

Motion to Intervene in FERC Docket No. P-13053-000

**Motion to Intervene in FERC Docket No. P-13053-000
Green Wave Mendocino Wave Park Project
Green Wave Energy Solutions, LLC
Docket No. P-13053-000
Green Wave Mendocino Project**

Filed February 09, 2009

Filed by: Individual
Tomas DiFiore
POB 612 Little River, Ca 95456
iamtomas@mcn.org
Secondary and Subsistence Fisheries Seaweed Harvester

**MOTION TO INTERVENE AND COMMENTS/PROTEST
REGARDING PRELIMINARY APPLICATION**

Filed: Opposition to Green Wave Mendocino Project Docket No. P-13053-000

Pursuant to Rule 214(d) of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission, 18 CFR § 385.214, and the Commission's December 9, 2008 *Notice of Filing and Soliciting Comment, Motions to Intervene and Competing Applications*, I hereby respectfully request that the Commission accept and grant this Motion to Intervene to obtain party status in the above referenced proceedings related to the Green Wave Energy Solutions, LLC "Green Wave" application for a preliminary permit to begin evaluation for the Green Wave Mendocino Project (a.k.a. Green Wave Mendocino Wave Park Project) hydrokinetic ocean power project.

This filing is of sufficient factual detail and meets the requirements of substantial evidence to support a fair argument under all State and Federal laws pertaining to Environmental Impacts Assessment. My filing is to demonstrate that (as a 28 year resident of the Mendocino coast and Seaweed harvester for over 25 of those years) I do have and represent, an interest that may be directly affected by the outcome of the FERC proceeding and that Intervenor status is necessary and requested.

The potential for significant impacts to the sensitive coastal environment (nearshore, coastal waters, tidal and intertidal zones, open ocean and the estuarine and onshore habitats) and related coastal communities livelihoods based upon these resources (Fisheries, Secondary Fisheries, Subsistence, Tourism, Open Space), is monumental, like Easter Island. Especially unique to this particular area geographically are the Cetacean migrations.

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Besides one or two particular questions regarding Intervenor status and response abilities, which appear at the end, **all comments are submitted to address areas of concern (social/ecologic/economic impacts) and/or opposition to Green Wave Mendocino Wave Park Project, as described in Docket No. P-13053-000 Green Wave Energy Solutions, LLC,** regarding the deployment, infrastructure support, onshore facilities, and actual need for testing and development based upon Permit application description and location.

***Concern is expressed for any unknown supplemental and future energy or technology siting in conjunction with any deployment of WEC devices whether or not an array is connected to the grid based upon use and amounts of consumption/production and/or purchase/sale of specified resources expected to be replaced by the proposed project.

***Just as one year ago in Fort Bragg, PGE tried to get by and not fully inform coast residents by stating that the PGE WaveConnect industrial park project would not be visible from shore... By leaving out information such as that which is most useful...

WAVE Energy Farms will nearly always be visible
from every coastal home, hotel & motel, B & B, scenic drive, & the bluffs,
the Skunk Depot, & every east / west road and street with a view to the horizon.

As defined in the Boswitch's Table 20;

Because of the result of the curvature of the earth, there is a maximum distance at which an object of a given height can be seen before it disappears beneath the horizon.

*A statute mile is 5,280 feet in length, a nautical mile is 6,076... feet in length.

*A Nautical Mile is 1/60th of a degree (69miles) of latitude, or one minute = 1.15 miles.

There are four common measures of distance used on charts:

- Nautical miles are used on ocean and coastal waters.
- Statute miles are used for inland areas (Intracoastal Waterway and Great Lakes).
- Yards are often used to define distances of a mile or less.
- Meters are being seen increasingly on U.S. charts and are used almost exclusively on Canadian and other charts of the world

A nautical mile is the angular distance of 1 minute of arc on the earth's surface. As these differ slightly (6108' at pole c.f. 6046' at equator) 6080 was adopted (this being it's approximate value in the English Channel). In 1929 the International Hydrographic Conference in Monaco defined the international nautical mile as exactly 1,852 meters, about 6,076.12 feet.

On the water in a sport fishing boat and height of eye is 9 feet above the surface of the water, or riding a horse on the beach:

1.17 times the square root of your height of eye = Distance to the horizon in nautical miles

1.17 times the square root of 9 = Distance to the horizon in nautical miles.

1.17times 3 = 3.51 nautical miles & 3.51 nautical miles / 1.15 = 4 statute miles.

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Whale watching tour boats offer heated views from 50 feet above the water. The average clear weather visibility on the Mendocino Coast is 10-25 miles from the bluffs.

***As proposed, **FERC Docket No. P-13053-000**, is not clear whether the calculations in text correspond to the actual distance intervals on drawings submitted and used in correspondence with the County of Mendocino, City of Fort Bragg, or the public.

