PRELIMINARY BIOMASS FUEL AVAILABILITY AND FEASIBILITY REVIEW FOR SITING BIOMASS POWER FACILITIES IN MENDOCINO COUNTY, CALIFORNIA

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INTRODUCTION

TSS Consultants (TSS) was retained by the North Coast Resource Conservation and Development Council (RC&D) to complete a preliminary biomass fuel availability and feasibility review for the potential siting of new commercial scale biomass-fired power generation facilities within Mendocino County. Primary objectives for implementation of this study included:

- Create a market-driven solution to support forest fuels reduction and forest restoration/remediation activities in Mendocino County.
- Improve air quality by finding alternative uses for woody biomass material that would normally be burned in the open, thus impacting air quality and contributing to regional haze.
- Reduce the amount of woody material now being deposited in local landfills, thus extending the service life of the landfills.
- Support renewable energy development, thus diversifying local power generation and providing opportunities to efficiently utilize waste material (wood waste) for co-generation of both power and heat.
- Provide employment opportunities in the form of sustainable living wage jobs.

BACKGROUND

Throughout much of the inland West, concentrations of hazardous forest fuels are placing rural communities, sensitive habitat and entire watersheds at significant risk to catastrophic wildfire. During the 2000 fire season, over 8.4 million acres of wildlands in the West were impacted by fire. Total fire suppression costs during this record-setting fire season exceeded 1 billion dollars. Year-to-date in 2006 – destined to be another record setting year - over 8.8 million acres have been impacted by wildfire with fire suppression costs exceeding 1.2 billion dollars.

A primary factor influencing the intensity of these wildfire events is the unnaturally high concentrations of vegetation. This is noted in the April 1999 General Accounting Office report, Western Forests: A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats.

"The most extensive and serious problem related to the health of national forests in the interior West is the over-accumulation of vegetation."[1]

Clearly, over a century of successful fire suppression efforts have facilitated a very serious buildup of vegetation - mostly small, traditionally sub-merchantable trees. In order to restore the health of western forests and reduce the risk of wildfire, these over-stocked stands require treatment. Treatment typically includes the removal of small trees, both commercial, as sawlogs, and non-commercial, many times in the form of woody biomass fiber suitable for use as feedstock for power generation or other value-added options (compost, residential fuel pellets, or firewood).

The National Fire Plan (NFP), as implemented by the USDA Forest Service and the Bureau of Land Management, seeks to treat millions of acres of overstocked forests in the West. Complementary to this effort, there exists a significant opportunity for utilization of these small trees in the form of sawlogs for conversion to forest products (lumber/veneer/panel products) and woody biomass for use as fuel in the generation of heat and power.

In addition to reducing the costs and losses from wildfires, there are a number of public and private benefits from reducing forest fuels and diverting the biomass for use as fuel in the generation of renewable electrical power. These additional benefits include new jobs and businesses in rural communities, new property income and sales tax revenues for local and state agencies to provide more public services, and potential air quality improvements from significantly reducing air pollutants from wildfires or the open burning of woody biomass. Studies indicate that approximately 4.9 new jobs[2] are generated for every newly-developed megawatt of biomass power.

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[1]Page 3, GAO Report (GAO/RCED-99-65) - April 2, 1999 Report: Western National Forests – A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats.

[2]Morris, Gregory. 1999. *The Value of the Benefits of U.S. Biomass Power*, NREL/SR-570-27541. National Renewable Energy Laboratory, Golden, CO.

STUDY OBJECTIVES

The objective of this review is to determine if there is enough raw material feedstock, community support and ready markets for the sale of renewable electrical power to site appropriately-scaled commercial biomass power generation facilities within Mendocino County. This report addresses the following tasks as part of a phase 1 preliminary review:

Task 1. Preliminary review and estimate of current biomass fuel volumes by fuel type potentially available for a biomass power project. Fuel types considered will include:

- Timber harvest/fuels treatment residuals
- Urban wood waste
- Forest products manufacturing residuals
- Agricultural byproducts

Task 2. Preliminary review of current costs to harvest, process and transport biomass by type (as listed in task 1).

Task 3. Preliminary alternative market and competition review of where and how much available biomass material is currently utilized.

Task 4. Preliminary review of current biomass power markets and potential opportunities to secure a long-term power sales agreement.

Task 5. Utilizing information generated in tasks 1 to 4, summarize initial findings in preparation for a public presentation tentatively scheduled for August 1, 2006. Present initial findings and assist the workshop participants in a discussion regarding potential siting opportunities for commercial and non-commercial scale biomass co-generation (combined heat and power) facilities. Input from RC&D members/stakeholders, including Mendocino County Resource Conservation District, and others will be solicited to help select candidate sites that have potential support from local communities.

Task 6. Utilizing information gathered in tasks 1 to 5, generate a draft report that summarizes findings and provides recommendations and next steps for the RC&D to consider.

Task 7. After receiving input from the RC&D, generate final report.

FINDINGS

Biomass Fuel Potentially Available

TSS Consultants reviewed the potential availability of woody biomass fuel material within Mendocino County and found between 91,500 and 191,800 bone dry tons (BDT)[3] of woody biomass fuel is potentially available on an annual basis within Mendocino County. This volume of biomass fuel is sufficient to support between 10 and 24 megawatts (MW)[4] of power generation.[5] Table 1 reports potential biomass fuel availability by fuel type within Mendocino County.

Table 1. Summary of Woody Biomass Fuel Potentially Available on an Annual Basis Within Mendocino County (Expressed as BDT)

FUEL TYPE	LOW ESTIMATE	HIGH ESTIMATE
Timber Harvest Residuals	26,000	51,000
Fuels Treatment - Public	0	10,400
Fuels Treatment - Private	500	2,600
Urban Wood	8,000	9,000
Forest Products Residuals	55,000	115,000
Agricultural Byproducts	2,000	3,800
TOTALS	**91,500**	**191,800**

Cost Estimates

Summarized in Table 2 are cost estimates related to the costs of harvesting, collection, processing and transport of woody biomass material sourced from within Mendocino County. For the purposes of this study, it was assumed that transport distance averages 30 miles one way (60 miles round trip). These cost estimates were generated as a result of interviews conducted with biomass fuel processing contractors, timber harvesting contractors and resource managers operating within Mendocino County and Northern California.

[3]One bone dry ton (BDT) is 2,000 pounds of biomass (usually in chip form) at zero percent moisture.
[4]Assumes a consumption rate of 8,000 BDT/year per MW.
[5]One megawatt (MW) is a measure of electrical output and equals 1,000 kilowatts. This is enough generation to support approximately 1,000 households.

Table 2. Collection/Processing/Transport Costs and Market Values for Woody Biomass Fuel Sourced from Mendocino County (Expressed as $/BDT)

FUEL TYPE	LOW ESTIMATE	HIGH ESTIMATE
Timber Harvest Residuals	$42	$60
Fuels Treatment - Public	$50	$54
Fuels Treatment - Private	$28	$54
Urban Wood	$15	$24
Forest Products Residuals (market value)	$12	$30
Agricultural Byproducts	$24	$29

Current Biomass Utilization Markets

A variety of current value-added markets for woody biomass material exists in Mendocino County. Alternative-use markets for woody biomass material generated in Mendocino County are summarized in Table 3.

Table 3. Current Markets for Woody Biomass Material Generated Within Mendocino County

VALUE-ADDED MARKETS (LISTED IN DESCENDING ORDER BY VALUE - HIGHER VALUE TO LOWER VALUE)	RAW MATERIAL FEEDSTOCK
Compost and soil amendment	Yard trimmings, green waste, land clearing material, log yard waste
Landscape cover	Urban wood waste, bark, mill ends
Animal bedding	Shavings, sawdust
Pulp and paper	Residual chips, sawdust, green logs
Composite panels	Shavings, sawmill residuals
Firewood	Cull logs, tops, limbs
Biomass fuel	Urban wood, land clearing material, cull logs, tops, limbs, log yard waste, green waste

Renewable Power Markets - California

The California markets for renewable electrical power are significant and will continue to evolve, consistent with the state's Renewable Portfolio Standard and the Governor's Bioenergy Executive Order. Multiple entities are now or soon will be issuing Request for Proposals (RFP) and Request for Offers (RFO) seeking to procure renewable electrical power long term. Entities that have or will soon be issuing RFP's and RFO's include:

- Pacific Gas and Electric Company
- Sacramento Municipal Utility District
- Northern California Power Agency

MENDOCINO COUNTY STUDY AREA

For the purpose of this review, Mendocino County is considered to be that geographic region included as the study area. Exhibit 1A below provides an overview of Mendocino County.

Exhibit 1A. Mendocino County Study Area

Vegetation Cover Types – Mendocino County Study Area

To better assess woody biomass material available for a given area, it is helpful to understand the vegetation types within the study area. Woody biomass material available on a sustained basis over time for a given area is directly dependent upon vegetation type. Vegetative cover and landownership data for this study was sourced from the following:

- California Spatial Information Library (CaSIL)
- California Vegetation (CAL VEG) Data Layer - California Department of Forestry and Fire Protection (1980)
- Geographic Analysis Program (GAP) regional analysis – California GAP Analysis, Santa Barbara (1998)

Vegetation cover classes utilized in this analysis are consistent with the California Wildlife Habitat Relationship database.

Exhibit 1B highlights vegetation cover within Mendocino County.

Exhibit 1B. Vegetation Cover Map – Mendocino County

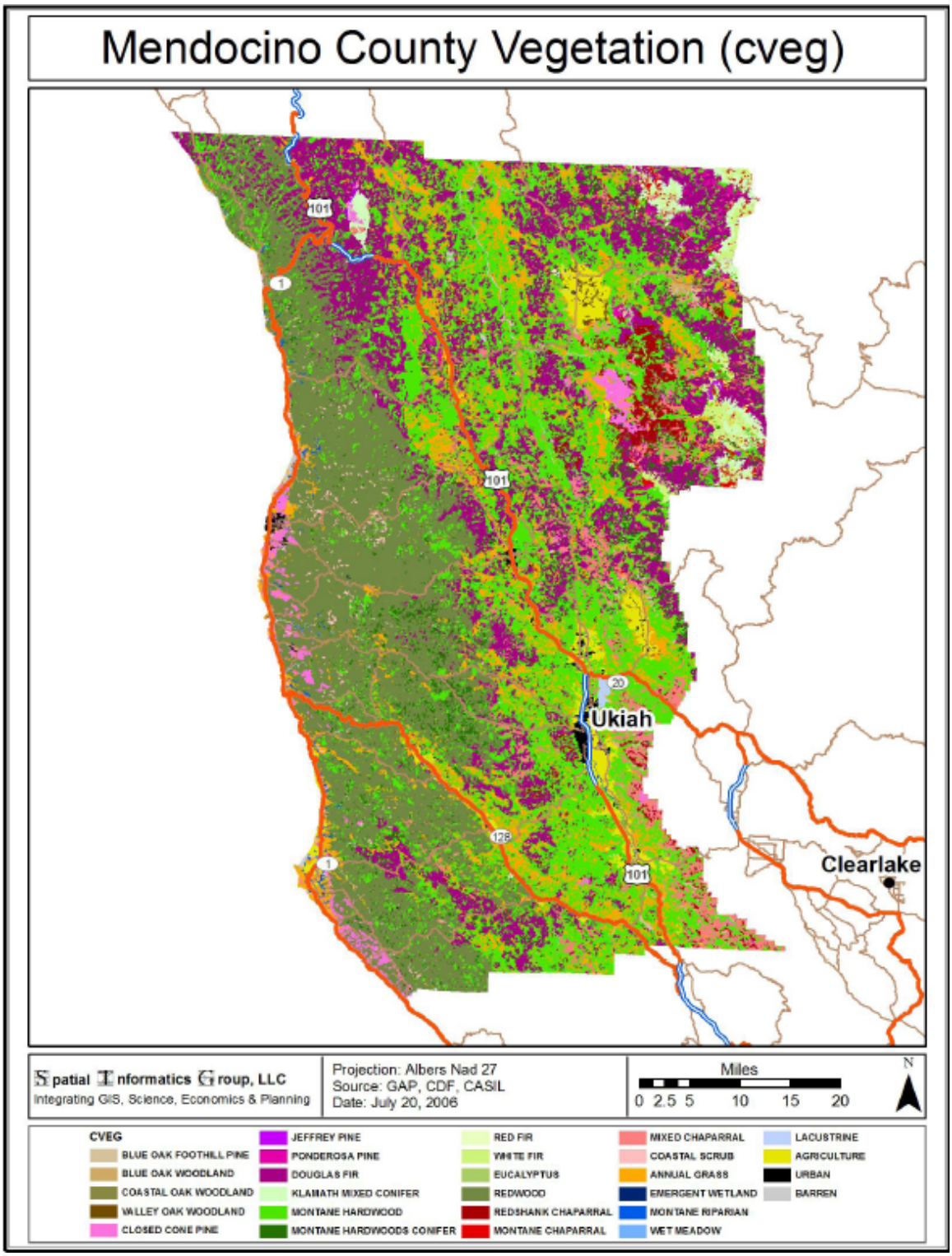


Table 4 provides the key findings of the vegetation cover analysis by ownership class in tabular form.

