May 27, 2010

Dave Bryant
Div. Manager - Special Projects
Tulare County Resource Management Agency
5961 S. Mooney Blvd.
Visalia, CA 93277

Re: Comments on the Tulare County Draft Climate Action Plan as part of the Re-circulated Draft Environmental Impact Report of the General Plan 2030 Update

Dear Mr. Bryant:

Edgar & Associates, Inc. represents Pena's Material Recovery Facility & Transfer Station (Pena's) regarding future planning, permitting and regulatory compliance matters in Tulare County. Currently, Pena's is proposing an expansion of its facility in an effort to address the growth in the region, and the waste and recycled materials that are inherent to that growth. Additionally, the expansion will place Pena's MRF & Transfer Station at the forefront of compliance with AB 32, the California Global Warming Solutions Act of 2006. The AB 32 Scoping Plan adopted a series of measures which has explicitly tasked California with implementing new goals to expand mandated commercial recycling capacity, promote organic feedstocks such as food waste processing for compost and anaerobic digestion facilities (as listed below), and generate renewable energy.

Recycling and Waste Sector Recommendation - Landfill Methane Capture and High Recycling/Zero Waste (MMTCO2E in 2020)

Measure No.	Measure Description	MMTCO2E Reductions
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane • Increase the Efficiency of Landfill Methane Capture	TBD
RW-3	High Recycling/Zero Waste • Mandatory Commercial Recycling • Increase Production and Markets for Organics Products • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	 5 2 2 TBD TBD
	Total	10

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Pena's MRF was designed to serve the Northern Tulare County region to meet AB 939 recycling mandate to achieve a 50% landfill diversion by 2000 and continual that diversion level thereafter. Pena's Disposal and the MRF have a proven record of performance for AB 939 and are poised to expand to reach the AB 32 challenge. The Pena's MRF proposes to provide mandated commercial recycling processing capacity for the region and produce organic feedstock as required in the AB 32 Scoping Plan, and generate renewable energy in the process.

The Project will greatly assist the Tulare County Consolidated Waste Management Authority to exceed the recycling goals and reduce their carbon footprint to 1990 levels by 2020, and provide the community with critical technological components to achieve energy, economic, and environmental sustainability. The following components are proposed to be part of the Pena's MRF Expansion and meet the needs of the draft Climate Action Plan. A copy of the Draft Project Description is attached.

- Increase the tonnage to meet the needs of AB 32 and the General Plan Update to 2030.
- Expand programs to accommodate the AB 32 mandate of providing commercial recycling to all business and multi-family units.
- Expand the outdoor green waste processing operations to allow the processing of co-collected residential green waste with food waste, to produce compost feedstock and/or anaerobic digestion feedstock.
- Explicitly include the processing of commercial food waste inside the MRF building to produce compost feedstock and/or anaerobic digestion feedstock.
- Explicitly include the addition of solar panels on top of the MRF building.
- Add a 1 mega-watt wood waste biomass gasification plant.
- Calculate the carbon footprint for baseline operations and the proposed project.

The County of Tulare is in the processing of updating their General Plan to 2030, which includes a Climate Action Plan. The following measures are being proposed for the Solid Waste Reduction and Recycling and Agriculture sectors:

- Encourage the use of recycled materials in its own operations and purchases
- Provide sites and publicity for recycling events
- Work with recycling contractors on innovative programs to encourage residents and business to take advantage of recycling services
- Reduce agricultural burning though cogeneration and composting

Pena's supports the endeavors made by Tulare County to address Climate Change through its Draft Climate Action Plan. Edgar & Associates hereby offers the following comments on Pena's behalf regarding the recent Draft Climate Action Plan that has been issued as part of the Tulare County Re-circulated Draft Environmental Impact Report.

5.1.4 – Solid Waste Reduction and Recycling

Pena's is in support of the Solid Waste Reduction and Recycling Measures that are included in this section, and notes that the measure to 'work with recycling contractors on innovative programs to encourage residents and business to take advantage of recycling services' is currently part of the culture at Pena's, and is embedded in the proposed MRF expansion, and meets the mandates set forth by AB 32, where commercial recycling will be mandated throughout California. Pena's believes that the County of Tulare should take further advantage of the existing business recycling infrastructure that supports business recycling, and additionally, make room for its inclusion in the RDEIR as a mandated goal set forth from AB 32.