***Concern is expressed about impacts to Coastal Communities and State (social) programs including local and State tax base, (ocean) land use designations and employment. The California Renewables Portfolio Standard as a market mechanism can be used to Green Up a commodity or company, but the “carbon trail” ... must be a calculated assessment of the carbon footprint of the technology from beginning (mining ore and the manufacturing process) to time in-service estimates based on planned (decommissioning), maintenance and replacement.

***Green Wave LLC and PGE's social responsibility and bankruptcy record are the subject of concern. The burden of Financial Responsibility and Accountability are to be proven.

***Before any connection to the grid is proposed all available transmission and delivery (T&D) corridors and necessary upgrades and maintenance schedules fulfilled, proposed new T&D corridors and necessary maintenance schedules (feasibility studies completed) and necessary funding in place, employment figures, liability bonds and response team coordination plans, inventoried response team equipment/locations and preparedness assessment, proof of financial and environmental bonds showing in good faith an action of responsibility accountable under law.

***Loss of access to the last Public Commons as provided for in the Constitution of the State of California must be addressed.

***As proposed, the The Green Wave project area is adjacent to the boundaries of the PG&E Wave Connect project area which covers sixty-eight (68) square miles just to the north near Fort Bragg. Consideration of Cumulative Impacts locally* (expanded to include here by definition – influences by global winds and currents, the Upwelling Current, seasonal storms) and including the open ocean shipping lanes from Alaska to San Francisco and further south, toxic drift, agricultural runoff and eutrophication, noise, carbon sequestration at sea, floating real estate, and global overlaps of military and industrial use and cost savings abuse of the ocean environment by every strata of social order to date including:

- Ocean dumping (as defined in LC72 and the 1996 Protocol intended to replace the 1972 Convention), to which China in 2007 finally became a signatory responsible nation, but ocean incineration is still allowed globally by permit.
- In-situ burning (ISB) of oil spills for quick containment is weighted by benefits to sensitive habitats of burning versus the effects resulting from the land fall of oil.

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- Document LA-LB Sector ACP Section 3000 March 30, 2006 demonstrates
- Appendix I – Overview of ISB as an Oil Spill Response Tool
- APPENDIX I OF ISB LOA
- Appendix II In-situ Burning Plan ... Appendix is an example of the information pertinent to in-situ Burning; it was developed for Oceania and adapted for the area off the California Coast.
- Toxic spills (both accidental and by conspiracy in violation of law)
- Current exploitation race for new unclaimed territory as the ice recedes
- Undersea sonic communications
- Dredging of bays and estuarine channels, and at-sea dumping of dredged materials
- Nuclear waste including test vehicles, ships, planes (i.e. Farallon Marine Sanctuary) until the ban on nuclear waste dumping in 1970
 - for thirty years, a 365 square mile area around the Farallon Islands (27 miles outside the golden gate) served as the nation's primary nuclear waste dumping ground... this area is now the farallon islands national marine sanctuary... from 1945 to 1970, when nuclear dumping at sea was prohibited, an estimated 47,500 barrels of radioactive debris from nuclear labs such as Lawrence Livermore Labs were dumped in the area...
 - ships irradiated in the Bikini Atoll nuclear bomb tests of the 1940's and '50's were sunk off the islands (including the aircraft carrier Independence), along with numerous undocumented materials... the extent of contamination in the area has not yet been fully investigated though side scan sonar from the late 90's identified close to 60,000 barrels scattered across the seafloor around the islands and near the edge of the continental shelf....

***Has Green Wave Energy Solutions, LLC researched and considered for the evaluation, validation and/or monitoring parameters, other associated scientific studies of the California, and Oregon coastlines and OCS to see how the study project area overlaps current data and historic use patterns and the cumulative impacts of both historic use and projected future scenarios (including economic and military) both nearshore and offshore?

***Green Wave Energy Solutions, LLC and FERC must consider current economic activities & cultural activities which may include Indigenous or Tribal rights to access and use.

***Has Green Wave Energy Solutions, LLC researched and considered studies and recorded data from NOAA, CalTrout, CDFG, NASA, local native tribes, immigrants, covering geological and marine estuarine influences and interactions in the area as defined in the application?

Results from CSCAPE monitoring (ongoing) show possible changes in species distribution, sometimes moving closer to immediate offshore waters. The potential to interfere with the California Upwelling Current nearshore and offshore is great due to slower movement of ocean energy between 'wave farms' and shore. This slower movement will likely lead to temperature increases having potential negative effects on anadromous fisheries restoration

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and recovery. All previous to date revenues allocated through Senate Bills subsequent to the 1997-1998 Salmon and Steelhead Trout Restoration Account (sponsored by) Senator Mike Thompson's and many Stream Restoration Funds in NW California must be figured into any equation of the merit of necessity for development.