Table 4. Vegetation Cover Type by Ownership – Mendocino County

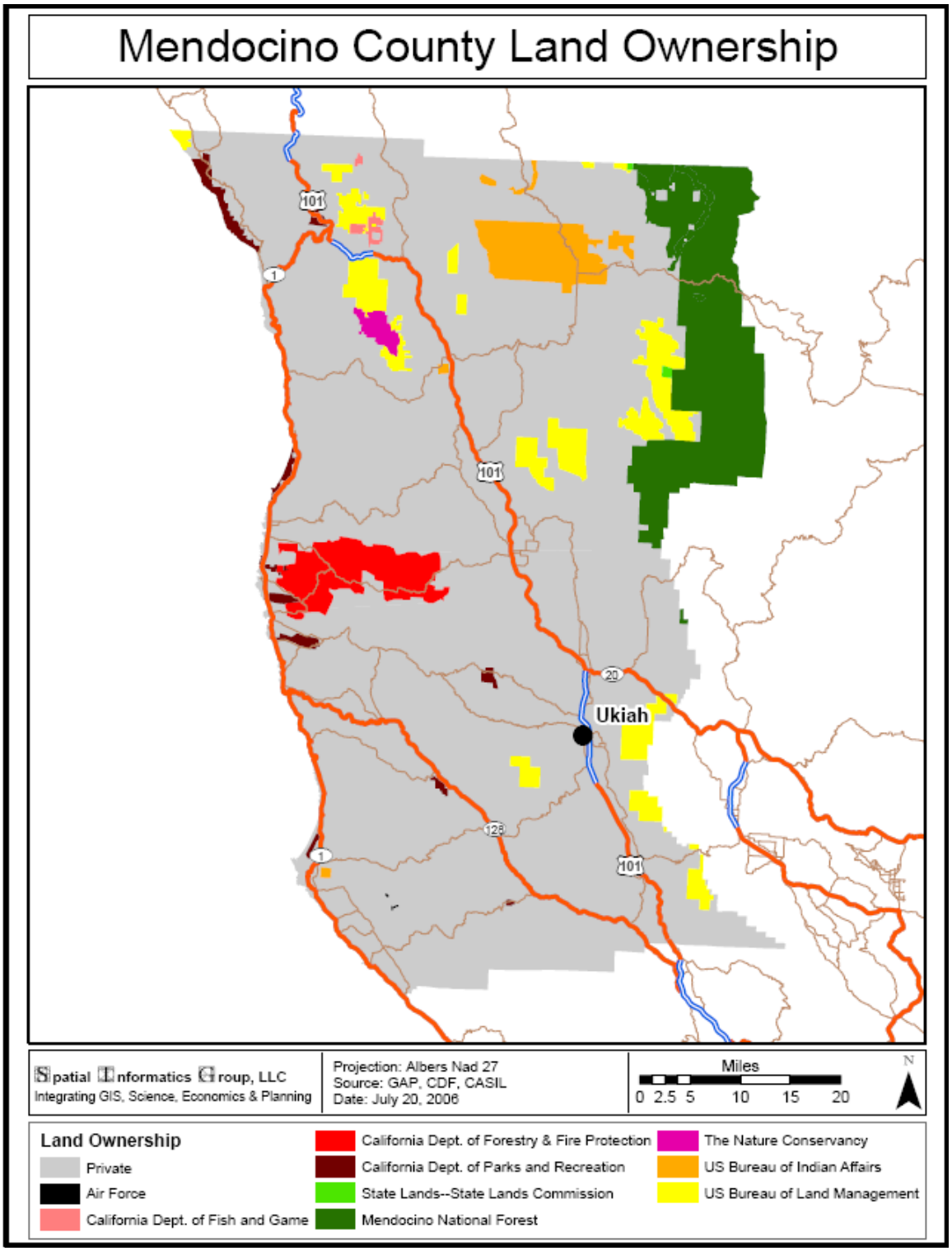
VEGETATION COVER TYPE	FOREST OWNERSHIP					TOTAL	TOTAL
	PRIVATE	USFS[6]	BIA[7]	BLM[8]	OTHER PUBLIC[9]		(% TOTAL FORESTED ACRES)
Oak-Woodland	22,194	2,574	1,059	1,724		27,549	**3%**
Ponderosa Pine	6,343	5,496	314	210	6	12,369	**1%**
Red Fir		51				51	
White Fir	492	17,071		63	9	17,636	**2%**
Doug Fir	288,794	63,400	12,275	26,246	2,942	393,658	**38%**
Jeffrey Pine	221	900	14	295	8	1,439	
Klamath Mixed Conifer	1,857	21,858	232	2,629	574	27,151	**3%**
Redwood	500,959		69	521	58,260	559,810	**54%**
Eucalyptus	62		4		2	68	
TOTAL ACRES	**820,922**	**111,350**	**13,966**	**31,689**	**61,802**	**1,039,730**	
TOTAL (%)	**79%**	**11%**	**1%**	**3%**	**6%**		

A complete listing of all vegetation classes (not just forest vegetation cover as shown in Table 4) by ownership category is provided in Appendix A.

[6]USFS – US Forest Service.
[7]BIA – Bureau of Indian Affairs.
[8]BLM – Bureau of Land Management.
[9]Other Public includes National Park Service, California State Parks, County/City lands.

Mendocino County land ownership is shown below in Exhibit 1C.

Exhibit 1C. Land Ownership Map – Mendocino County



Observations from vegetation cover and forest land ownership patterns in Mendocino County include:

- Approximately 46% of Mendocino County is forested – 1,039,730 of the 2,243,171 total acres.
- Over 79% of Mendocino County forest land is held in private ownership.
- Major forest vegetation types that make up about 92% of the forest type in Mendocino County include:
    - Redwood – 54% (559,810 acres)
    - Douglas fir – 38% (393,658 acres)

A region represented by Mendocino County with forest vegetation cover on over 46% of the landscape will typically produce significant quantities of forest residuals that can be utilized as value-added products. These forest residuals are generated during land management activities including:

- Timber harvest operations.
- Hazardous fuel reduction treatments.
- Land-clearing activities.
- Forest remediation/restoration following a catastrophic event such as wildfire, insect activity or disease.

The following section of this review provides an analysis of forest residuals (and other woody biomass) that may be available as a result of land management activities.

BIOMASS FUEL AVAILABILITY

From May through July 2006, TSS conducted a woody biomass fuel availability review of Mendocino County. The primary objective of the study was to determine the volume of woody biomass fuel resources that are potentially available (environmentally sustainable and economical) as biomass fuel for a power generation facility located within the county. As noted earlier in this report (Exhibit 1A), the study area includes that geographic region included within Mendocino County.

Timber Harvest Residuals

As noted previously in this review, timber harvest residuals can provide a significant volume of woody biomass material. Typically available as limbs, tops and un-merchantable logs, these residuals are generated as by-products of timber harvesting activities and as such can be a relatively economical raw material. Once collected and processed using portable grinders, this material is an excellent biomass fuel source.

Woody biomass fuel assessment studies traditionally rely on information regarding historic timber harvest levels. This information can provide insight to determine trends and historical benchmarks to show actual forest harvest activities over time.

Table 5 provides a historic perspective summarizing forest harvest activities from 2001 through 2005 within Mendocino County. Annual timber harvests[10] during this five-year study period ranged from a high of 120,841 thousand board feet (MBF[11]) in 2005 to a low of 97,722 MBF in 2002.

Table 5. 2001 – 2005 Historic Timber Harvest Levels - Mendocino County

YEAR	VOLUME (MBF)	POTENTIAL BIOMASS FUEL[12]
2005	120,841	54,378
2004	109,548	49,296
2003	122,568	55,156
2002	97,722	43,975
2001	117,596	52,918
TOTALS	568,275	255,723
5 year average	**113,655**	**51,145**

The notable decrease in the 2002 timber harvest level can be directly attributed to two factors, one of which is market driven while the other is guided by changes in public land management policy:

- Relatively depressed North American markets for lumber.
- Decreased harvesting activity on publicly-managed lands.

The decrease in harvesting activities on public lands is related to a drop in harvest activities on forest lands managed by the USDA Forest Service and the California Department of Forestry and Fire Protection (CDF). This decrease in harvest level activity is a direct result of public land management agencies shifting land management focus away from commodity production (sawlog outputs) to concentrate more on amenity values (watersheds, wildlife habitat, fisheries habitat and recreation to name a few). The CDF has suspended timber harvest activities on the Jackson State Demonstration Forest until a forest management plan is finalized.

Timber harvests in 2004 and 2005 were only conducted on private lands within Mendocino County. This trend will more than likely continue with very limited, if any timber harvests expected from publicly managed lands.

[10] This data is presented courtesy of the California State Board of Equalization (BOE).
[11] MBF represents 1,000 board foot measure. One board foot is a solid wood board measured 12 inches square by 1 inch thick.
[12] Assumes 50% of harvested lands will allow recovery of harvest residuals at 0.9 BDT/MBF.

Based upon TSS's experience working with logging and chipping contractors in this region, the recovery factor for biomass fuel processed from timber harvest residuals is approximately 0.9 BDT of woody biomass (tops and limbs) and could be generated from each MBF of timber harvested. Table 5 summarizes potential biomass fuel available from timber harvest residuals using the 0.9 BDT/MBF biomass fuel recovery factor. Not all timber harvest operations lend themselves to ready recovery of harvest residuals. Steep slopes, remote locations and road systems that will not accommodate chip trucks (for transport of biomass fuel) will limit the volume of biomass fuel recovered from timber harvest activities. For this reason biomass fuel recovery numbers in Table 5 assume that approximately 50% of harvest operations are conducted on land that will accommodate recovery of biomass fuel. Using the last five years (2001 – 2005) average harvest level as a benchmark, approximately 51,000 BDT per year of biomass fuel is potentially available from timber harvest activities within Mendocino County.

Fuels Treatment Activities – Public Lands

As discussed in the Introduction section of this review, the National Fire Plan was launched after the devastating fire season of 2000 when more than 8.4 million acres were impacted by wildfire. The nation began to realize the problem posed by years of fuel accumulating to unnaturally high levels primarily in the inland West region. The National Fire Plan is the foundation for a long-term program to reduce fire risks and restore healthy, fire-adapted ecosystems, primarily on public lands.