Pena's believes that the draft Climate Action Plan could be stronger with the specific diversion of organic materials (green waste and food waste) into composting in order to produce products that have a multitude of benefits to agriculture, such as water conservation, erosion control, disease suppression, and increased yield.

6.1 - Agriculture

Pena's is in support of the County's support of agriculture and wishes to see the County expand the projects and initiatives that go beyond just reducing agricultural burning, and promote compost facilities that also use urban waste such as green waste and food waste, to promote the value of compost to the agricultural community.

Edgar & Associates also works with composting companies in Napa County where a Climate Action Framework in now under discussion. Being a rich agricultural county like Tulare County, the Napa Community Draft Review Plan contains a series of distinct measures to "Reduce Consumption and Solid Waste" as well as "Conserve Agriculture, Natural Resources, and Urban Forest.". A copy of their draft plan is attached as a framework of ideas of how waste by-products can be tuned into compost for the benefit of agricultural, and as a means to reduce greenhouse gases.

We appreciate the opportunity to comment on the Climate Action Plan. Should you have any questions, please call me at (916) 739-1200.

Sincerely,

Evan W.R. Edgar, Principal

community review draft

napa countywide community climate action framework

December 2009

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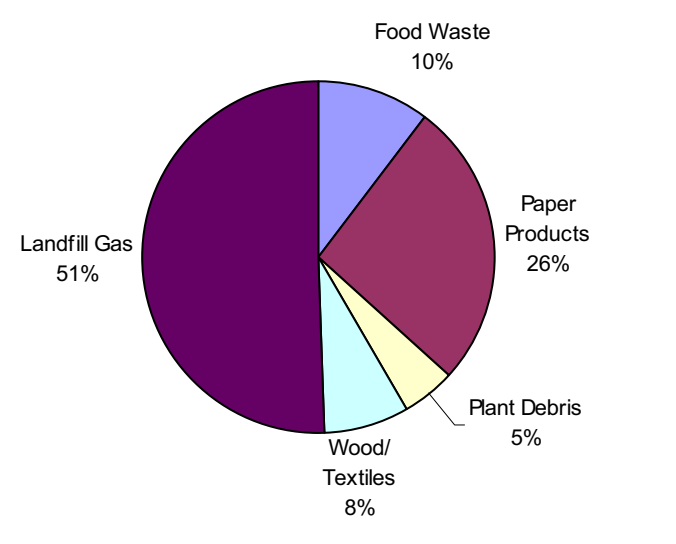
Bay Area Air Quality Management District (BAAQMD), Napa County Transportation and Planning Agency (NCTPA), Napa Valley Community Foundation, and the Cities of American Canyon, Calistoga, Napa, St. Helena, Yountville, and the County of Napa.

Goal 3. Reduce Consumption and Solid Waste (SW)

Direct greenhouse gas emissions in the solid waste sector come primarily from anaerobically decomposing organic material in landfills (such as food scraps, yard debris, and paper) that produce methane and carbon dioxide. Significant quantities of indirect emissions are also connected to mining, manufacturing and transport of products and packaging. Substituting recycled materials for virgin materials in the manufacturing process reduces the GHG emissions, sometimes dramatically as in the case of aluminum, and less so with other materials, like glass.

Community Waste Greenhouse Gas Emissions 2005



Landfill gas and paper products are the major waste sources of greenhouse gases in Napa County.

GHG emissions from solid waste are reduced by removing organic waste from the wastestream prior to landfill by diverting organics to composting or other recycling efforts, and by managing emissions from landfills. At a minimum, burning landfill gas in a flare reduces GHG impacts from methane. Even better is using the landfill gas as a fuel for electric power generation. This energy source can increase the renewable fraction of the community energy supply and reduce the need for energy produced from fossil fuels.

Solid waste produced by Napa County in 2005 accounts for 54,209 tons of GHG emissions, equal to 4.7 percent of the County's total GHG emissions.[32]

Napa County's solid waste is currently disposed at two locations, the Keller Canyon Landfill in Contra Costa County and the Clover Flat Landfill near Calistoga. The area served by the Clover Flat Landfill is essentially the same as the area of the Upper Valley Waste Management Agency, with about 20% of the county's waste buried there annually. The remaining 80% of Napa's waste is currently transferred from the Devlin Road Recycling & Transfer Facility to the Keller

[32] Napa County ICLEI 2005 Inventory

Canyon Landfill site. Both sites have landfill gas recovery systems that are estimated by the USEPA to be approximately 75% effective in recovering and controlling emissions of landfill gas.[33]

In 2009 the Keller Canyon Landfill installed a landfill gas-to-energy plant to generate electricity and is therefore productively utilizing Napa County's and other North Bay communities' waste.