Potential effects of a slower and warmer gentler tide and/or waves onshore and nearshore as suggested* may include anomalies in the water of

- near surface temperature and salinity,
- nitrate, chlorophyll and
- primary production anomalies.

EPRI favors the Pelamis: *according to EPRI*

“It is estimated that with current projections, a large wave energy facility with a maximum density of devices would cause the reduction in waves to be on the order of 10 to 15%, and this impact would rapidly dissipate within a few kilometers, but leave a slight lessening of waves in the overall vicinity. It is estimated that this will translate to a 5% decrease in wave height at shore.”

The Pelamis Wave Energy Converter, is a floating wave device that generates 750 kW, enough energy to power over 500 homes. The device, measures 140 m in length, 3.5 m diameter, and weighs 750 tons. The machine operates utilizing the articulation of wave energy, which is transmitted through hydraulics, run through the accumulator, to the turbine and into the generator. 40 units in an area of ocean within view of the coastal bluffs, and each has a rated nominal output of 40% which assumes larger arrays than proposed to meet actual energy production cost and delivery to the grid averaging start up investment and equipment upgrade costs over time.

***Has Green Wave Energy Solutions, LLC or FERC considered the merits of the natural carbon sink of the ocean offshore, the benthic layer depth, and the erosion that flowed seaward from 150 years of logging and burning (atmospheric deposition), offshore of what were once the largest terrestrial carbon sinks - the Ancient Redwood forests?

- What is the economic added value potential to the State and County of Mendocino in the new energy market of pollution regimes and carbon equivalence cap and trade offsets? Forests are already used within the State to offset carbon equivalence pollution.
- How will spatial requirements of overlapping multiple uses of the benthic layer of the OCS be structured within the project area? This would include impacts to gray whale migrations and feeding (gray whales feed on their right side and scoop up the top benthic layer, filtering it with their baleen). Gray Whale Obstacle Course –From the summer Arctic waters to winter in Mexico. A film by Jean-Michel Cousteau

***Consideration of Cumulative Impacts along the Northern and North Central Coastline of

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California would include: All known planned project areas, including those beyond the Mendocino Coast (Humboldt and Sonoma) though the closest would be:

FERC 2007a

PG&E Mendocino WaveConnect Project Off the coast of Mendocino County, CA
40–200 wave generators, 40 MW

PG&E Humboldt WaveConnect Project Off the coast of Humboldt County, CA
8–200 buoys, 200 kW to 1 MW each

Mendocino Wave Energy Project Off the coast of Mendocino County, CA
2–60 devices, 2–60 MW

***There are many ongoing studies and there is no need to burden the ocean, the public, ratepayers, or the process with more of the “best science money can buy”.

The following is from: STATE OF THE CALIFORNIA CURRENT CalCOFI Rep., Vol. 47, 2006

The Fishery Ecology Division of the Southwest Fishery Science Center has conducted a standardized midwater trawl survey during May–June aboard the NOAA R/V *David Starr Jordan* every year since 1983. Historically, the survey was conducted between 36°30'–38°20'N latitude (Carmel to Bodega Bay, California), but starting in 2003, coverage has expanded to effectively sample the entire coast of California.

California Current System: Summer/Fall 2005.

During CSCAPE surveys, a total of 12,954 km were surveyed systematically using standard line-transect protocols, resulting in 1,498 sightings of 21 cetacean and 5 pinniped species. The diversity of species was comparable to previous years; however the distribution of a few species differed notably. Northern fur seals (*Callorhinus ursinus*), which are commonly found at least 50 km from shore, were unusually abundant within 10 km of the central California coast during July. Fin whales (*Balaenoptera physalus*) were encountered more frequently than during previous years, and a greater number of fin whales were seen in northern offshore waters than during previous surveys, particularly compared to the 1990s

Blue whales (*B. musculus*) were also distributed more widely throughout the study area than in previous years. This may have been related to the poor recruitment of their euphausiid prey in nearshore foraging areas during 2005. As in previous years, humpback whales (*Megaptera novaeangliae*) were concentrated in nearshore waters off central California and Oregon-Washington. They were observed foraging primarily on dense aggregations of small pelagic schooling fish, particularly in nearshore regions where small cetaceans that feed on fish and cephalopods were also abundant, including Pacific white-sided dolphin (*Lagenorhynchus*

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obliquidens), northern right whale dolphin (*Lissodelphis borealis*), Risso's dolphin (*Grampus griseus*), and Dall's porpoise (*Phocoenoides dalli*).