Since 2000, other efforts and initiatives have supplemented the general direction of the National Fire Plan. Examples include:

- The Ten-Year Comprehensive Strategy and Implementation Plan, a collaborative product of the Western Governors' Association, federal agencies, Tribes, interest groups, and local officials, calls for more active forest and rangeland management. The Plan outlines ways to protect communities and improve the environment through restoration projects.
- The Healthy Forests Restoration Act (HFRA) of 2003 provides BLM and USFS land managers with legislative tools to expedite forest and rangeland restoration projects. HFRA aims to expedite the preparation and implementation of hazardous fuels reduction projects on federal land and assist rural communities, states, and private landowners in restoring healthy forest conditions on state and private lands.
- The Tribal Forest Protection Act (TFPA) of 2004 authorizes the Secretary of Agriculture and the Secretary of the Interior to give special consideration to tribally-proposed projects on Forest Service or BLM land bordering or adjacent to Indian trust land. The projects initiated under this Act are primarily to protect the Indian trust resources from fire, disease, or other threats that may start on Forest Service or BLM lands.

Timber and fire staff managing public lands typically accomplish fuels treatment using a variety of treatment options/tools including:

- Treat and leave on site.
- Treat and remove.
- Prescribed fire to combust unwanted vegetation on site (pile and burn or broadcast burn).

In recent years pubic lands managers have begun to re-think the use of prescribed fire as the primary fuels management tool of choice. Public stakeholders have voiced concerns regarding the predominant use of prescribed fire due to the following issues:

- Air quality impacts (haze, human health issues associated with air quality).
- Potential for escape (concerns for a repeat of the Cerro Grande fire in New Mexico or Lewiston Fire in California).
- Visual impacts of burned and blackened forests.
- Biomass utilization for value-added products and rural employment.

With the National Fire Plan policy implementation, fuels treatment goals set and public stakeholders input, the public lands timber and fire staff have begun utilizing the treat and remove fuels treatment method. In addition, and as a result of the Healthy Forest Restoration Act, public forest managers have new contracting tools such as stewardship contracts that can facilitate the treatment of thousands of acres over a maximum contractual term of 10 years.

Timber and fire staff managing public lands monitor forest fuels treatments as acres treated. Funding for these treatments are appropriated by Congress on an annual basis and may be inconsistent over time. Discussions with national forest staff also yielded information on two primary risks associated with project development and implementation on public forests.

- Funding from Congress for fuels treatment is allocated on an annual basis. Variations in funding levels can severely impact the number of acres treated in any given year.
    - Much of the funding allocated to forest fuels treatment projects is used in the compilation of environmental assessments and studies as required by the National Environmental Policy Act (NEPA).
    - Staffing levels for timber and fuels management personnel are dependent upon funding availability. If staff is reduced as a result of decreased funding, then the number of fuels treatment projects planned and implemented will likely be reduced.
- Litigation and/or appeals from conservation organizations. Some forests are clearly more targeted than others.

Interviews with federal land managers on the Mendocino National Forest[13] and the Bureau of Land Management – Arcata Field Office[14] indicate that approximately 800 to 1,000 acres of fuels treatment are planned annually on federally-managed lands within Mendocino County.

The volume of biomass fuel generated as a result of fuels treatment activities can vary significantly depending on the existing forest conditions and the management objectives of the landowner/agency. Interviews with Northern California chipping contractors, private forest managers and national forest staff indicate that biomass fuel removed from fuels treatment activities on national forests can range from 3 to 20 BDT per acre.

Using an average removal/recovery factor of 13 BDT/acre and the assumption that approximately 800 acres of BLM and USFS managed lands receive fuels treatments annually, about 10,400 BDT/year of biomass fuel is potentially available.

Fuels Treatment Activities – Private Lands

There are no known records available that summarize the number of acres treated or biomass material removed from privately-managed forests within Mendocino County. However, from interviews with private land forest managers,[15] it is clear that there is a strong interest to conduct forest fuels treatment activities.

Like public forest managers, private forest managers must prepare environmental documents prior to startup of harvesting or fuels treatment operations. Documents known as timber harvest plans (THP) must be prepared consistent with regulatory guidelines outlined in the California Forest Practices Act and the California Environmental Quality Act (CEQA). In recent years California's legislature and the State Board of Forestry have relaxed documentation and regulatory requirements associated with forest fuels treatment activities. These changes were made in an effort to reduce regulatory expense for private forest landowners attempting to conduct fuels reduction projects. However, private forest managers are facing some challenges in the implementation of fuels treatment projects, including:

- Lack of chipping contractors available to conduct fuels treatment projects. Several of the local contractors have gone out of business or downsized. Some contractors have trended away from conducting work on private lands, opting to concentrate efforts on the implementation of fuels treatment service contracts as offered by the USFS and the BLM.
- Lack of hauling contractors available to transport biomass fuel to market.
- Increased diesel fuel costs that have not been recouped by the value of biomass fuel delivered to the biomass plants.

[13]John Teutrine, Fuels Specialist, Upper Lake and Covello Ranger Districts.
[14]Hank Harrison, Forester, Arcata Field Office.
[15]Tom Schultz, Mendocino Redwood Company and Craig Blencoe, Consulting Forester.

- Uncertainty regarding future biomass fuel values.

Due primarily to the issues listed above, very few acres of private forest lands within Mendocino County receive fuels treatment now or are expected to receive treatment in the near term. Experience in other forested regions of California where mature biomass fuel markets exist, indicates that if biomass power plants are able to purchase biomass fuels at rates that offset some of the treatment and transport costs, private forest landowners will be motivated to treat and remove forest fuels. However, for this review, TSS assumes that no biomass material will be available in the near future from fuels treatments on private lands in Mendocino County.

Private forest landowners aside, some fuels treatment on private lands within Mendocino County is currently being accomplished due to efforts organized and funded as a result of initiatives led by the Mendocino County Fire Safe Council (MCFSC). Founded in 2003, this organization is quite active and is primarily focused on the treatment of hazardous fuels within the Wildland Urban Interface (WUI) to protect communities within the county. Interviews with the MCFSC staff[16] indicate that some minimum level of fuels treatment will occur annually as a requirement of state policy. For example, beginning January 1, 2005, new state regulations require private landowners to provide 100 foot clearance for fire defensible space near buildings. This new policy, regulated by the CDF, is a result of California Senate Bill 1369 (SB 1369) as signed by Governor Schwarzenegger in 2004. Appendix B provides detailed information regarding this bill.

In addition to fuels treatments as a result of SB 1369, the MCFSC coordinates fuels treatments (when funded) consistent with the Mendocino County Community Wildfire Protection Plan (CWPP). The CWPP represents a comprehensive fuels treatment and community education plan developed by the following organizations:

- Mendocino County Fire Services
- Mendocino County
- California Department of Forestry and Fire Protection
- Mendocino Fire Safe Council

Homeowner compliance with SB 1369 and MCFSC-sponsored projects will generate some volume of biomass material that can be readily processed for use as fuel. TSS's experience with fuels treatment activities indicates that between 5 and 15 BDT/acre of woody biomass is generated as a result of fuels treatment activities conducted within the WUI. If 260 acres are treated annually, and approximately 10 BDT/acre is treated and removed, 2,600 BDT of biomass fuel is potentially available from fuels treatments within the WUI in Mendocino County.

[16] Julie Rogers, Coordinator, Mendocino County Fire Safe Council.

Urban Wood Waste

Mendocino County communities such as Fort Bragg, Willits, and Ukiah are witnessing an increase in the amount of wood waste currently sorted and recovered instead of being burned in the open or deposited in landfills. Interviews with the Mendocino Solid Waste Management Authority staff[17] indicated that there are 10 transfer stations within the County with 6 actively segregating wood waste (known as urban wood to differentiate it from forest-sourced wood waste) from the waste stream. Primary motivation for these wood waste recovery efforts include:

- Extend the functional life of landfills through diversion of material to alternative uses. Tip fees at the landfills are on the rise to provide an incentive for increased recycling/alternative utilization efforts.
- New residential and commercial developments continue to proliferate due to relatively low mortgage rates and an active economy, thus more land clearing is taking place. This creates more wood waste in the form of vegetative material (brush, small trees, etc.).
- Air quality concerns have placed increased restrictions upon the open burning of wood waste.
- Alternative uses for wood waste have created opportunities for recyclers to merchandize wood waste material into value-added products including:
    - Landscape cover
    - Furnish for composite panel (particle board/hardboard) production
    - Alternative daily cover at landfills
    - Firewood
    - Animal bedding
    - Fuel for power generation

[17]Mike Sweeney, General Manager, Mendocino Solid Waste Authority.

Table 6 provides an overview of the Mendocino Transfer Stations currently sorting and recovering wood waste. The Mendocino Solid Waste Authority provided 2005 data for this table.

Table 6. 2005 Urban Wood Recovery Results – Mendocino County

(Expressed as Green Tons)

OPERATION	YARD WASTE	WOOD WASTE	GREEN WASTE	TOTALS
Caspar Transfer Station			390	390
Ukiah Transfer Station			4,139	4,139
Willits Transfer Station	234	259		493
Empire Waste Management			2,133	2,133
Solid Wastes of Willits	472	417		889
Fort Bragg Disposal	240			240
TOTALS	**946**	**676**	**6,662**	**8,284**

A formal survey of the urban waste stream characteristics or wood waste recycling firms located in Mendocino County communities is beyond the scope of this assessment. However, TSS has conducted comprehensive waste stream studies that quantified and characterized wood waste generated in urban communities. One such study that surveyed the St. Paul/Minneapolis metropolitan area from 1994 to 1998 yielded results indicating that approximately 0.1 BDT of wood waste capable of processing into biomass fuel is generated per capita annually. Using this information and the latest (2005) census data, potential quantities of urban wood waste can be estimated. Using the 2005 Mendocino County population figure,[18] TSS estimates that approximately 9,000 BDT of urban wood material is potentially available per year from sources within Mendocino County.

[18] As provided by the US Census Bureau.

Forest Products Manufacturing Residuals

Currently there are five separate companies operating commercial-scale sawmills within Mendocino County, all of which are listed below.

Table 7. Commercial-Scale Sawmills Operating Within Mendocino County

SAWMILL	LOCATION
Mendocino Forest Products	Ukiah
Redwood Empire	Philo
Harwood	Branscomb
Willits Redwood	Willits
Agwood	Ukiah

All of the sawmill/veneer operations listed above are producing residuals in one form or another including bark, sawdust, shavings (green and dry), chips and log yard waste (log chunks, bark). Interviews were conducted with representatives from all five sawmills. All of these facilities are net producers of residuals, over and above their own internal use as biomass fuel for lumber drying. All residuals not utilized on site at these facilities are merchandized and sold to established markets off site. (See alternative markets section of this review for more information on current markets for wood waste in Mendocino County.) Table 8 provides a summary of the residuals, by type of wood waste generated, for all five sawmills and the relative market value of these residuals.

Table 8. Forest Products Manufacturing Facility Residuals
Volume Produced Annually – Mendocino County
(Expressed as BDT)

SHAVINGS	BARK	CHIPS	SAWDUST
20,278	36,225	60,811	55,247
Most Valued			**Least Valued**

Log yard waste (processed and unprocessed) could be available as biomass fuel at a relatively economical rate. However, this material typically contains a somewhat high percentage (5 to10% by weight) of non-combustibles (dirt and rock) and is not considered a premium biomass fuel. Most sawmill/veneer plants do not have log yard waste processing equipment (water bath separation and screens) on site. For the purposes of this biomass availability review, log yard waste was not considered a viable fuel source.

Shavings are typically merchandised for value-added products such as animal bedding and as furnish for composite panels. Bark is valued for use as landscape cover. These value-added markets are mature, consistent and relatively stable. Shavings and bark residuals are valued at rates substantially higher than chips and sawdust. For this review, TSS assumes that only chips and sawdust will be economically available for potential use

as biomass fuel within Mendocino County. Assuming that all five sawmills continue operating at current levels, approximately 115,000 BDT of forest residuals are potentially available as biomass fuel annually within Mendocino County.

Agricultural Byproducts

In some regions of the West, agricultural byproducts have the potential to provide a stable, long-term and cost effective biomass fuel source. Agricultural byproducts can be available in a variety of forms including:

- Shells (e.g., walnut shells, almond shells).
- Pits (e.g., olive pits, peach pits).
- Orchard Prunings – generated annually from orchard operations.
- Orchard Removals – As orchards mature over time, productivity and yield decline or become inconsistent. Orchards are removed and replaced with new orchard stock or alternative uses, such as commercial or residential development.