In contrast, the Clover Flat Landfill only flares the gas collected from the landfill. Based on industry experience and communication with Upper Valley Disposal & Recycling Company, owner of the Clover Flat Landfill, this facility may now be generating enough landfill gas to enable installation of a landfill gas-to-energy plant that could produce a significant amount of GHG-free electricity..[34] This possibility merits serious study and follow up.

Methods to Reduce Waste

Modern solid waste management uses a hierarchy of approaches in order of greatest to least environmental and climate benefit:

- First—**REDUCE** the amount of waste created through efficient use of resources, more durable products, less packaging, buying less stuff, etc.
- Second—**REUSE** products and packaging as much as possible, i.e., thrift stores, coffee mugs instead of single-use cups, reusable produce crates/pallets, etc.
- Third—**RECYCLE** discards, including products, packaging, and organics (through composting).
- Finally, after doing all the above, landfill what's left, and then collect and use the landfill gas productively through energy production.

From a climate protection perspective, the ideal is to reach "zero waste" where nothing is landfilled and no fossil fuel is used to manage or transport waste. This is a concept equivalent to natural biological processes where the "wastes" from one organism are "food" for others, in a continuous cycle, or more accurately, an interconnected web.

Collecting, processing and burying municipal solid waste in landfills requires a significant amount of energy. Emissions from these activities are compounded by subsequent emissions of landfill gas. Although proper management of landfills can significantly reduce the impact of these gas emissions, landfills still release some methane, a very potent greenhouse gas. An effective method for reducing landfill methane emissions is by reducing the organic fraction of the waste being buried. These organics can be composted to create soil amendments or used as a fuel for energy production.

Objective SW1: Achieve overall waste diversion of 75% to 90% by 2020.

The actions described below will achieve overall waste diversion by:

- Increasing overall diversion rates
- Reducing the amount of waste generated

[33] http://www.epa.gov/lmop/faq-1.htm
[34] Conversation between Ken Wells, consultant for CPC, and Bob Pestoni, owner, UVDS on Sept. 11, 2009.

- Reusing products and packaging
- Recycling or composting discards

Increasing Overall Diversion Rates

Diverting waste minimizes the land required for disposal sites for solid waste. Waste in landfills affects groundwater and soil; waste diversion from landfills supports clean and productive land. When waste is diverted, the environmental impact is reduced. Construction waste, demolition and organic wastes contribute a high volume of material to landfills. Recycling and composting such material can reduce the overall volume of waste added to landfills every day, while providing resources for other economic sectors. Reused construction waste and compost, for example, can act as a valuable commodity for construction companies, salvage yards and nurseries.

ACTION SW1.1: Enact ordinances and create incentives to increase construction and demolition debris waste diversion from 75% to 90% by 2020.

Additional Opportunities

Additional opportunities to increase overall diversion rates include:

- Enact mandatory recycling ordinances and provide financial incentives to increase residential, commercial, and construction and demolition debris recycling.
- Require multi-tenant commercial/residential building owners/managers to provide on-site access to recycling and composting containers/service.
- Create and support other collaborative and regional programs, such as the Napa County Green Business Program, environmentally preferable purchasing policies and joint-purchasing agreements among all local jurisdictions, to support the 75% or more overall waste diversion goal.
- Implement an intensive social marketing program to address barriers to recycling behaviors and promote resource conservation.

Reducing the amount of waste generated

Actions to reduce the amount of waste generated are primarily focused on shifting consumption behaviors to less GHG-intensive products. These regulatory tools, education efforts, and economic incentives are intended to create long-term changes in consumer behavior. Therefore, establishing short-term potential greenhouse gas reduction estimates is very speculative. The costs related to these actions are ongoing and primarily for staffing and various types of communications. The social marketing aspects of this action can be integrated into the recycling education efforts described above.

Ordinances and incentives that could reduce waste generated include:

- Encourage the efficient use of resources through buying less stuff, more durable products, and less packaging.
- Reduce the volume of organics handled by the solid waste collection system through on-site agricultural, commercial and residential composting which reduces the emissions

associated with moving this material from the generator to the compost facility or disposal site, as well as the emissions generated by production of synthetic fertilizers that can be offset by use of organic soil amendments.