Although the distributions of cetacean species have varied between surveys, species-environment relationships for some species have been remarkably consistent. The offshore extent of Dall's porpoise off California appears directly linked to the offshore extent of upwelling-modified waters. During all survey years, this species was primarily found in cool, upwelling-modified waters less than about 17°C, while avoiding the coldest, most recently upwelled waters near shore. Further analyses of the CSCAPE results in the context of oceanographic processes are planned in the future, and, combined with the results of other studies in this report, will enhance our understanding of the dynamic nature of the California Current and the marine predators that inhabit this region

Throughout most of the California Current, zooplankton biomass ended the season with anomalously low values. The results of either (or both) delayed upwelling and low zooplankton biomass were reduced catches of juvenile rockfish (lowest catches in 22 years occurred during summer 2005 off central California), poor recruitment of all forage fish off Oregon and Washington (sardines, anchovies, herring, and osmeriids), wide-spread recruitment failure and deaths of seabirds off central California and Oregon, and an apparent redistribution of leatherback turtles, fur seals, and fin and blue whales. Although most of the California Current was affected by the warming, conditions off Baja California were anomalously cool and both copepod and euphausiid biomass values had strongly positive anomalies. This was true both for coastal and offshore waters. Another factor that could have contributed to the dramatic ecosystem impacts is that the northern California Current has been warmer than normal for the past three years, and may have led to chronic stress on animals.

Deployment of any WEC arrays, even the Aquabuoy by Finavera (a device 76 feet in overall height, 70' below the surface, and weighing 75 tons) will have a minimum size requirement to meet cost of production at the competitive commercial scale .

***Numerically the numbers and ocean space required for any WEC device array are staggering and together pose risks that are cumulative and increase perils and impacts to: a) Marine and estuarine flows, b) Trophic level exchange of energy in food chain, and c) Nutrient exchange density at the intertidal zone impacting the seaweeds (an added value resource of the Mendocino Coast supporting 5 local businesses and employees, gathering a nutritious food resource) from the Northern Bull Kelp to the High-tide storm fed ocean nutrient rich Nori.

Cumulative Impacts to Cetacean Migrations must include current and proposed near and offshore development. Other activities and facilities may include (not limited to)

- New energy, defense, telecommunications, MPA's, north & south shipping lanes which

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necessarily must include projected increases in traffic of barges, freighters and research/maintenance ships in support of new energy development projects on the west coast associated with LNG, and any ocean energy conversion projects.

- WEC Device field arrays lease area boundaries or any other proposed ocean WEC device/platform/arrays in the coastal waters of the Mendocino Coast.
- Since most literature on ocean WECs include discussions on desalination the potential for a return of the water privateers seems inevitable. No longer will they have to apply for instream permits. Tug boats and floating bags and barges off the coast, completely changing the ocean, and the nearshore ecosystem.

From: Hatfield Marine Science Center Oregon State University October 11-12, 2007

Compiled by Gregory McMurray

Ocean and Coastal Management Program

Oregon Department of Land Conservation and Development

Sec. 4.4 Operational Stressor Signals: page 39

Incorporated by Reference: Key references for this section are

Scottish Executive's Strategic Environmental Assessment (Faber Maunsell and METOC PLC 2007), with two supporting documents on vertebrate collisions (Wilson, et al. 2007) and acoustics (Richards, et al. 2007)

Buoy or device effects may be considered individually, but the effect of a full commercial array, up to three miles long and comprised of hundreds of buoys or other devices, may create more than an additive risk for a given stressor. Long, linear arrays may, in fact, act as barriers to certain groups of biota, depending on the signature of concern, for example, sound. The effects of the array need to be considered in the context and scale of the ecosystem component, whether it is the littoral cell, or sub-cell, in the physical process, or the life history context of migratory species such as whales, seabirds or anadromous fish. Mitigation is intended in the following section to mean minimization or avoidance of effects, not to mean ecological or monetary compensation. Mitigation may be very effective in some cases, especially through siting decisions that take into account the physical or ecological process context.

Sec. 4.4 Operational Stressor Signals: page 43-44

Mitigation for collision and entanglement can include visual cues, such as highly visible paints and acoustic "guidance" to cause animals to perceive the structures or avoid the arrays.

Known mitigation for operational noises is limited to design factors, and appropriate siting.

*******Just as Cetacean or Marine Mammal entanglement is a concern, any added acoustic disturbance is an unacceptable 'mitigation'. The relative 'quiet' of the non-industrialized and undeveloped Mendocino Coast provides a "Stressor" free zone and feeding area for the entire length of the coastline. Citing current relevant work and Incorporating by Reference the document in it's entirety where relevant:

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OCS Study MMS 2008-006 Sperm Whales Seismic Study Synthesis:

Principal Conclusions Chapter 1.4 p6

“...focus region has extensive human activity in the form of marine transportation, recreational activities, commercial and recreational fishing, oil and gas activities, and other anthropogenic disturbances. Thus the sperm whale population that was most studied during SWSS already may have been habituated to anthropogenic sounds, including those from seismic airgun arrays. SWSS data, therefore, should not be considered truly baseline in the sense of defining normal behavior of unexposed animals.”