The 2004 Mendocino County Crop Report[19] as generated by the Mendocino County Agricultural Commissioner[20] notes that over 2,500 acres of commercial orchards are currently in production within the County. Orchards now in cultivation include apple, pear, and walnut.

The primary agricultural byproducts that could be utilized as a biomass fuel source within the study area are orchard prunings and removals. Currently, prunings are being piled and burned or chipped and scattered on site.[21] Orchard owners are becoming more reluctant to pile and burn prunings due to air emissions issues. Alternative uses for prunings, such as biomass fuel, could be attractive to orchard owners as a way to mitigate air emissions from open burning of prunings (among other potential benefits).

Whereas no agricultural byproducts within the Mendocino County are currently being utilized for biomass fuel, orchard prunings and removals could be collected, processed, and transported for this purpose. In 2001 the Mendocino County Air Quality District sponsored a demonstration that facilitated the processing and transport of approximately 500 tons of orchard prunings and removal material. The Georgia Pacific facility at Fort Bragg received this biomass fuel and found it to be acceptable.[22]

In some regions of the West, such as central and northern California, orchard pruning recovery and utilization is commonplace. TSS's experience working with commercial orchard operations indicates that a recovery of 1 to 2 BDT per acre, per year from orchard pruning processing and 13 BDT per acre for orchard removal material, is a common rule of thumb.

[19] As secured by Travis Steele.
[20] David Bengston, Agricultural Commissioner, Mendocino County.
[21] Per discussions with Chris Brown, Senior Air Quality Specialist, Mendocino County Air Quality District.
[22] Discussion with Jere Melo, forester, formerly with Georgia Pacific – Fort Bragg.

In order to estimate the amount of biomass fuel potentially available from orchard pruning processing activities on commercial orchards within Mendocino County, the following assumptions can be made.

- Biomass fuel from orchard pruning recovery operations are potentially available at a rate of 1 BDT per acre, per year. Currently 2,520 acres of orchards are in production, with a potential recovery of 2,520 BDT per year of material for use as biomass fuel.
- Biomass fuel from orchard removal operations are potentially available on 4% of the 2,520 acres (100 acres) of commercial orchards per year. Approximately 100 acres of orchard removals will generate about 1,300 BDT per year of material for use as biomass fuel.

The 2004 Mendocino County Crop Report notes that over 15,600 acres of commercial wine grapes are now in cultivation. Commercial wine grape operations generate some amount of waste product as a result of vineyard removals, pruning and processing into wine. Unfortunately, vineyard waste is problematic as a fuel source for a number of reasons including wire trellising, metal grape stakes, presence of pressure-treated wooden grape stakes and high amounts of dirt mingled with the vines. The current practice of open field burning removals and pruning will probably continue for the foreseeable future. Grape pomace generated as a result of processing grapes into wine (also known as "the crush") is typically made up of 5% seeds and 15% skins and other residue. Once dried, grape pomace can be utilized as biomass fuel. Unfortunately, grape pomace is high in moisture and tends to have odor issues when stored in the open. For this reason, TSS has not included vineyard removals, prunings or grape pomace as available fuel in this review.

Primary agricultural residuals potentially available in Mendocino County are the orchard removals and prunings. Table 9 summarizes annual removals and prunings based upon assumptions listed earlier and orchard cultivation figures as provided in the 2004 Crop Report.

Table 9. 2004 Fruit and Nut Orchard Cultivation and Biomass Fuel Projection – Mendocino County

ORCHARD TYPE	ACRES CULTIVATED	PRUNINGS BIOMASS GENERATED (BDT)	REMOVALS BIOMASS GENERATED (BDT)
Apples	281	281	150
Walnuts	50	50	20
Pears	2,189	2,189	1,130
TOTALS	**2,520**	**2,520**	**1,300**

Cost of Biomass Fuel – Collection, Processing and Transport

To better understand the cost of biomass fuel delivered to a power generation facility, the full costs of collection, processing and transport must be assessed. Due to the fact that California has a mature biomass power generation market sector, these costs are well understood.

Interviews were conducted with forest fuels treatment operation managers, foresters, wood waste processors and orchard material processors regarding the costs of collection, processing and transport of biomass fuels. The findings are presented in a low and high range due to the number of variables that can impact costs of operation including:

- Haul distance to facility.
- Vegetation type and density.
- Cost of diesel.
- Cost of labor.
- Road improvement and maintenance.
- Time of year delivery.

Outlined below in Table 10 is the range of costs. Note that forest product residuals have little or no collection and processing costs. These cost estimates assume an average haul distance of 30 miles to transport the biomass fuel to a biomass power generation facility.

Table 10. Collection, Processing and Transport Costs and Market Values by Fuel Type – Mendocino County

FUEL TYPE	LOW ESTIMATE	HIGH ESTIMATE
Timber Harvest Residuals	$42	$60
Fuels Treatment - Public	$50	$54
Fuels Treatment - Private	$28	$54
Urban Wood	$15	$24
Forest Products Residuals (market value)	$12	$30
Agricultural Byproducts	$24	$29

Alternative Market Review

The primary focus of this study is to conduct a preliminary review of woody biomass material potentially available for use as biomass fuel. However, in order to understand what volume of material may be available over time for use as fuel, a review of alternative markets for this material is in order. Table 11 provides an overview of alternative value-added markets for woody material currently generated within

Mendocino County. Note that the alternative markets are listed in descended order with the higher-value markets listed first.

Table 11. Alternative Markets by Value and Raw Material – Mendocino County

VALUE ADDED MARKETS (LISTED IN DESCENDING ORDER BY VALUE - HIGHER VALUE TO LOWER VALUE)	RAW MATERIAL FEEDSTOCK
Compost and soil amendment	Yard trimmings, green waste, land clearing material, log yard waste
Landscape cover	Urban wood waste, bark, mill ends
Animal bedding	Shavings, sawdust
Pulp and paper	Residual chips, sawdust, green logs
Composite panels	Shavings, sawmill residuals
Firewood	Cull logs, tops, limbs
Biomass fuel	Urban wood, land clearing material, cull logs, tops, limbs, log yard waste, green waste

Note that there are numerous higher value options for woody biomass material and that biomass fuel should not be considered necessarily as the highest and best use.

Biomass Power Sales Market Review

A key component of a biomass power generation preliminary review includes a study of power sales marketing opportunities. This includes identifying potential markets for the long-term sale of base-load renewable power from a biomass power project located within Mendocino County.

Most of Mendocino County is located within Pacific Gas and Electric Company (PG&E) service territory. Since a new biomass power plant would be built within or close to PG&E's service territory, there are major advantages with the sale of power generation to PG&E, primarily associated with reduced costs to connect with the PG&E transmission/distribution system and the ability for PG&E to distribute the power generation locally. Because of these and other logistic advantages, PG&E is a logical customer for base-load generation from a biomass power project in Mendocino County.

As an Investor Owned Utility (IOU), PG&E is regulated under the California Public Utilities Commission and is required to meet certain legislated mandates including the California Renewable Portfolio Standard (RPS). California's RPS was enacted in September of 2002 with the passage of California Senate Bill 1078. The RPS currently requires IOU's to purchase not less than 20% of electricity sold to California retail customers from renewable energy resources by 2010 and 33% by 2020. Qualifying renewable resources as defined by the RPS include:

- Solar (thermal and photovoltaic)
- Wind
- Geothermal
- Fuel cells utilizing renewable fuels
- Small hydropower (less than 30 MW)
- Digester gas
- Landfill gas
- Ocean wave
- Biomass

Under the RPS, IOU's are required to increase their procurement of eligible renewable energy by at least 2% per year so that 20% of their retail sales are procured from renewable resources by 2010 and 33% by 2020.

In addition to the RPS, Governor Schwarzenegger signed an Executive Order on April 25, 2006, in support of a Bioenergy Action Plan that sets targets for biomass power generation to make up 20% of renewable power generation in 2010 and 2020. Currently, biomass power capacity in California amounts to approximately 550 MW generated at 28 commercial-scale biomass power facilities. The Governor's Executive Order supports an additional 350 MW of biomass power by 2010 and another 1,100 MW biomass power by 2020 (see Appendix C for the complete text of the Governor's Bioenergy Executive Order). The California Energy Commission is currently analyzing policy options to implement this Executive Order.

IOU's such as PG&E typically issue RFP's or RFO's announcing their interest to entertain proposals from qualified independent power producers to sell renewable energy generation to PG&E to help it meet the state-mandated RPS. PG&E has already issued a renewable energy RFO for 2006 (see Appendix D for the current PG&E RFO Bidders Registration Form).

It is expected that PG&E and the other California IOU's will issue RFP's or RFO's annually requesting proposals for additional renewable power to meet the RPS mandate. There are four California IOU's, as follows:

- Pacific Gas and Electric Company
- Pacific Power
- San Diego Gas and Electric
- Southern California Edison

While not held to the RPS requirements, some Municipal Electric Utilities have established internal targets for renewable energy development and purchases. One of the

largest Municipal Electric Utilities in the State, Sacramento Municipal Utility District (SMUD), has set targets for renewable energy that are very similar to the California RPS: 20% renewable energy by the year 2011. Like the California IOU's, SMUD has issued an RFO for renewable energy proposals. Attached as Appendix E is the draft power purchase agreement that SMUD expects to use as a contract template to formalize the long-term purchase of renewable power. Like PG&E, SMUD is expected to issue an RFO annually to secure renewable power generation to meet its targets.

In addition to RFO's issued by the investor-owned utilities and larger Municipal Electric Utilities like SMUD, other entities (such as the Northern California Power Agency) are expected to issue renewable energy RFO's in the near future..

The Northern California Power Agency (NCPA) was formed in 1968 and provides power generation purchase, aggregation, transmission, and scheduling of electric power for 13 members. Membership is open to municipalities (including City of Ukiah), rural electric cooperatives, irrigation districts and other publicly-owned entities. Primary responsibility of the NCPA is the purchase, aggregation, scheduling and management of electric energy for its members. NCPA staff[23] interviewed noted that the agency will be issuing a renewable energy RFO in late September, 2006, targeting the purchase of 80 MW of renewable electric power.

As noted earlier, the City of Ukiah is a member of the NCPA. Ukiah operates a publicly- owned utility known as Ukiah Public Utilities. Within Ukiah Public Utilities is the Electric Division which purchases power at wholesale rates for its retail customers. Discussions with Ukiah Public Utilities staff[24] indicate that the City of Ukiah is currently meeting its renewable energy goals through the purchase of geothermal and hydropower. In addition, this utility is currently in the process of restarting the Lake Mendocino hydroelectric facility. Given the current power purchase arrangements and new generation planned, it is highly unlikely that Ukiah Public Utilities will be interested in purchasing additional renewable energy in the short term.

The California markets for renewable electrical power are significant and will continue to evolve consistent with the State's RPS and the Governor's Bioenergy Executive Order. Multiple entities are now (or will soon be) issuing RFP's and RFO's seeking to procure renewable electrical power long term. These entities include:

- Pacific Gas and Electric Company
- Sacramento Municipal Utility District
- Northern California Power Agency

OBSERVATIONS/RECOMMENDATIONS

[23]Dana Griffith, Power Coordinator and Planning Engineer, Northern California Power Agency.
[24]Elizabeth Kirkley, Electric Distribution Engineer, Ukiah Public Utilities.

Additional Biomass Fuel Sources

As noted in the Findings section of this review, the potential availability of biomass fuel for use in the generation of renewable energy is significant. Between 91,500 and 191,800 BDT of biomass fuel is potentially available on an annual basis from sources within Mendocino County. If all of this biomass fuel were converted to electrical energy, between 10 and 24 MW of power could be generated on a sustainable basis.