- Support legislation and other efforts at local, state and federal levels that extends producer responsibility for managing their products and packaging at the end of their intended use.
- Encourage purchasing locally manufactured products.
- Provide criteria for purchasing locally produced items with recycled content.
- Educate residents and businesses on purchasing decisions. Identify and display the carbon emissions of products.
- Eliminate, through local ordinance, the use of non-recyclable takeout food containers.

ACTION SW1.2: Enact ordinances and create incentives to achieve organic (food and green) waste diversion of 75% by 2020, including waste diversion from restaurants and special events.

Reusing products and packaging

Reuse is a means to prevent solid waste from entering the landfill and to distribute discarded products to those who want them. In many cases, reusing products and packaging supports local community and social programs while providing donating businesses with tax benefits and reduced disposal fees. The Napa County Recycling and Waste Services have inaugurated a pilot program for commercial food composting involving 8 local restaurants, caterers and stores, some of which now divert 100% of their food waste from land fills.

Reuse requires fewer resources, less energy, and less labor, compared to recycling, disposal, or the manufacture of new products from virgin materials. Reuse strategies and programs provides an alternative to other waste management methods since it reduces air, water and land pollution, and limits the need for new natural resources.

ACTION SW1.3: Create and support other programs, such as the Napa County Green Business Program, that help achieve the 75% to 90% overall waste diversion goal.

ACTION SW1.4: Adopt environmentally preferable purchasing policies and explore joint-purchasing agreements with partner agencies, and local jurisdictions and businesses.

Recycling or composting

Recycling and composting actions are primarily focused on removing organic wastes that have higher immediate greenhouse gas impacts than other waste types. Revenue to cover the costs for this action set can be collected in a number of different ways, most commonly through refuse collection rates and user fees, although franchise fees on waste haulers, landfill host fees and AB 939 fees can also be utilized. In order to divert 75% of the overall Napa County wastestream, about 40% (70,000 tons) of the 177,000[35] tons of wastes still going to landfill need to be diverted.

[35] CIWMB 2005 Diversion/Disposal Rate Reports, see Appendix I.

By applying the California Integrated Waste Management Board's (CIWMB) 2003 California waste characterization data[36] to Napa's waste quantities, we can assume that 30% of Napa's waste going to landfill is organic. Of this compostable fraction, diverting two thirds of this from the landfill would represent about 35,000 tons per year or 100 tons per day of additional compost feedstock which can be composted or used as an energy source in an anaerobic digester. Applying the USEPA WARM tool to this type and quantity of organic waste results in a 3,700 ton per year reduction in greenhouse gas emissions (see calculation in Appendix I) from the solid waste sector attributable to Napa.

ACTION SW1.5: Establish collection services in all cities for segregated food waste from commercial sources and establish a local food composting facility.

ACTION SW1.6: Encourage home composting of organic waste.

Costs and Funding Opportunities

Funding and financing for the solid waste sector offer some special opportunities for local governments. User fees on waste generators to fund recycling education and other diversion efforts can be implemented by local jurisdictions—without going to a public vote—in a number of different ways, including collection rates, franchise fees on waste haulers, landfill host fees and AB 939 fees. Additionally, energy programs using solid waste and landfill gas are considered renewable energy sources, and are eligible for California and federal rebates, tax incentives and special financing.

Increasing Overall Diversion Rates

Increasing overall diversion rates is primarily focused on removing typical recyclables from the waste going to landfill. By recycling these materials and using them to replace virgin materials, significant GHG emissions are avoided. Although the reduced GHG emissions are substantial, much of the savings are indirect and accounted for in transportation and other savings. Costs for this action set can be collected in a number of different ways, including waste collection rates, franchise fees on waste haulers, landfill host fees and AB 939 fees. In order to divert 75% of the overall Napa County wastestream, about 40% (70,000 tons) of the 177,000[37] tons of wastes still going to landfill need to be diverted. By applying the CIWMB's 2003 California waste characterization study to Napa's waste quantities, we can assume that 40% of the wastestream is recyclable paper, metal, plastic and glass. Of this recyclable fraction diverting one-half (20% of the total waste stream) would represent about 35,000 tons per year or 100 tons per day of additional recyclables. Applying the USEPA WARM tool to this type and quantity of mixed recyclables results in a 90,000 ton per year reduction in Scope 3 greenhouse gas emissions (see report in Appendix I).