***By definition, a new “Stressor” agent is an impact not a mitigation. Frequency and exposure would be for the duration of the test phase, construction, and WEC device arrays lifetime. Acoustic barriers may be more of a danger to Marine mammals and many other species than collision and entanglement, which are more immediate and obvious perils.

RESPONSES OF SPERM WHALES OF THE NORTHERN GULF TO ANTHROPOGENIC NOISE

Chapter 6 pps 256-259

They concluded that the data indicate a reduced foraging effort during air gun emissions. This may well be much more important in the case of the Grey whale.

From the:

Study of the Feasibility of Developing Wave Power as a Renewable Energy Resource, Hawaii
pgs 22, 23 24, 25, 26

Potential influence from low frequency sound emission and electromagnetic fields in cable is a concern. Calculations of magnetic fields from submarine cables dug down one meter under the seabed show that the magnetic field on the seabed above the cable will be smaller than the geomagnetic field. While no impacts are expected if the cables are properly buried, (the geomagnetic field is the constant DC magnetic field surrounding the earth).

***WEC devices produce AC and the transmission electro-magnetic field will be AC. What is the effectual difference to the ocean environment, & resident fish populations that use magnetic field strengths for location, i.e. anadromous species or Cetacea?

Electric and magnetic fields around the cables may influence fish and fish breeding, but no research results have yet been found published on these issues, although seabed cables have existed during the last 80 years. The cables connecting wave energy converters, substations and the grid will need to be buried to avoid potential damage, for example from anchors or fishing activity.

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While not specifically mentioned in the *Alternative Energy Programmatic EIS October 2007*
Chapter 7 ANALYSIS OF THE PROPOSED ACTION AND ITS ALTERNATIVES

Chapter 7.6.2.7 Electromagnetic Fields

The use of submarine power cables that generate EMFs is very limited in the United States; cables power some oil and gas platforms and some island communities (see Sections 4.2.7, 4.3.7, and 4.4.7). There is one cable in use that brings power from Connecticut to New York.

According to Sections 5.2.7, 5.3.7, and 5.4.7, EMFs in the vicinity of alternative energy facilities or associated submarine transmission cables would have negligible impacts on human health or aquatic species. The proposed cable systems for alternative energy facilities would be shielded to effectively block the electric field produced by the conductors. Since there are few other power cables on the ocean floor, cumulative EMF impacts from multiple facilities would be negligible (this conclusion also assumes that other cables in use would be required to have shielding, and considers that attenuation of EMFs occurs with increasing distance).

***Changes in sedimentation and turbidity of water may impact on fish and fish larvae. This is predominantly a temporary effect during construction. “For cables, some guide to the potential level of impact can be taken from the laying of natural gas pipelines. Laying of such pipelines causes a disturbance corridor of around 5 meters, with effects from suspended sediment levels affecting organisms to 50 meters away”.

***What weighted measures standards (vectors) will be employed as a baseline and visual guide in the mapping of overall ocean energetics and exchange? Thermodynamics of the sea surface are complex. There are flows inherent both into and out of the proposed project area and locale. Those flows are not only 3D mass transfers but also energy transfers along entropy gradients.

The magnitude and direction of the atmospheric and surface interaction vectors including the California Current and Food Transport depend on the position of latitude and naturally occurring thermodynamic properties of the project area. Impacts caused by the deployment of WEC device arrays will likely include a critical reduction in the amount of energy reaching the shore. Those parameters including relative entropy are difficult to measure.

***Software algorithms are usually proprietary and full transparency (regarding the appropriation of the Public Commons under a lease agreement as proposed under FERC licensing and specific to FERC Docket No. P-13053-000) is required to understand any potential of effectual changes to the ocean ecology and ocean environment.

***How will the decrease in wave energy between the WEC Device Arrays and shore affect available energy tropic layer exchange and settlement of turbidity?

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Chapter 7.1.1 Construction

All offshore construction activity will affect the transparency of water and the local bottom sediment. Drilling, trenching, pile-driving or dredging operations during foundation placement and cable-laying will lead to increased loading of suspended solids, which can affect benthic organisms. Similarly, the reinstatement of the trench around the cable or foundation base results in burial of existing habitats for a few meters either side of the structure. Benthic organisms are particularly vulnerable. Though impacts are small, bottom mounted structures tend to act as natural reefs and introduce fauna, however these artificial hard substrates may cause some changes to the biotope structure with consequences regarding benthos and subsequent food chain that are as yet unclear.

Though this argument is used often to defend WEC array geographical footprint, most WEC devices are not mounted on the ocean floor, but rather float attached to a cable

***During the disturbance phase, what will be the released carbon trade off? How will this be offset? Over what time frame? Green Wave Energy Solutions, LLC will need to weight the release of CO₂ to the atmosphere upon disturbance to be included in any subsequent RPS . Perhaps even the time of release (seasonal construction) will need to be analyzed and turbidity which may affect algae and plankton blooms having a gross negative effect on the active ocean atmosphere carbon pool and/or cycle.