In addition to biomass fuel generated within Mendocino County, there exists opportunities to access biomass fuel from surrounding counties. For example, much of the municipal solid waste generated in Mendocino County is being transported[25] out of county for disposal. These trucks could potentially be utilized to economically transport urban wood waste on the return trip. Known as a "back haul," these transport opportunities provide significant transport cost savings and can substantially increase the volume of available biomass fuel for a project located within Mendocino County.

Community Interest in Biomass Utilization

Interviews with Mendocino County residents, conducted as part of this review, indicated strong community support for establishment of economical, value-added markets in support of woody biomass utilization. Many of those interviewed expressed a concern that any such new or expanded markets should have the following attributes:

- **Environmentally benign** – no negative impacts to the environment (air, water, forest resources, wildlife/fisheries).
- **Provide societal benefits** – generate products that are environmentally sustainable and provide multiple benefits to society.
- **Employ local residents –** provide family wage jobs.

The sentiments as summarized above were also evident during the August 1, 2006, Mendocino County Biomass Utilization Workshop. This workshop, held in Ukiah, attracted approximately 50 participants and was sponsored by the following organizations:

- USDA Forest Service, Region 5
- University of California Cooperative Extension
- California Department of Forestry
- North Coast Resource Conservation & Development Council
- Mendocino County Resource Conservation District

This workshop was organized as a community outreach and education effort to introduce targeted Mendocino County organizations and residents to biomass utilization

[25]Interview with Phil Shuster, Owner, Shuster Trucking.

technologies and initial findings of TSS's review of biomass availability within the county. See Appendix G for the workshop participant sign-up sheet.

A workshop questionnaire was distributed immediately following the workshop. Results of the questionnaire are presented in Appendix H and indicate strong interest to continue discussions regarding potential biomass power generation facilities located in Mendocino County. Sentiments gleaned from the results of the questionnaire include:

- There is significant support for one or more biomass power facilities within Mendocino County.
- Scale of the facility would be critical. There was some concern that large-scale facilities may outpace the available resource base and impact forest ecosystems as additional biomass fuel is removed.
- Over 13 locations for a biomass power generation facility were suggested.

As follow up to this workshop and in support of continued dialogue with Mendocino County stakeholders, TSS recommends the following.

- Provide all participants access to PowerPoint presentations utilized during the workshop. This can be facilitated in several ways:
    - Mail a compact disk with PowerPoint presentations
    - Post PowerPoint presentations on a website for easy access
- Arrange for a followup workshop targeting any interested parties and focused on local renewable energy generation efforts. The initial workshop participation was by invitation; this second workshop should target all interested parties and organizations.
- Utilize one central website as an information-sharing site to post notices on upcoming meetings/workshops and to provide a focal point for Mendocino County residents to secure additional information.

Siting of Biomass Power Facilities

It is clear from interviews conducted by TSS and from discussions during the August 1 workshop that there is strong support within Mendocino County for the siting of one or more biomass power generating facilities. As mentioned earlier in this review, potential environmental impacts from the facility and the scale of a potential facility are of primary concern to many stakeholders.

For these reasons, TSS recommends that consideration for siting a biomass power plant in Mendocino County include the following.

- Small scale (1MW or less) biomass power generation technologies should be considered at selected sites that have the ability to utilize on site or sell to a willing, financially stable buyer both heat and power that would be produced at

such a facility. Several candidate sites were mentioned during interviews and workshop discussions:

- Parlin Fork Conservation Camp near Jackson State Forest
- Snow Mtn. Tree Farm (former Louisiana Pacific sawmill site at Potter Valley)

- Large scale (5MW or larger) biomass generation facilities should be considered for sites that currently support industrial or commercial operations that can utilize heat and power produced. Candidate sites mentioned during interviews and workshop discussions included:
  - Forest products manufacturing sites in Ukiah
  - Co-located with new water treatment facility near Fort Bragg
  - Former forest products manufacturing site in Ukiah

TSS recommends that the North Coast RC+D Council consider distributing this biomass availability and feasibility review document to prospective biomass power project developers.

APPENDIX A

MENDOCINO COUNTY VEGETATION COVER AND LAND OWNERSHIP DETAIL

Spatial Informatics Group, LLC	Mendocino County: Vegetation vs. Land Ownership Cross Table										
(Acres)	Land Ownership										
Vegetation (CVEG)	Private	TNC	CDFG	CDF	CDPR	State Lands	Mendocino NF	BIA	BLM	Air Force	Grand Total
BLUE OAK FOOTHILL PINE	6,065						1,006	13	838		7,921
BLUE OAK WOODLAND	7,693						1,568	100	679		10,040
VALLEY OAK WOODLAND	3,282							924			4,205
COASTAL OAK WOODLAND	5,154							22	207		5,383
PONDEROSA PINE	6,343					6	5,496	314	210		12,369
RED FIR							51				51
WHITE FIR	492					9	17,071		63		17,636
REDWOOD	500,229	730		48,472	9,725			69	521	63	559,810
JEFFREY PINE	221		8				900	14	295		1,439
KLAMATH MIXED CONIFER	1,857		477	42		55	21,858	232	2,629		27,151
DOUGLAS FIR	285,322	3,472	1,707	203	1,011	21	63,400	12,275	26,246		393,658
EUCALYPTUS	62				2			4			68
ALL VEGETATION TYPES THAT MAY GENERATE BIOMASS	*816,720*	*4,202*	*2,192*	*48,718*	*10,738*	*91*	*111,350*	*13,966*	*31,689*	*63*	*1,039,730*
LACUSTRINE	4,755				74		23	51	215		5,117
MIXED CHAPARRAL	51,137	93	345	35	75	128	9,717	8	14,322		75,859
MONTANE CHAPARRAL	990					13	6,749		295		8,047
MONTANE HARDWOOD	547,383	2,464	623	175	1,098	103	31,221	20,560	27,265	14	630,907
MONTANE HARDWOOD CONIFER	73,984	139	109	401	470	18	10,869	914	2,837	4	89,744
CHAMISE-REDSHANK CHAPARRAL	18,381					464	3,522	9	14,396		36,772
CLOSED CONE PINE-CYPRESS	27,225			1,091	961		253	158	2,668		32,356
COASTAL SCRUB	10,359			468	384			62	34	9	11,314
WET MEADOW	173						47				220
SALINE EMERGENT WETLAND	23										23
MONTANE RIPARIAN	5,337			50	415	10	112	112	32		6,068
ANNUAL GRASS	210,342	54	98	167	1,468	6	9,180	8,417	2,594	7	232,333
AGRICULTURE-CROPS	45,978				302			4,502			50,782
URBAN	12,698			28	57			101		21	12,906
BARREN	6,640	9	2	19	1,076	6	2,110	386	743		10,992
Grand Total	1,832,126	6,960	3,368	51,151	17,118	840	185,152	49,247	97,090	119	2,243,171

APPENDIX B

MEMORANDUM TO CDF REGION CHIEFS REGARDING IMPLEMENTATION OF VEGETATION MANAGEMENT PROVISIONS CONSISTENT WITH CALIFORNIA SENATE BILL 1369

State of California — The Resources Agency

Memorandum

To: Region Chiefs
Assistant Region Chiefs
Unit Chiefs

Date: November 2, 2004

Telephone: (916) 653-5968
FAX: (916) 653-9954

Website: www.fire.ca.gov

From: **James M. Wright, Deputy Director, Chief of Fire Protection**
Department of Forestry and Fire Protection

Subject: Senate Bill (SB) 1369; Changes to Public Resource Code (PRC) 4291 and Government Code (GC) 51182

Governor Arnold Schwarzenegger on September 23, 2004 signed into law Senate Bill 1369. This bill will become effective January 1, 2005.

Senate Bill (SB) 1369 amended both Public Resources Code (PRC) 4291 **and** Government Code (GC) 51182 in the following manner:

- Increases minimum clearance requirement from 30' to 100'.
- Provides for state law, or local ordinance, rule, or regulation to specify distances greater than 100'.
- Allows insurance companies to require home/building owners to maintain firebreaks greater than 100'.

GC 51182 essentially applies to LRA with Very High Fire Hazard Severity Zones and only to *occupied* dwellings/structures; PRC 4291 applies to buildings/structures in, upon, and adjacent to mountainous areas, forest-covered lands, brush-covered lands, grass-covered lands, or any land covered with flammable material.

Additionally, Senate Bill 1369 amended PRC 4291 as follows:

- In areas where PRC 4291 applies, owners proposing to build or rebuild, must obtain certification from the local building official that the proposed dwelling/structure complies with all applicable state and local building standards, including those described in subdivision (b) of GC 51189. This is the current rulemaking underway at the SFM that will "recommend building standards that provide for comprehensive space and structure defensibility to protect structures from fires spreading from adjacent structures or vegetation and vegetation from fires spreading from adjacent structures." These regulations are scheduled to be completed by January 1, 2005 (A.B. 1216).
- Owners must provide upon request, a copy of the certification to their insurance company.

PLEASE REMEMBER TO CONSERVE ENERGY. FOR TIPS AND INFORMATION, VISIT "FLEX YOUR POWER" AT WWW.CA.GOV.

- After construction, the owner must obtain from the local building official, a copy of the final inspection report that demonstrates the dwelling/structure was constructed in compliance with standards mentioned above.
- Owners must provide upon request, a copy of the final inspection report to their insurance company.
- Authorizes the Director to remove vegetation not consistent with PRC 4291 and make the expense a lien upon the property. Sacramento Fire Protection is currently working on policy and procedures for this.
- Defines "Person" as, "a private individual, organization, partnership, limited liability company, or corporation."

On the attached document, note that in paragraph (a) there is a provision for, "…. maintaining single specimens of trees, ornamental shrubbery, or similar plants that are used as ground cover." Such provision does not apply in paragraph (b) which requires, "….additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the building or structure or to the property line …" (emphasis added).

Sacramento fire protection will be discussing with the Board of Forestry and Fire Protection the possibility of rule making to describe exactly what constitutes brush, flammable vegetation, or combustible growth. In the mean time use professional judgment and common sense when advising homeowners of what vegetation needs to be removed and what can be retained in the 30 to 100 foot zone, the same way we have been advising them on PRC 4291 clearance for years. In general, the vertical and horizontal continuity of the fuel needs to be broken up. For mature trees the lowest limb should be at least 6 to 10 feet from the ground. Individual plants and brush should be well spaced, a minimum of 10 feet, and crowns of trees should be spaced 10 to 30 feet apart depending on the size of the tree. All dead vegetative material should be removed.

Some of you have had calls from the media. Below are some talking points you might consider covering with the media to get the word out.

- The new law increases the clearing requirement for defensible space from 30 to 100 feet from the structure.
- Experience has shown that 30' just was not enough, and in some cases 100 feet still may not be enough, especially on steep slopes with dense brush.
- Proper clearance dramatically increases the chance of your house surviving a wildfire.
- Proper clearance provides for firefighter safety during a firestorm.

- The important thing is to break up vertical and horizontal continuity of the fuel. For mature trees the lowest limb should be at least 6' to 10 feet from the ground. Trees should be well spaced apart.

- A Registered Professional Forester should be consulted if a landowner wants to thin trees that have commercial value. Exemptions from preparing a timber harvesting plan to thin trees for the purposes of reducing fire danger can be used.

- If a homeowner is unsure about what vegetation to cut, contact your local CDF office or local fire department for assistance. Information is also available at www.fire.ca.gov and www.firewise.org.

- Find a Fire Safe Council www.firesafecouncil.org near you for help and assistance.

- Think about how you will dispose of brush and vegetation. Some areas have chipping services for little or no fee. If you intend to burn, do all your cutting and burning before next fire season. Check with your local fire protection agency and air quality/pollution district for permit requirements before burning. Plan ahead.

For your convenience ~~Strikeout~~ and underscore text showing the changes to PRC 4291 and GC 51182 is attached to this memo. The attached document will assist you in determining the exact changes made to the law.

ah

cc: Director
State Fire Marshall
Assistant Deputy Director FRAP
Assistant Deputy Director – Fire Protection
Assistant Deputy Director – Management Services
Region Fire Prevention Program Managers
CDF Legislative Office

APPENDIX C
GOVERNOR'S BIOENERGY EXECUTIVE ORDER

Please click here to return to the previous page.

