costs to operate a Subtitle D landfill. The overall cost, liability, regulatory requirements, and system management would need to be reduced. An analysis of the steps, schedule and cost for this alternative are necessary. If the County is unable to develop additional in-County landfill capacity, there is a possibility that the alternative could be implemented in the short-term. However, since it is always difficult to predict future events, this alternative could also be considered as a long-term alternative.

Long-Term Alternatives

Alternative 6 – Development of West Expansion Area

The West Expansion Area of the Central Landfill in Sonoma County is estimated to cover approximately 114 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 conceptual expansion plan consists of dividing the area into 8 modules, with Modules 1 through 7 outside of the current waste placement area. Module 8 would extend from the base footprint of the West Expansion and overlap portions of the existing Central Landfill. The RWQCB has indicated that the overlap would require a liner to separate the waste management units. Module 8 may require some rock excavation at the interface between the landfill footprints. 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.

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

Another option to obtaining additional landfill capacity within the County is the siting, development and construction of a new in-County long-term landfill. Since the siting, CEQA, and permitting process is quite lengthy, in some cases up to 10 years, this alternative should be considered long-term in nature. The process to develop the landfill includes identification of potential sites, review and analysis of the appropriateness of the site, availability and acquisition potential for the site, the CEQA process, permitting, development and finally construction. The main considerations include: 1) are there potential sites available within the County that meet physical and environmental constraints, 2) can a landfill be reasonably sited within the County considering public and political concerns, 3) what is the length of time it will possibly take to site a landfill in the County, 4) is there support from all or most of the JPA members for siting and use of this landfill, and 5) what is the estimated cost for development. Consideration of a new site must include adequate sizing to allow at least several decades of future capacity at the maximum waste stream assumptions.

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

The existing County System could be expanded into a Multi-County Regional System through negotiations with surrounding counties to import additional waste into the current system. This would increase the amount of waste handled by the region and allow opportunities for cost savings through economies of scale. We have identified four near-by/adjacent counties to assess interest in joining a regional system. These include Mendocino County, Napa County, Humboldt County and Del Norte County. All of these counties lie along the highway 101 corridor for easy transportation access, except for Napa County which adjacent to the east. Options for handling the regional waste stream would parallel alternatives discussed above including development of a new landfill or expansion of an existing landfill, either in Sonoma or one of the other counties, negotiating a better deal for out-of-county exportation, etc.

Alternative 9 – Regional Cooperation to Develop a Materials Recovery Facility to Handle Recyclables

There is a need to address the capacity of processing the region's recyclable materials. Currently, only North Bay Disposal Corporation and Empire Waste Management operate Materials Recovery Facilities (MRFs) within Sonoma County. North Bay Disposal Corporation is attempting to develop a MRF in Santa Rosa to handle curbside collected single-stream mixed recyclables, construction and demolition wastes and some other mixed loads of refuse. The total capacity of these MRFs needs to be reviewed for consistency with the needs of the Cities and County within Sonoma. Will their proposed capacity meet the County's need? If not, another MRF with greater capacity needs to be developed to handle

and divert a larger portion of the waste stream. The MRF could be developed and owned by the County, the JPA, or a private entity. Likewise the MRF could be operated by the County, the JPA, or a private entity. There are many types of MRFs to handle the various waste streams generated. The MRF could process mixed refuse (dirty MRF) or source separated materials such as recyclables (clean MRF) or both. The MRF could contain a highly mechanized process or a very simple manual labor sorting process. There are many types of MRFs operating in California, the US, and the world. A MRF consistent with the County's waste generators, collection system, and materials market infrastructure will need to be selected.

Alternative 10 – Development of an Organics Processing Facility

The County has initially explored the benefits of constructing an organics processing facility. This facility would utilize new technologies such as gasification or anaerobic digestion to handle the organics collected in the County (with the exception of green waste collected from the residential curbside program). The process of each technology is described below.

Gasification converts organic waste material to a gaseous fuel called a synthesis gas (syngas). The gasification process consists of three major components: gasifier, heat recovery and purifier, and energy converter. For example, solid organic material is fed to an indirectly fired gasifier which produces a high temperature gas. The syngas is fed to a heat recovery unit and purifier which cleans up the gas and lowers the temperature sufficient for input to an energy conversion device such as a fuel cell or gas turbine. This scheme lends itself well to cogeneration of electricity and production of steam or hot water through the heat exchange process.

Anaerobic digestion is a biological process that produces a gas principally composed of methane (CH4) and carbon dioxide (CO2) otherwise known as biogas. These gases are produced from organic wastes such as livestock manure, food processing waste, etc. The process of anaerobic digestion consists of three steps. The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar. The second step is the conversion of decomposed matter to organic acids. And finally, the acids are converted to methane gas.[1]

Either of these technologies or a similar process for converting organic wastes to energy could be suitable for Sonoma County. The cost, permitting, and schedule for implementation and operating history at full scale will need to be identified.

[1] Defined by the California Energy Commission
http://www.energy.ca.gov/development/biomass/anaerobic.html

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

The consolidation of solid waste systems has increased the amount of private company investment in developing, constructing and owning facilities. The County, in this alternative, could look at selling all or a portion of their solid waste system to a private entity. The first step is identification of the possible saleable components of the system; the overall process would take several years to implement. The potential for privatization of the County's system, including ownership and operation by private industry of the landfill, transfer stations and other waste related facilities needs could signal potential cost savings, and reduction of responsibilities and potentially some long-term liabilities. However, privatization could also allow future potential risk through loss of control over the capacity and costs of the system components. Both benefits and risks to the County and other member jurisdictions need to be considered in the analysis of potential privatization.