***How will the release of heavy metals and toxins during disturbance be addressed? What is estimated cubic yards that would be dug from a trench how wide? How long? How Deep?

Potential heavy metals and toxins may include but not be limited to:

a) Trace Inorganic Chemical Analysis Nutrients

b) Trace Metals ("Bulk Metal")

In order to determine harbor dredging and cable trenching impacts: specifically include the following metals: mercury, lead, zinc, iron, chromium, copper, arsenic, cadmium, and nickel. In addition, analyses may be requested for cobalt and silver on a site specific basis. All of these are routinely determined by atomic absorption spectroscopy or plasma emission spectroscopy with due consideration for chemical interferences and detection limit requirements and capabilities.

c) Trace Metals (Partial Leaching)

The use of bulk metal analysis simply characterizes the metal composition of the sample, but does not differentiate the geochemical distribution within the various sediment phases with which the metals are associated. The technique of partial chemical leaching can be used to describe the geochemical phase distribution of the metal(s) and has been used to provide an estimate of the bioavailability of the metal.

d) Other Inorganic Compounds

Include cyanide analysis, other inorganic compounds (e.g., organo-leads) may be required.

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e) Trace Organic Chemical Analysis

There is an extremely large number of trace organic compounds that are of environmental concern. Many of these compounds may bioaccumulate and are suspected or known carcinogens or carcinogenic precursors.

f) PCB and Organochlorine Pesticides

PCB, BHC isomers, Chlordane (both isomers), DDD, DDT, DDE, Dieldrin, Endosulfan (isomers I, II and sulphate), Endrin, HCB, Heptachlor, Heptachlor Epoxide, Lindane and Methoxychlor.

ANALYSIS AND CUMULATIVE IMPACTS Must include overspray and atmospheric deposition of all forest herbicides sprayed in the 1960's, 1970's, 1980's, 1990's, the first decade of 2000-2010.

MRC still sprays in Mendocino County:

Forest Management and Stump-to-Forest Gate Chain-of-Custody

Certification Evaluation Report for the: Mendocino Redwood Company

Conducted under auspices of the SCS Forest Conservation Program

SCS is an FSC Accredited Certification Body *Updated: September 2006*

Glyphosate

Imazapyr

Triclopyr

Sulfometuron Meth

g) Polyaromatic Hydrocarbons (PAHs)

This is a particular sub-group of the aromatic fraction of petroleum hydrocarbons. These compounds are produced by the incomplete combustion of coal, coke, petroleum hydrocarbons and various aromatic compounds. These compounds are generally considered to be carcinogenic or carcinogenic precursors:

acenaphthylene benzo (a) anthracene benzo (b) fluoranthene benzo (ghi) perylene chrysene fluorene indeno (1,2,3,cd) pyrene pyrene anthracene acenaphthene benzo (a) pyrene benzo (e) pyrene benzo (k) fluoranthene dibenz (ah) anthracene fluoranthene naphthalene phenanthrene

h) The LP Mill site South of the Noyo, the GP Mill Site (Fort Bragg) including all previous ownerships) have left a trail of toxins, residues, solvents, petrochemicals and paints that may have leached into the ocean and are now offshore under the benthic layer.

l) Miscellaneous Analyses

Analyses for chemical determinations (metals, nutrients, organics) should be made using a method that achieves the smallest, most accurate detection unit/limit.

Despite the claim that Wave Energy is a renewable energy the actual savings in emissions depends to a large extent on the mix of types of power generation for an individual country or region and the type of plant replaced. Any calculations on emissions savings must look realistically at the type of power generation likely to be replaced, and not just assume that the most polluting will be shut down.

Emissions associated with the manufacture of materials and components are dependent on

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industrial practices, the generation mix and pollution control regime in the country of manufacture. Given these parameters, Green Wave Energy Solutions, LLC has many studies to complete without ever getting in the water. Green Wave Energy Solutions, LLC, with complete transparency, must show in good faith, a chart/graph and text description of its renewable energy device carbon footprint.

Despite the claim that Wave Energy is a renewable energy that produces no greenhouse gases or other atmospheric pollutants while generating electricity, and that environmental benefits will arise from the avoidance of typical electrical generation pollutant gasses (including GHG), there is no foreseeable plan for reduction of use or preservation of raw materials like oil, uranium and coal. The actual saving in emissions and conservation/use of raw materials will depend on the ability of a particular WEC device to deliver energy to market, and on the type of energy that is replaced by wave energy.