Executive Order

EXECUTIVE DEPARTMENT

STATE OF CALIFORNIA

EXECUTIVE ORDER S-06-06
by the
Governor of the State of California

WHEREAS, abundant biomass resources from agriculture, forestry and urban wastes can be tapped to provide transportation fuels and electricity to satisfy California's fuel and energy needs; and

WHEREAS, ethanol is a renewable transportation biofuel that California consumes more than 900 million gallons a year which is approximately 25 percent of all the ethanol produced in the United States; and

WHEREAS, California produces less than five percent of the ethanol it consumes; and

WHEREAS, biomass fuels, including ethanol produced from cellulose and bio-diesel produced from a variety of sources, can reduce the state's reliance on petroleum fuels and work to lower fuel costs for consumers; and

WHEREAS, in the Hydrogen Highway plan, the state has invested $6.5 million to support a network of more than 16 filling stations and a growing fleet of cars and buses that run on this clean fuel of the future; and

WHEREAS, biofuels can be a clean, renewable source for hydrogen; and

WHEREAS, biofuels offer greenhouse gas reduction benefits; and

WHEREAS, biomass as a source of energy has the potential to power more than three million homes or produce enough fuel to run more than two million automobiles on an annual basis; and

WHEREAS, biomass is a renewable resource which currently contributes two percent of the state's electricity mix, or nearly 1,000 megawatts of the state's generating capacity and is one of the options needed to achieve the State Renewables Portfolio Standard requirements; and

WHEREAS, improvements in the use of waste and residues from forests and farms for energy production can actually decrease the greenhouse gas emissions associated with biomass decomposition that otherwise would occur; and

WHEREAS, harnessing California's biomass resources to produce energy and other products is good for the state's economy and environment and contributes to local job creation; and

WHEREAS, the increased use of biomass resources contributes solutions to California's critical waste disposal and environmental problems, including the risk of catastrophic wild fires, air pollution from open field burning, and greenhouse gas emissions from landfills; and

WHEREAS, sustained biomass development offers strategic energy, economic, social and environmental benefits to California, creating jobs through increased private investment within the state.

NOW, THEREFORE, I, ARNOLD SCHWARZENGGER, Governor of the State of California, by virtue of the power invested in me by the Constitution and the statutes of the State of California, do hereby order effective immediately:

1. The following targets to increase the production and use of bioenergy, including ethanol and bio-diesel fuels made f renewable resources, are established for California:

a. Regarding biofuels, the state produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent b 2020, and 75 percent by 2050;

b. Regarding the use of biomass for electricity, the state meet a 20 percent target within the established state goals for renewable generation for 2010 and 2020; and

2. The Secretary for the California Resources Agency and the Chair of the Energy Resources Conservation and Development Commission ("Energy Commission") shall coordinate oversight of efforts made by state agencies to pron the use of biomass resources; and

3. The Air Resources Board, Energy Commission, California Environmental Protection Agency, California Public Utilitie Commission, Department of Food and Agriculture, Department of Forestry and Fire Protection, Department of General Services, Integrated Waste Management Board, and the State Water Resources Control Board shall continue to participate on the Bioenergy Interagency Working Group chaired by the Energy Commission; and

4. The Energy Commission shall coordinate with other responsible state agencies to identify and secure federal and st funding for research, development and demonstration projects to advance the use of biomass resources for electricity generation and biofuels for transportation; and

5. The Energy Commission shall report to the Governor and the State Legislature through its Integrated Energy Policy Report, and biannually thereafter, on progress made in achieving sustainable biomass development in California; and

6. The California Air Resources Board is urged to consider as part of its rulemaking the most flexible possible use of biofuels through its Rulemaking to Update the Predictive Model and Specification for Reformulated Gasoline, while preserving the full environmental benefits of California's Reformulated Gasoline Programs; and

7. The California Public Utilities Commission is requested to initiate a new proceeding or build upon an existing proceeding to encourage sustainable use of biomass and other renewable resources by the state's investor-owned utilities; and

8. As soon as hereafter possible, this Order shall be filed with the Office of the Secretary of State and that widespread publicity and notice be given to this Order.

IN WITNESS WHEREOF I have here unto set my hand and caused the Great Seal of the State of California to be affixed this the twenty-fifth day of April 2006.

/s/ Arnold Schwarzenegger

Governor of California

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APPENDIX D
PG&E 2006 Renewable RFO
Notice of Intent to Bid

This Notice of Intent to Bid ("NIB") shall serve as notice to PG&E that the company listed below ("Bidder") is interested in participating in PG&E's 2006 Renewables Request for Offers ("RFO").

PG&E requests that the Bidder return this nonbinding NIB by Monday, July 10, 2006. The NIB should be returned to the contact listed below (through either email or fax).

Bidder:	
Full legal name of Bidder:	
Bidder address:	
Contact:	
Name:	
Title:	
Address (if different from above):	
Phone number:	
Cell number:	
Fax number:	
Email address:	
Names of Bidder's Conference Attendees:	
Project Name:	
Project Acquisition (PSA)? (Y/N)	
Site Acquisition? (Y/N)	
5-year Buyout Option? (Y/N)	
10-year Buyout Option? (Y/N)	
Technology Type	
Product (Baseload, Peaking, Dispatchable or As-Available)	
Contract Capacity (MW)	
Approx. Annual MWHrs	
Est. Commercial Operation Date	
Project Location	
Brief Description of Project	

Return by email or fax to:
Dave Landes

Energy Supply Department.
245 Market Street, Room 1245B (MC – N12E)
San Francisco, CA 94105
Phone: (415) 973-9326
Facsimile: (415) 973-2207
Email: RenewableRFO@pge.com

APPENDIX E
Proposed Terms of
Power Purchase Agreement

for

Completed Biomass Electric Generation Projects (no construction required for full offered deliveries)

By and Between

SACRAMENTO MUNICIPAL UTILITY DISTRICT

And

November xx, 2006

Seller: Seller (Seller)

SMUD: The Sacramento Municipal Utility District (SMUD)

Source Project: Electric generation from _____Biomass fueled generators located at _____.

Total Net Project Capacity: XX.X MW (see definitions this is a defined term)

Contract Capacity: With the exception of Planned Outages, forced outages (including derates), and Force Majeure, the amount of Capacity that shall be provided from the Project to SMUD at the Delivery Point shall be: XX.X MW.

First Deliveries Date: The First Deliveries Date shall be yyyy y, 200y.

Delivery Term: First Deliveries Date through xxxx xx, 20xx.

Delivery Point: Depending on the Project location the Delivery Point shall be as follows:

PROJECT LOCATION	**DELIVERY POINT**
Within the SMUD Distribution Service Territory (see definitions – the SMUD Distribution Service Territory is smaller than the SMUD Control Area)	The point of interconnection between the Project and the SMUD Distribution System or SMUD Transmission System
Within the SMUD Control Area, but outside of the SMUD Distribution Service Territory	The point at which the Host Electric Utility delivers* the power to a high voltage Transmission System of an electric utility within the SMUD Control Area
Within the California Independent System Operator (CAISO) Control Area	The point at which the Host Electric Utility delivers* the power to a high voltage Transmission System controlled by the CAISO
Pacific Northwest (via AC transmission)	The California Oregon Border
Other areas outside of both the SMUD and CAISO Control Areas	A specific point of interconnection with either the CAISO Control Area or the SMUD Control Area (Seller will be responsible for any TMM)
* See the Section on Distribution Service	

The specific Delivery Point, in compliance with the chart above, is _____;

Product Type: Unit Contingent Firm Power (Capacity and Energy) in the amount of the Contract Capacity with Environmental Attributes (as evidenced by Renewable Energy Credits or "RECs"). Environmental Attributes shall be delivered in an amount equal to the Energy actually produced by the Project and delivered to SMUD at the Delivery Point. Unit Contingent Firm Power means that the Energy, Capacity and RECs (the "Products") subject to this transaction shall be supplied only from the Project, and shall be supplied from the Project whenever available, that Seller has an obligation to maximize availability, and that Seller may not interrupt deliveries for economic reasons. Deliveries may be interrupted/reduced only due to Force Majeure, Planned Outages and forced outages (and derates). This is also a baseload transaction in that the Energy and Capacity are delivered in all hours of the Delivery Term.

Total Price: $xx.xx/MWh in total, which shall be split into $x.xx/MWh for the REC ("REC Price") and $xx.xx/MWh [or index price description goes here if applicable] for the Energy ("Energy Price"). Seller and SMUD shall negotiate a split of the total price, such that the REC Price component is no less than 5 percent, and no greater than 15 percent of the total price.

Price Escalation: On the first day of the second full year of the Delivery Term, and annually thereafter, the Energy Price shall be increased by x.xx%. (SMUD will favor proposals that escalate only the portion of costs related to operating and maintenance or other legitimate forms of expected cost inflation. SMUD generally does not view capital costs as such.)

REC Payment: SMUD shall pay the negotiated REC Price to Seller for the volume (MWh) of RECs associated with the actual Energy generation produced by (the SMUD Project Percentage Share of) the Project and delivered to SMUD at the Delivery Point for which a corresponding Attestation and Bill of Sale (or other mutually agreed documentation) has been delivered to SMUD.

Energy Payment: SMUD shall pay the negotiated Energy Price for the amount of Energy that is delivered to SMUD at the Delivery Point. All hourly deliveries shall be in whole MWh's unless the Project is within the SMUD Distribution Service Territory, or unless SMUD is performing the Scheduling Coordination Service on the Seller's behalf.

Credit Support during Term of Agreement: After the definitive agreement is executed, SMUD will not normally require surety of Sellers that are in good financial condition and with whom SMUD has no existing credit exposure. Should SMUD determine that Seller's financial condition, or SMUD's exposure thereto, warrants that surety be required of the Seller (for example if a rated company falls below investment grade status) then Seller shall post credit support in an appropriate amount in favor of SMUD. Prior to the Negotiation Period, SMUD will inform Seller of any initial requirement to maintain surety during the Delivery Term, which SMUD reserves the right to change based on any information which subsequently becomes known to SMUD. (Note: this Section does not refer to the letter of credit required during the Negotiation Period.)

Definition of Annual Capacity Factor (ACF): The Annual Capacity Factor for any particular Contract Year shall be equal to (a) the total MWh generated by the Project and delivered to SMUD in that Contract Year, divided by (b) the number of hours in the same Contract Year multiplied by the Contract Capacity.

Expected Annual Capacity Factor (EACF): The EACF shall be 90%, except in a Contract Year in which Seller conducts an Overhaul Outage (as defined herein), in which case the EACF shall be 85%. (It is possible that some Sellers may be able to demonstrate to SMUD's satisfaction that different numbers are warranted here due to the unique nature of a specific Project.)

Minimum Annual Capacity Factor (MACF): The MACF shall be 85%, except that in a Contract Year in which Seller conducts an Overhaul Outage (as defined herein) the MACF shall be 80%. (It is possible that some Sellers may be able to demonstrate to SMUD's satisfaction that different numbers are warranted here due to the unique nature of a specific Project.)

Planned Outages: Maintenance Outages and Overhaul Outages as defined below in this Section, shall both constitute Planned Outages. Seller may not schedule or take any Planned Outages in the Months of June through September, unless otherwise agreed by the Parties in writing. Seller shall take all reasonable measures to minimize the frequency and actual duration of Planned Outages. Further, Planned Outages do affect the Annual Capacity Factor as defined herein. All Planned Outages shall be scheduled in advance according to notice provisions to be negotiated.

Maintenance Outages. "Maintenance Outages" shall mean outages that conform to the requirements of this Subsection. In every Contract Year in which Seller does not conduct an Overhaul Outage, Seller shall be entitled to take two (2) Maintenance Outages; provided, however, that (a) each Maintenance Outage shall be scheduled no less than four (4) months apart; and (b) the cumulative duration of all Maintenance Outages scheduled for each Contract Year shall not exceed fourteen (14) days.