Reusing Products and Packaging

Reusing products and packaging requires staff time and communications, education and community outreach to maximize diversion opportunities.

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[36] http://www.ciwmb.ca.gov/Publications/LocalAsst/Extracts/34004005/Tables.pdf

[37] EPA's Global Warming—Waste, "Measuring Greenhouse Gas Emissions from Waste" http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html, see Appendix I for calculations.

The social marketing and community outreach aspects of this action should include other resource conservation behaviors. Educational cost estimates are based on spending $5 per household per year above current recycling educational expenditures. With about 50,000 households in Napa County an annual outreach budget of $5 per household is $250,000. This funding level provides one to two contacts per household per year.

Regulations establishing economic incentives to reduce waste and encourage reusable packaging are more efficient when enacted at the state or federal level; however this action set can be used as a local action. If implemented locally, it should be considered a regional approach to avoid other unintended economic impacts, such as shifting consumer purchase patterns from one community to another. Due to the diffuse and indirect greenhouse gas impacts from this action, establishing a potential greenhouse gas reduction estimate is very speculative. The cost of the social marketing aspects of this action can be integrated into the recycling education efforts described above.

Recycling and Composting

Based on other similar programs such as Jepson Prairie Compost in Yolo County and Sonoma Compost in Sonoma County, mixed organics can be processed into compost for about $40/ton, with an annual cost of about $1.4 million. With offsetting savings from reduced landfill tipping fees, this program could result in little to no net cost increase. Funding necessary for the collection and processing of the organics can be obtained with solid waste collection fees.

In order for this program to increase organics diversion and composting beyond the levels already achieved, focused efforts are necessary to inform and increase participation by residents and businesses. These outreach efforts to increase organics diversion can be combined with other waste recycling goals for a more cost-effective outreach effort. Educational cost estimates are based on spending $5 per household per year above current recycling educational expenditures. This cost is included with Action SW1.1.

Emissions Reduction Summary – Reduce Consumption and Solid Waste

Solid Waste	Implementer	Feasibility	Potential tons GHG reduced by 2020

Objective SW1. Achieve overall waste diversion of 75% to 90% by 2020.			
Increasing overall waste diversion (Action SW1.1)	UVWMA, N-VWMA, County, cities	Moderate	90,000 tons/year (reductions not counted toward target)
Reducing the amount of waste generated (Action SW 1.2)	UVWMA, N-VWMA, County, cities	Easy to Difficult	To be determined
Reusing products and packaging (Action SW1.3)	UVWMA, N-VWMA, County, cities	Moderate	To be determined
Recycling or composting (Action SW1.5, SW1.6)	UVWMA, N-VWMA, County, cities	Moderate	3,700 tons/year (reductions not counted toward target)

Goal 4. Conserve Agriculture, Natural Resources, and Urban Forests (AN)

Globally, about 25 to 30 percent of annual GHG emissions are due to deforestation. The carbon dioxide sequestered in soil, trees, and other vegetation is released into the atmosphere when land is converted to other uses, including agriculture. While the agriculture and forest sectors represent less than 4 percent of GHG emissions in Napa County, they have the potential, with new practices, to act as a sink, tying up or sequestering GHG emissions from the atmosphere in the form of soil and wood carbon.

Agriculture

Agricultural areas are widespread throughout the County, with vineyards and rangeland countywide. Of Napa County's approximately 485,000 acres, 51,000 acres (or 10.5 percent of the total area) are active agricultural lands consisting primarily of vineyards with smaller areas of crops and orchards. The County has approximately 53,800 acres of existing grazing land.[38] Additionally, acreage under vineyard cultivation is expected to continue to grow in Napa County, with an additional 10,000 acres projected by 2030.

While Napa County is known for its wine grape growing, a small variety of agricultural crops are also grown, including walnut and olive orchards, strawberries, artichokes, among others.[39] Agriculture is the leading source of revenue for Napa County.

Total GHG emissions from the agricultural sector are a result of a complex network of sources including livestock, agricultural equipment, fertilizer application, soil tillage, crop residue burning, land conversion for agricultural use, processing, refrigeration, and distribution.[40] For this reason, calculating the GHG emissions from the agricultural sector of Napa County is more demanding than for other sectors in this Framework.

Given this complexity of calculations, agriculture emissions for Napa County are not determined except for the CO_2 equivalent emissions from tractors and other farm equipment. In 2005, the BAAQMD estimated these emissions at 33,046 metric tons, which is approximately 3% of the total countywide GHG emissions.