The Energy Information Administration (EIA), a component of the U.S. Department of Energy (USDOE), issues an Annual Energy Outlook each year. In *Annual Energy Outlook 2006 with Projections to 2030* (EIA 2006), the EIA projects that new electrical generating capacity will include a mix of generating technologies. Of the new generating capacity to be added over the period 2004 to 2030, coal-fired plants are projected to account for 50%, natural gas-fired plants 40%, renewable technologies (primarily wind, biomass, and geothermal) 8%, and nuclear 2%. New 'clean coal' plants will add another 7% by 2030.

For wave energy technologies, the typical stages of the life cycle are:

- Resource extraction;
- Resource transportation;
- Materials processing;
- Component manufacture;
- Component transportation;
- Plant construction;
- Plant operation;
- Maintenance;
- Decommissioning;
- Product disposal.

***Ideally, each of the life cycle stages listed above should be considered, in order to evaluate the total emissions from the life cycle of the technology.

Electric Power Research Institute, an industry-supported think tank based in Palo Alto, California, judged the Pelamis one of the wave-energy systems advanced enough for use in trials scheduled for the waters of California. One can only imagine the sight—40 red serpents undulating in the sea, churning out 12 megawatts of power. Ocean Power Technologies (now Pelamis Wave Power Ltd. September 2007) engineers say that 40 sea snakes spread across 250 acres would supply enough electricity to feed as many as 20,000 households. *Current*

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production machines are 140m long and 3.5m in diameter, 750 tons, with 3 power conversion modules per machine - (attenuators) states the MMS White Paper on WAVE Energy Potential On The US OCS. Each machine is rated at 750kW. The energy produced by Pelamis is dependent upon the conditions of the installation site. Depending on the wave resource, machines will on average produce 25-40% of the full rated output over the course of a year. "The EPRI wave energy feasibility demonstration project has selected the Pelamis as one of the technologies for design, performance, cost, and economic assessment (Bedard et al. 2005). Sites for evaluation were selected off the coasts of Hawaii (15.2 kW/m average annual wave energy), Oregon (21.2 kW/m), California (11.2 kW/m), Massachusetts (13.8 kW/m), and Maine (4.9 kW/m)".

From the: Alternative Energy Programmatic EIS October 2007

Chapter 7 ANALYSIS OF THE PROPOSED ACTION AND ITS ALTERNATIVES

Chapter 7.1.2 Alternate Use of Oil and Gas Platforms

Impacts from alternate use of existing oil and gas platforms include fisheries enhancement and economic benefits to both platform operators and government agencies involved in natural resource protection. Platform removal is costly. Removal costs can be reduced by finding alternate uses for platforms. As discussed in Chapter 6, removal of a platform structure from the OCS would result in destruction of the ecological system developed around the invertebrate species and plant life that envelop a platform's structure after emplacement. This ecological system includes smaller fish feeding on plant life up to other marine life, including mammals and predator fish feeding off the smaller fish species, resulting in enhanced recreational and commercial fishing opportunities. With proper implementation, alternate uses of oil and gas platforms are expected to result in negligible to minor impacts.

*******Decommissioning and/or complete removal of all WEC devices and any and all pertinent infrastructure from the ocean as was discussed **01/19/08** meeting called WAVEConnect in Fort Bragg is of special concern and non-negotiable.

As shown also in a letter to CPUC: September 11, 1998

Bruce Kaneshiro CPUC EIR Project Manager

c/o Environmental Science Associates

225 Bush Street, Suite 1700

San Francisco, CA 94184-4207

Re: Proposed Divestiture of Electric Generation Assets by Pacific Gas and Electric
Company Application No. 98-01-008

Dear Mr. Kaneshiro:

On behalf of the seven thousand Sierra Club members of the Redwood Chapter, we are commenting on the Draft Environmental Impact Report for the Divestiture of PG&E's 14 Power Plants at The Geysers.

Decommissioning cannot be dependent upon the absence of an approved alternate use, OCS oil and gas facilities would have to at least comply with the existing requirements under 30

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CFR 250, Subpart Q, Decommissioning Activities.

PG&E put their Geysers Plants up for sale due to deregulation thus passing on unaccountability and the toxics left behind.

...13) On pg. 2-6 the sale of the power plants is to occur under the following terms and conditions, "The Geysers Power Plant will be offered for sale through a competitive bidding process to buyers who are qualified to ensure that the plant operates when needed for system reliability, and, when no longer needed, to conduct any required decommissioning in a responsible manner."

*****FERC** will need to outline specific qualifications by which such actions are to be ensured. What are the specific study tasks that they will conduct in order to decommission in a responsible manner? Decommissioning may include storm debris, sunken WEC devices and arrays, Cetacean entanglement, increased predator access to migrating Cetacea as these species and their young on their journeys will be pushed further out to the open ocean.