Overhaul Outages. "Overhaul Outages" shall mean outages that conform to the requirements of this Subsection. No more than once every five (5) years during the Delivery Term, Seller shall be entitled to take one (1) Overhaul Outage and one (1) Maintenance Outage in a single Contract Year; provided, however, that (a) the Overhaul Outage and the Maintenance Outage shall be scheduled no less than four (4) months apart; (b) the duration of the Overhaul Outage shall not exceed twenty-one (21) days; and (c) the total cumulative duration of any Maintenance Outage and Overhaul Outage in a single Contract Year shall not exceed twenty-eight (28) days.

Project Performance Adjustment: Seller shall follow prudent utility practices as well as all manufacturer's guidelines and warranty requirements in operating and maintaining the Project and shall make any needed repairs in a reasonably timely manner so as to maximize the availability for generation of electricity. Provided that Seller has complied with the foregoing and any other contractual obligations, then damages for failure to

achieve a reasonable Annual Capacity Factor (ACF) relative to the Expected Annual Capacity Factor (EACF) shall be limited to a financial adjustment as follow:

ACF greater than the EACF	no effect;
ACF below the EACF by less than 10%	$2 Energy Price reduction in the next year;
ACF below the EACF by 10% or more	$5 Energy Price reduction in the next year.

Conditional Right to Terminate Agreement for Sub-Standard Availability: If the Project fails to achieve the Minimum Annual Capacity Factor for any two consecutive Contract Years, including failure caused by reason of Force Majeure (Note: see cure provisions below), then SMUD shall have the right to terminate this Agreement with advance notice. Notice of such termination ("Notice of Termination") shall be given in writing a minimum of 60 days prior to effectiveness of such termination and within 120 days of the end of the second of the applicable two Contract Years. The ability to exercise such termination right shall be deferred for up to one year if Seller has demonstrated to SMUD, and is actively implementing, a reasonably acceptable plan to cure or correct any such failure or damage ("Cure Plan"). Such notice of an acceptable Cure Plan must be submitted to SMUD in writing within fifteen (15) Business Days of Seller's receipt of SMUD's Notice of Termination. SMUD shall then have fifteen (15) Business Days after SMUD's receipt of the notice of Cure Plan to inform Seller in writing of the acceptance or rejection of the Cure Plan, which it will not unreasonably reject. If SMUD rejects Seller's Cure Plan the Parties will continue reasonable efforts to agree upon an acceptable alternate Cure Plan prior to the effective date of termination. Failing such efforts the Agreement shall terminate pursuant to SMUD's Notice of Termination.

Provision of Operating Reserves and Hourly Firming: Unless the Project is located in the SMUD Distribution Service Territory, Seller shall provide Operating Reserves for all schedules hereunder. Payment of any Liquidated Damages does not relieve Seller of its obligation to arrange for the provision of Operating Reserves. Seller shall ensure that it delivers to SMUD all Scheduled Project Energy in the amount of the Hour-Ahead Schedule, once established, regardless of the actual amount of Project Energy generated in such hour, including the provision of Energy at Seller's expense from other sources (such as, without limitation, from a third party provider of Operating Reserves or the CAISO) when Project Energy from SMUD's Project Percentage Share does not match the scheduled Project Energy.

Interconnection Costs: Should the Project at some time during the term of this agreement become located within SMUD's Distribution Service Territory, Seller agrees to incur those costs imposed by SMUD which are the customary requirements that SMUD imposes upon similar generators interconnected to the SMUD distribution system, provided that Seller shall not be required to bear any costs attributable to any decision by SMUD to create or require a new interconnection between the Project and the SMUD distribution system or the SMUD Transmission System.

Interconnection at SMUD's Request: With regard to Projects that are not initially connected within the SMUD Control Area or SMUD Distribution Service Territory (as applicable), Seller shall provide any reasonable cooperation requested by SMUD in establishing a direct interconnection (or Dynamic Scheduling arrangement) between the Project and the SMUD Control Area or the SMUD Distribution System at SMUD's sole

cost. Seller acknowledges that should the Project ever be interconnected with the SMUD Distribution System or the SMUD owned Transmission System, then Seller shall be required to execute a Coordination and Interconnection Agreement with SMUD before operation of the Project within the SMUD System.

Emissions Credits: Seller will be responsible for acquiring all necessary emissions credits for operation of the plant at the highest capacity factor achievable.

Fuel Supply: Seller shall use best efforts to obtain the necessary Renewable Fuel to operate the Project so as to deliver to SMUD Power from the Project at the Delivery Point in the amount of the Contract Capacity throughout all hours of the Delivery Term, except to the extent that it is known in advance that the Project will not be operating due to a Planned Outage, Force Majeure or Forced Outage. Seller shall not exceed the maximum allowed usage of supplemental fuel (which is not Renewable Fuel) to qualify as an Eligible Renewable Energy Resource with the California Energy Commission. Seller shall specify the assumed amount of supplemental fuel use, if any, (other than Renewable Fuel) upon which it's offered price is based. Adjustments to the price for exceeding this amount of supplemental fuel use will be negotiated, if applicable.

Transmission: Seller shall deliver Energy to the Delivery Point using Firm Transmission, meaning that the applicable transmission provider(s) will provide transmission service for the entire Contract Capacity during all hours of the Delivery Term.

Distribution Service: For Projects not located within SMUD's Distribution Service Territory, the Seller shall be responsible for obtaining (at Seller's sole cost), from the applicable Host Electric Utility, any Distribution Service necessary for deliveries hereunder. Such service may be required for Seller to transmit power up to the high voltage Transmission System (as opposed to the Distribution System) of an applicable transmission provider, such as the CAISO.

Scheduling Coordination Service: Unless otherwise agreed in writing, Seller shall be responsible for meeting all requirements of any transmission providers as necessary to ensure the required deliveries at the Delivery Point, including the performance of Scheduling Coordinator duties required by the CAISO, if applicable. For practical purposes, SMUD may at its sole election consider offering Scheduling Coordination Service to Sellers with small Projects for appropriate compensation.

Transmission Losses and Meter Multipliers:
Except as specifically stated otherwise, all Capacity and Energy amounts specified herein are amounts as provided at the Delivery Point, without additional reduction by Transmission Losses, Generator Meter Multipliers or Transmission Meter Multipliers incurred by Seller in transmitting such products to the Delivery Point. Seller shall have considered such factors prior to specifying the amount of net Energy and Capacity to be made available at the Delivery Point. All Schedules shall be for amounts to be delivered to SMUD or to be provided on SMUD's behalf at the Delivery Point. In the case of

Projects located in the SMUD Distribution Service Territory for which Energy is measured using a SMUD Revenue Meter, a SMUD Loss Factor shall be applied to the SMUD Revenue Meter Data to determine the amount of Energy delivered to the Delivery Point.

Liquidated Damages for Energy, Capacity or Environmental Attributes: Except where such failure is excused by either (a) the other Party, (b) the other Party's failure, or (c) by reason of Force Majeure, a Party's material failure to receive or deliver Energy, Capacity and Environmental Attributes (or the corresponding attestation) as required herein, shall constitute a breach and each party has an otherwise unqualified obligation to make such receipts or deliveries. However, as a practical matter for unforeseen events, the Party's shall negotiate and agree upon specific Liquidated Damages mechanisms which the non-breaching Party may pursue as one potential remedy for any such event (whether deemed material or not). With regard to failure to receive or deliver Capacity and Energy, the parties will make use of commercially reasonable replacement costs, when applicable, or when such Capacity and Energy is not replaced, the Parties shall make use of market prices or indices that are most appropriate for the Delivery Point. Failure to deliver Environmental Attributes or the corresponding attestation as required herein shall make Seller liable for Buyer's replacement costs or the REC Price, whichever is greater. Further, Buyer may withhold payment of the REC Price until suitable delivery or settlement of replacement costs occurs. Seller has an unqualified obligation to deliver the Energy, Capacity and Environmental Attributes and SMUD has an unqualified obligation to receive such deliveries, and neither Party shall rely on Liquidated Damages as an alternative to delivery.

CAISO and Transmission Provider Fees: All charges and costs charged to generators or experienced in getting the power to the "Delivery Point", which shall include any GMM or TMM, shall be borne by Seller. All charges and costs charged to loads or experienced in taking delivery at the "Delivery Point" including any congestion costs experienced in further transmission of the power to the SMUD Control Area shall be borne by SMUD.

Resource Adequacy and Congestion Hedging Rights: Seller shall attest to any authorities, as necessary, as to SMUD's exclusive rights to the Energy, Capacity and RECs from the project, as necessary for scheduling, satisfaction of any resource adequacy requirements, transmission service applications or congestion management purposes.

Right of First Look: In the event that Seller expands its generation Capacity at the general location of the Project (beyond the Contract Capacity), Seller and SMUD shall make good faith efforts, for a period of at least 90 days, to negotiate an agreement for the sale of the additional Energy and RECs to SMUD, prior to Seller's offering of such to any third party. In such negotiations, neither party shall be required to reach an agreement or accept any particular terms.

Defined Terms: Capitalized words for which the definition does not appear in this term sheet shall have the meaning given in the list of defined terms included in the SMUD Request for Offers document.

APPENDIX F
Mendocino County Biomass Utilization Workshop

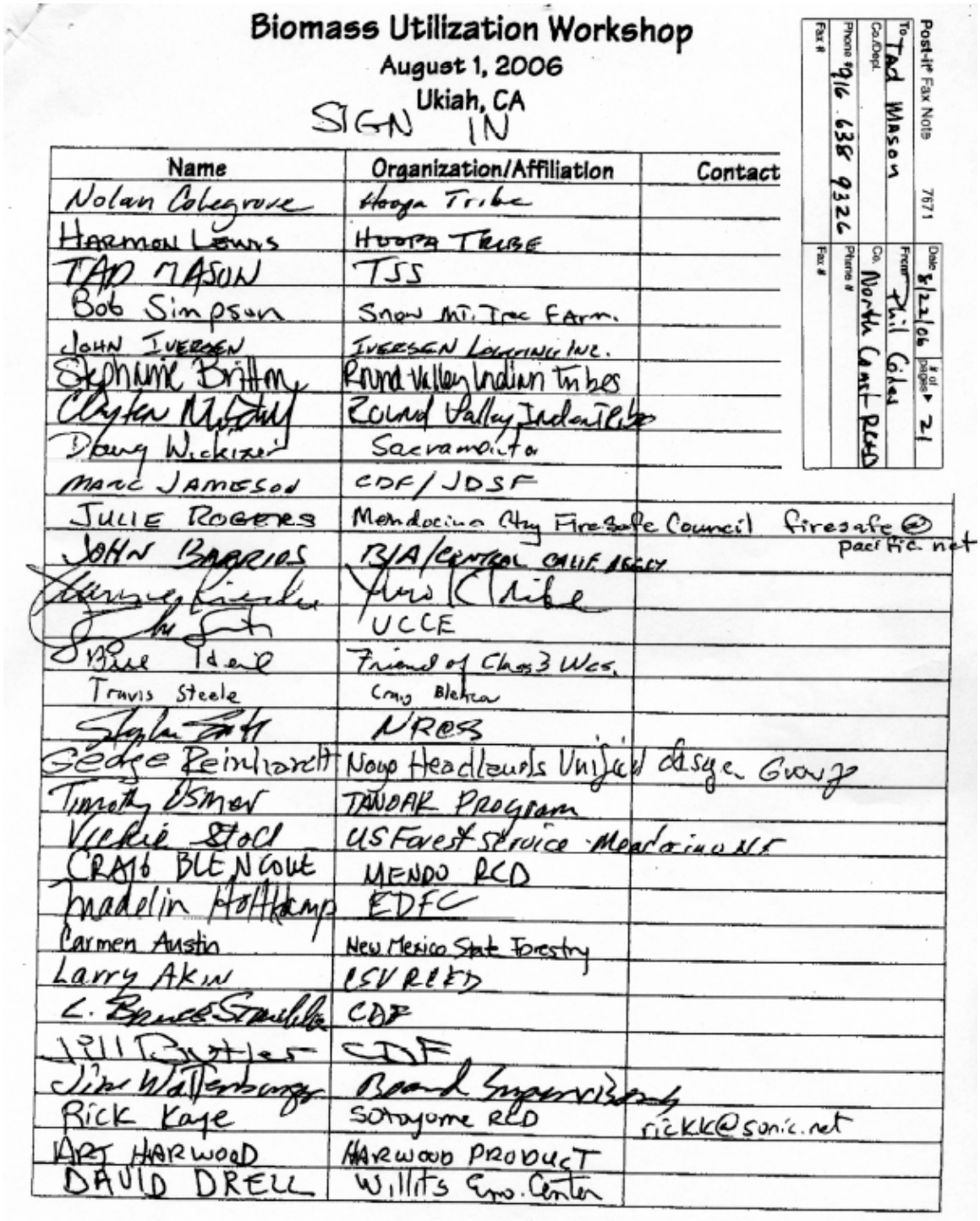
Tuesday, August 1, 2006
Hampton Inn, 1160 Airport Park Boulevard, Ukiah, CA
Sponsored by
USDA Forest Service, Region 5; University of California Cooperative Extension; California Department of Forestry; North Coast Resource Conservation & Development Council; and, Mendocino County Resource Conservation District