In general, methane gas from livestock and manure is 23 times more potent than CO_2 and therefore can be a significant contributor of GHG emissions. In Napa County, however, given the very small number of livestock (approximately 9,000),[41] the methane gas is considered insignificant. The Napa County General Plan Environmental Impact Report (EIR) explored four land use scenarios for future development in the County. Each scenario evaluates environmental impacts resulting from projected development. The scenarios range from a minimum development, or "No Build," scenario to a "Build Out" scenario. Ultimately, the Draft

[38] Napa County Baseline Data Report, Chapter 10, Agricultural Resources.
[39] Napa County Baseline Data Report, Chapter 10, Agricultural Resources.
[40] Winery emissions related to fermentation are not relevant to this analysis since only use of ancient carbon related emissions are considered.
[41] US Department of Agriculture. *2007 Census of Agriculture: Napa County California.* Available online at: www.agcensus.usda.gov

EIR determined that less future development will promote future GHG emission reduction goals.[42]

The proposed actions will not only reduce emissions from current agricultural practices, but will also act to remove and sequester carbon dioxide from the atmosphere. That is, the actions move toward a net reduction of atmospheric carbon dioxide. This is a feature that makes agriculture and forestry unique: they can act as carbon "sponges" to soak up carbon dioxide. So these actions not only reduce emissions to zero, they go "beyond zero" to create carbon sinks.

One-sixth of GHG emissions from agriculture are from burning or fossil fuels to run machinery and vehicles. If other aspects of the farming industry are incorporated, such as food production and transportation, agriculture is associated with almost one-quarter of US emissions.[43] The farther food travels to Napa's cities and county from its source, the more fossil energy is expended and the more carbon is released into the atmosphere. Researchers estimate that it takes about 10 calories of fossil energy to put one calorie of food on our plates in North America. About 70 percent of these calories are dedicated to transportation and processing.[44]

Organic and local food practices, however, produce less energy to maintain, produce fewer GHG emissions, avoid the use of chemical fertilizers and are more resilient in the face of drought of any kind, including that brought on by climate change.[45] Sustainable agriculture and localized food systems have the potential to mitigate nearly thirty percent of global GHG emissions and save one-sixth of global energy use.[46]

Woody and herbaceous plants, manure, and algae (or biomass) generates energy when burned that can be used directly as heat or can be converted into electricity. Some types of biomass can be used directly as heat or can be converted into electricity. It is considered a carbon neutral energy source.[47]

Agricultural Waste Strategies

Agricultural "waste" is a resource that can be used to create additional revenue, increase soil health, and increase yields.

- Create on-farm and centrally located facilities to process all residential "green can" waste, as well as equestrian and agricultural waste.
- Explore feasibility of processing this waste in anaerobic digesters and use in energy production and soil management.

[42] Napa County. *Napa County General Plan Draft Environmental Impact Report.* February 2007.
[43] Climate Action Project. *Agriculture and Rural America.* October, 2008. Available online: www.climateactionproject.com.
[44] Pimentel, David and Marcia H. Pimentel. *Food, energy, and society.* Boca Raton, Florida: CRC Press, 2008.
[45] *Regenerative Organic Farming: A Action to Global Warming*. LaSalle, T., Ph.D. and Hepperly, P., Ph.D. 2008 Rodale Institute. www.rodaleinstitute.org/files/Rodale_Research_Paper-07_30_08.pdf
[46] Ho, Dr. Mae-Wan and Lim Li Ching. *Mitigating Climate Change through Organic Agriculture and Localized Food Systems.* ISIS Report 31/1/08
[47] ICLEI – Local Governments for Sustainability. Biomass Technologies.

Objective AN1: Encourage responsible and sustainable agricultural and landscaping practices.

Actions described below will encourage responsible and sustainable agricultural and landscaping practices by:

- Supporting local agriculture, food production, and community gardens
- Promoting water conservation

Supporting Local Agriculture, Food Production, and Community Gardens

ACTION AN1.1: Adopt policies and ordinances that support local agriculture, food production, and community gardens. Support efforts by local growers and restaurants to produce and use locally grown food products, and remove associated regulatory hurdles.

ACTION AN1.2: Support efforts by local growers and restaurants to produce and use locally grown food products and remove associated regulatory hurdles. (See also T10 and AN1.)