AGENDA

8:30 AM	Registration
9:00	Introduction – *Bruce Goines, Biomass Utilization Specialist,, USDA FS, Vallejo; John Shelly, Woody Biomass Advisor, UC Cooperative Extension, Berkeley, CA*
9:10	Forest Resource Management and Fire Protection Issues – *Craig Blencowe, Director, Mendocino County Resource Conservation District and Registered Professional Forester, Ukiah; Greg Giusti, Natural Resources Advisor, UC Cooperative Extension, Mendocino and Lake Counties, Ukiah, CA*
9:30	Woody Biomass Utilization Challenges and Opportunities: potential products, available technologies, and needs for success – *John Shelly, Woody Biomass Advisor, UC Cooperative Extension, Berkeley, CA*
10:30	Break
10:45	Engineering and Economic Considerations for Biomass to Energy Conversion Technologies and Tribal Opportunities for Biomass Energy – *Scott Haase, Renewable Energy Engineer, Bureau of Indian Affairs, Division of Energy and Mineral Development, Denver, CO*
12 Noon	Lunch (provided)
1:00 PM	Mendocino County Biomass Availability Review and Bio-Power Development Opportunities – Initial Observations *Tad Mason, TSS Consultants, Rancho Cordova, CA*
2:00	A View of the Sierra Experience with Woody Biomass – *Warren Alford, Fire and Fuel Policy Coordinator, Sierra Nevada Forest Protection Campaign, Avery, CA*
2:30	Break
2:45	The Mendocino County Practicum: economic, environmental, and social considerations. – *Madeline Holtcamp, Economic Development and Financing Corporation Representative, Ukiah, CA; Chris Brown, Air Quality Planner, Mendocino County Air Quality Management District, Ukiah, CA; Jere Melo, Registered Professional Forester and Fort Bragg City Council Member, Fort Bragg, CA*
3:45	Panel Discussion: question and answer session – *all speakers*
4:30	Closing Comments – *Ron Rolleri, Director, North Coast Resource Conservation and Development, President-Sotoyome Resource Conservation District, Santa Rosa, CA*
4:45	Adjourn

APPENDIX G

BIOMASS UTILIZATION WORKSHOP PARTICIPANTS SIGN-IN SHEET



Biomass Utilization Workshop

August 1, 2006

Ukiah, CA

SIGN IN

Post-it® Fax Note 7671 | Date 8/22/06 | # of pages ▶ 2

To Tad Mason | From Phil Colegrove

Co./Dept. | Co. North Coast RCD

Phone # 916 638 9326 | Phone #

Fax # | Fax #

Name	Organization/Affiliation	Contact
Nolan Colegrove	Hoopa Tribe	
Harmon Lewis	Hoopa Tribe	
TAD MASON	TSS	
Bob Simpson	Snow Mt. Tree Farm.	
JOHN IVERSEN	IVERSEN LUMBER INC.	
Stephanie Britton	Round Valley Indian Tribes	
Clayton Mitchell	Round Valley Indian Tribes	
Doug Wickizer	Sacramento	
Marc JAMESON	CDF/JDSF	
JULIE ROGERS	Mendocino City Firesafe Council	firesafe@pacific.net
JOHN BAGLIEN	BIA/Central Calif. Agency	
[illegible]	Yurok Tribe	
[illegible]	UCCE	
Steve Tidwell	Friends of Chas 3 Wks.	
Travis Steele	Cmty Biomass	
[illegible]	NRCS	
Gedge Reinhardt	Novo Headlands Unified Assessment Group	
Timothy Osmer	TANOAK Program	
Vickie Stoll	US Forest Service - Mendocino NF	
CRAIG BLENCOWE	MENDO RCD	
Madelin Hoffkamp	EDFC	
Carmen Austin	New Mexico State Forestry	
Larry Akin	ESV RCD	
L. Bruce Stubblefield	CDF	
Bill Buttles	CDF	
Jim Wattenburger	Board Supervisor	
Rick Kaye	Sonoma RCD	rickk@sonic.net
ART HARWOOD	HARWOOD PRODUCT	
DAVID DRELL	Willits Env. Center	

Biomass Utilization Workshop

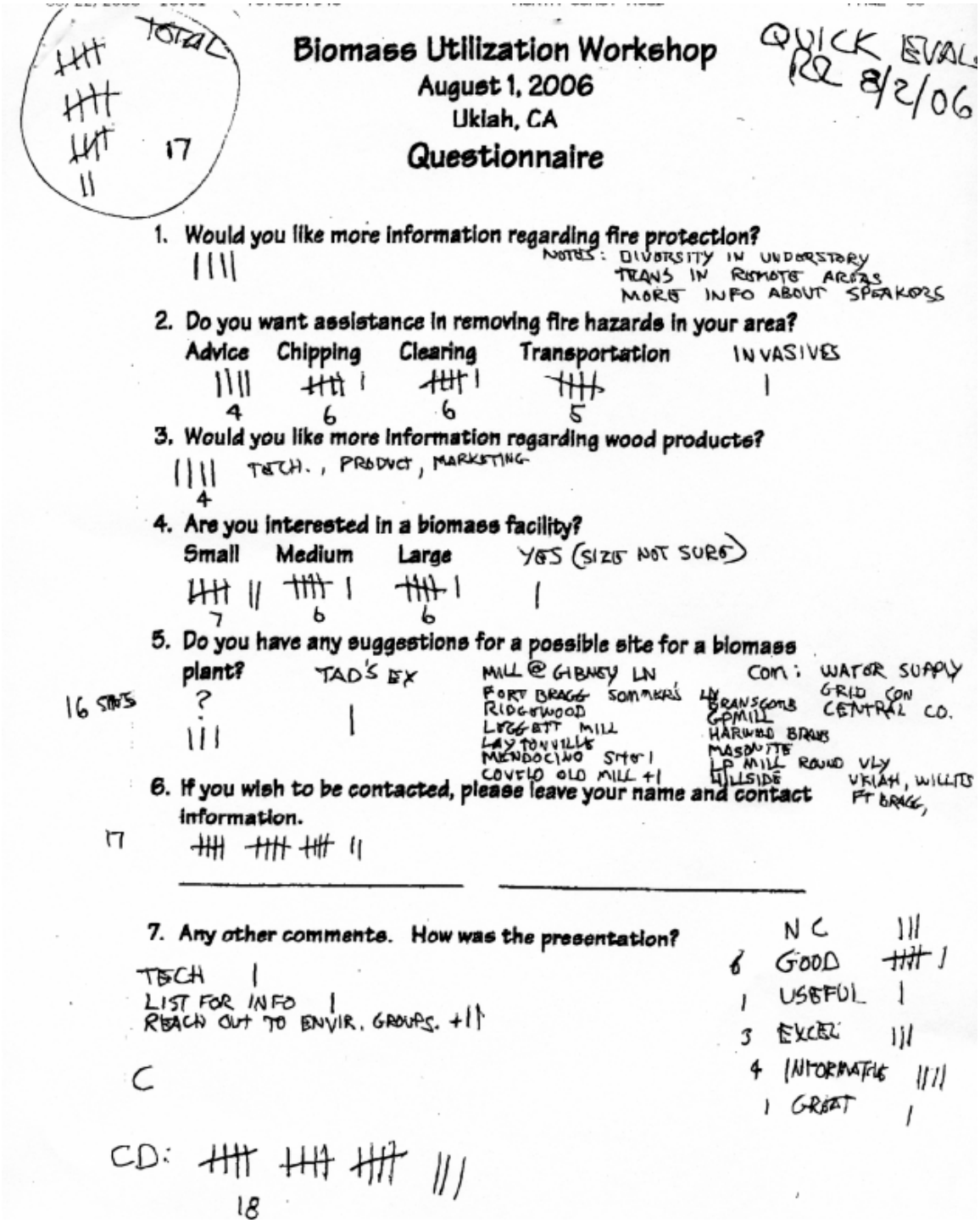
August 1, 2006

Ukiah, CA

Name	Organization/Affiliation	Contact/Comments
JERÉ MELO	City of Fort Bragg	
Jim ANDERSON	CDF - RETIRED	
BILL WILLEFORTH	RVIR	
Wallace Stahle		
Scott Hare	BIA	
ERIC JERGENSON	REDI	
Thembi Borras	Borras Forestland + Road Mgmt	
Steph Levesque	Campbell	
Chuck Williams	Redwood Valley Res.	
Philip Giles	NPACS - NorthCoast RC&D	
Reinhold Ziegler	Ed Burton Company	
Douglas S. Livingston	Livingston Const. Mtls	
Ed Burton		
Paul Taylor	Mendo Co DOT/SWD	
RON ROLLERI	NC RC+DC	

APPENDIX H

BIOMASS UTILIZATION WORKSHOP QUESTIONAIRE
SUMMARIZED RESULTS



TOTAL 17

QUICK EVAL RQ 8/2/06

Biomass Utilization Workshop
August 1, 2006
Ukiah, CA
Questionnaire

1. **Would you like more information regarding fire protection?**
   ||||
   NOTES: DIVORSITY IN UNDERSTORY
   TRANS IN REMOTE AREAS
   MORE INFO ABOUT SPEAKERS

2. **Do you want assistance in removing fire hazards in your area?**
   Advice 4 **Chipping** 6 **Clearing** 6 **Transportation** 5 INVASIVES 1

3. **Would you like more information regarding wood products?**
   |||| 4 TECH., PRODUCT, MARKETING

4. **Are you interested in a biomass facility?**
   Small 7 **Medium** 6 **Large** 6 YES (SIZE NOT SURE) 1

5. **Do you have any suggestions for a possible site for a biomass plant?**
   16 SITES ? 111 TAD'S EX 1
   MILL @ GIBNEY LN
   FORT BRAGG SOMMERS LY
   RIDGEWOOD
   LEGGETT MILL
   LAYTONVILLE
   MENDOCINO STAT
   COVELO OLD MILL +1
   BRANSCOMB
   GPMILL
   HARWOOD BRNS
   MASONITE
   LP MILL ROUND VLY
   HILLSIDE
   COM: WATER SUPPLY
   GRID CON
   CENTRAL CO.
   UKIAH, WILLITS FT BRAGG,

6. **If you wish to be contacted, please leave your name and contact information.**
   17 ||||| ||||| ||

7. **Any other comments. How was the presentation?**
   TECH 1
   LIST FOR INFO 1
   REACH OUT TO ENVIR. GROUPS. +1
   C
   CD: ||||| ||||| ||||| ||| 18
   NC |||
   8 GOOD ||||| |||
   1 USEFUL |
   3 EXCEL |||
   4 INFORMATIVE ||||
   1 GREAT |