Promoting Water Conservation

ACTION AN1.3: Adopt water efficient landscape ordinances that promote climate-appropriate plants, efficient irrigation, and non-potable water sources.

Natural Resources

Water is a valuable natural resource in Napa County. Many of the areas in the eastern regions of the county have very limited water resources, and in some areas where there is water, the boron concentration is quite high and too high for crop production.[48] There are a total of 22,431 acres of water in the county, or 4.43 percent of the total land.[49] Suitable climate and an irrigation water source will likely continue to support future conversion of land.

Access to clean water, energy, mineral resources, and availability of productive land are all threatened by changes in climate. The warmer winter and spring temperatures of recent years could adversely affect the capacity and reliability of the California water system with respect to water shortage and flood management, and requires changes in water reservoir management rules.

Urban water conservation, reclamation and reuse of water, land and water use, and drainage management protect and conserve valuable water resources. Water reclamation systems provide an exemplary infrastructure to use water efficiently. Gray water is tap water soiled by use in washing machines, tubs, showers and bathroom sinks. It is not sanitary, but it is also not toxic and generally disease free. Gray water reclamation is the process by which households make use of gray water's potential instead of simply piping it into overburdened sewage systems with all water that travels down the drain.

[48] Napa County Baseline Data Report, Chapter 10, Agricultural Resources.
[49] Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

Reducing water used outdoors can make the biggest difference in saving water in Napa County. Water efficient landscaping opportunities include: water-efficient irrigation systems and climate appropriate plants and trees. These design decisions are based on the following principles: proper planning and design, soil analysis and improvement, appropriate plant selection, practical turf areas, efficient irrigation, use of mulches and appropriate maintenance.[50]

Benefits of this type of landscaping include: conservation of natural resources, decreased energy use, and reduced runoff and irrigation water that carries top soils, fertilizers and pesticides into lakes.

Objective AN2: Reduce water use and protect local water resources.

Actions described below will reduce water use and protect local water resources by:

- Reducing demand of potable water and developing water service and infrastructure

Reducing demand of potable water and developing water service and infrastructure

ACTION AN2.1: Develop and implement water conservation plans that include financial incentives, educational programs, and ordinances that reduce the per capita demand of potable water.

ACTION AN2.2: Develop and enhance recycled water service and infrastructure to serve all areas of Napa County.

Financing Options

Also known as Mello-Roos, Community Facilities District Funding provides a means through which local government agencies obtain funding for public improvements, such as water and wastewater systems, roads, schools, etc. The district sells bonds to finance the improvements, and taxes from real property owners in the district pay off the principal and interest on the bonds. Formation requires two-thirds majority vote of residents within the boundaries of the district. These bonds can pay for facilities that transmit and distribute potable and nonpotable water.

In addition to Community Facilities District Funding, the California Department of Water Resources provides grants annually for water use efficiency projects. The Bay Area Air Quality Management District periodically provides grants to help fund climate protection programs and policy development projects in the Bay Area. The Community Foundation provides funding, as well, to communities who are interested in exploring innovative planning projects and processes.

Forests

Forests and urban trees reduce atmospheric carbon dioxide (CO_2) through sequestration and other greenhouse gases by conserving energy used for space heating and cooling. Carbon

[50] US Environmental Protection Agency. *Water-Efficient Landscaping: Preventing Pollution and Using Resources Wisely.*

sequestration is the process by which CO_2 is transformed into above- and below-ground biomass and stored as carbon.

Conversion of forestland to development and agriculture releases CO_2 and also diminishes the future capacity of the forest to remove CO_2 from the atmosphere. As mentioned in other sections of this Framework, current projections indicate that lands in vineyard cultivation will increase significantly in the next 20 years, although it is not clear how much of this additional vineyard land will be converted from forest land. The County has roughly 40,000 acres of land that is capable of growing timber, with 30,000 acres that are currently functioning as timberland.[51] Commercial timber species include Coast Redwoods, Incense Cedar, Douglas Fir, Western Red Cedar and Jeffrey Pine, among many others.

These lands can be conserved to minimize the CO_2 emissions associated with conversion of timberland to other uses, such as vineyards. Additionally, land can be restored and managed to remove additional CO_2 from the atmosphere, while also providing wood products and many other public benefits. The proposed actions to preserve, restore, and manage the County's forestlands and change impactful agricultural practices will result in minimizing emissions and maximizing carbon uptake.

By fostering and restoring forests and other terrestrial ecosystems that offer significant carbon mitigation potential, Napa's cities and County will reduce total GHG emissions and protect valuable natural resources. Major contributors to GHG emissions, such as vehicle traffic and energy use, can be reduced on a local level through the implementation of sustainable development policies.

Planting trees in communities can make a difference when it comes to protecting the climate and mitigating the impacts of climate change.[52] Planting trees strategically to shade east and west walls of residential buildings would reduce air conditioning energy use. Shade trees also dramatically reduce the heat island effect of urban areas, which refers to built up areas that are hotter than nearby rural areas.[53] Implementing living (or green) roofs and transitioning from dark surfaces to light surfaces help to keep urban area temperatures cool and can reduce the summer peak electric load.[54] If tree planting actions were applied statewide, it is estimated that the amount of total CO_2 reduction annually would be 3.6 percent, equivalent to retrofitting homes with energy-efficient electric appliances.[55]

There are many best practices throughout the country that provide guidance to Napa's cities and County. The City of Los Angeles developed a method for locating potential tree-planting sites in urban areas, for example. The efficacy and cost-effectiveness of various forest management activities requires the development of reliable, accepted carbon measuring and

[51] Napa County Baseline Data Report, Chapter 10, Agricultural Resources.
[52] US Forest Service, Climate Change Resource Center, Urban Forests and Climate Change, August 2009.
[53] US Environmental Protection Agency. Heat Island Effect. September 2009. Available online at: www.epa.gov.
[54] Columbia University Center for Climate Systems research and Nasa/Goddard Institute for Space Studies. *Mitigating New York City's Heat Island with Urban Forestry, Living Roofs, and Light Surfaces: New York City Regional Heat Island Initiative*. The New York State Energy Research and Development Authority, June 2006.
[55] US Forest Service, Climate Change Resource Center, Urban Forests and Climate Change, August 2009.

monitoring protocols.[56] The US Forest Service Urban Forest Project Reporting Protocol provides detailed guidance to insure that tree planting projects meet eligibility requirements, produce GHG reductions that are additional to a baseline, are sustained for at least 100 years, and do not detract from management of existing trees.

Similarly, the Board of Forestry (BOF) has been involved in the development of forest protocols. The California Air Resources Board's (CARB) Scoping Plan states that the forest sector must achieve a "no net loss" target, which means it must achieve reductions in CO_2 equivalent to the current statewide forest carbon budget. Although regulatory protocols are still under development, such a policy suggests that if forestland is converted to vineyards, any loss in CO_2 sequestration capacity would need to be mitigated. BOF has developed strategies to reach this target and plans to use a combination of regulatory, statutory and incentive-based approaches to meet these goals.[57]

Objective AN3: Protect and increase the amount of vegetation and biomass in soil and reduce emissions from agricultural sources.

Actions described below will protect and increase the amount of biomass in soil and reduce emissions by:

- Promoting sustainable business
- Assessing impacts on carbon sequestration
- Protecting habitat

Promoting sustainable business

ACTION AN3.1: Support and promote the Napa Green Certified Winery Program and the Napa Green Certified Land Program ("Fish Friendly Farming"), as well as other practices.

Assessing impacts on Carbon Sequestration

ACTION AN3.2: Assess the positive or negative impacts of land use changes, new vineyards, and urban development on carbon sequestration.

Protecting habitat

ACTION AN3.3: Adopt policies, ordinances, and plans that create and enhance urban forests and greenways.

ACTION AN3.4: Adopt policies and ordinances to protect habitat and mitigate the conversion of oak woodlands and other important plant communities by permanently protecting similar habitats.

[56] California Energy Commission. *Methods for Measuring and Monitoring Forestry Carbon Projects in California.* 500-04-072F. April 2004.
[57] Board of Forestry, Climate Change Board. Available online at: www.fire.ca.gov.

Financing

The US Forest Service may have the capacity to collaborate with the County and cities of Napa to implement habitat protection and urban forestry programs. Additionally, funds provided by the Bay Area Air Quality Management District, which are provided periodically, may be applicable to urban forestry and habitat restoration projects.

Emissions Reduction Summary

Given the complexity of current and projected GHG emission calculations and associated funding, proposed actions to reduce GHG emissions sourced by agricultural, natural resources and forest have not been quantifiably assessed to determine potential implementers, feasibility, potential tons of GHG reduced, co-benefits, and estimated investment of each action.