Financial impacts on the environment are significant because of the potential that bankruptcy and insufficient bonds will result in an inability to clean up the environment. If a single owner, such as a steam field leaseholder, purchases a plant, then their capital is sunk deeper into the same potentially insolvent generation unit. Please see the results of the Geo Operator Corporation bankruptcy that resulted in 24 leaking wells in 1997 in Sonoma and Mendocino Counties. Geo's bonds were inadequate and could only address one well head in Mendocino, leaving the remaining 23 wells to be repaired with County and State funds of over \$2 million. The wells had to be replugged because of leaking hydrogen sulfide killing any living thing within hundreds of yards. (4/11/97 Final Report on GEO Abandonment filed with Sonoma County Planning Dept. and available in local libraries.)

Steps should be included that would require a bonding requirement of any facilities by new owners to a level that would ensure that decommission and habitat restoration is done correctly and completely. This should be extended to address all directly related environmental damage. In addition, sufficient funds should be collected from plant operators to provide for inspections and monitoring by an independent party responsible to the public.

Incorporated by reference again as substantive argument for parallel consideration in the FERC permit application process ...

Sierra Club to Bruce Kaneshiro CPUC EIR Project Manager

...3) The DEIR's alternatives analysis must consider decommissioning of the project plant(s) as one of the reasonable and feasible alternatives. (Id., 15126(d).) One reason alone would be the effect of Proposition 9. According to the Analysis of the California Energy Commission's "Preliminary Analysis of the Utility Rate Reduction and Reform Act", rate levels for residential customers of PG&E would plunge 26 percent starting in January, 1999. PG&E would be impacted due to a \$2.9 billion debt for the Diablo Canyon plant in addition to The Geysers plants, including debts for Units 21, 22, 23 and 24 which were never built. Another reason you give on pg 3-7 is that "PG&E would not be required to sell its plants, and it is not certain that

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the plants would be sold" thus leaving it open ended to financial decisions to decommission.

Biocides, evasion technologies and fouling: The subject of marine growth is an important area both regarding marine growth inside the turbines and regarding marine growth in general. The systems will have to be treated and maintained in order to avoid the expected reduced efficiency over time. Evasion technologies, which are available e.g. within the ship industry, must be neutral to environment (marine fauna and flora, quality of water) according to the International Convention on the Control of Harmful Anti-Fouling Systems, developed by IMO's (International Maritime Organization's) Marine Environment Committee. As offshore oil and gas installations provide attachment surfaces for a variety of algae and invertebrates, so wave energy converters would be colonized by fouling organisms. The species recruited to these sites would depend on the species communities within the vicinity of the device, distance offshore, water depth and clarity, prevailing weather conditions and position relative to coastal currents and the speed of those currents. There would be a seasonal factor involved in the build up of this community. It is inevitable that anti-fouling measures would be necessary where, for instance, attached organisms cause changes in corrosion and fatigue behavior, hinder inspection and maintenance, etc. Fouling prevention measures specific to wave energy converters have yet to be developed, but could include the use of anti-fouling paints or direct injection of biocides. Fouling of sea water conduits at coastal power stations has been controlled by injection or electrolytic generation of chlorine. Certainly chronic impacts may result if the chlorine was allowed to react to form chlorinated organics which tend to bioaccumulate and persist in the environment.

***What controls beyond Manufacturers MSDS and Application Data Sheets will be employed to insure ocean water quality standards are not impacted the slightest, nor the overall ecological balance in the coastal waters?

ADVOCATE FOR WILD FREE HEALTHY OCEANS SUPPORT RECOVERY OF FISH STOCKS AND OPEN OCEAN WATERS

Incorporated by reference is Richard Charter's presentation at the 01/19/08 Fort Bragg WAVEConnect forum.

Richard Charter, National Outer Continental Shelf Coalition (*Community & Fishing Issues Panel*)

Richard Charter has been working for nearly three decades to ensure continued protection for sensitive coastlines threatened by offshore oil and gas drilling.

In the DVD* version of his presentation (available at Fort Bragg City Clerk) Richard Charter mentions that it is not so much that WAVE Energy Farms may obstruct the **California Current**, but that they will obstruct the **food transport** of nutrients south along California's shores and the impacts are unknown. **Upwelling centers** comprise 2% of the ocean but supply 50% of the world's fish catch.

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In upwelling, the **nutrients** come up from the depths driven by the winds to the surface and then move south along our coast. This upwelling (rises up on the western shore from Fort Bragg to Pt. Arena) provides nutrients that feed the entire marine ecosystem from Fort Bragg to the northern rim of Monterey Bay.

***Where will the fisher people fish?

***How much is the added-value of renewable food supplies worth? John Innes at 01/19/08 forum estimated values by user days and catch. Salmon season and bottom fishing are worth (\$50 million, 480 jobs) just offshore from the "GP mill" in Fort Bragg. Boats fish southward off the shores and bluffs of the whole county coastline and can be seen from Mendocino Village throughout the seasons.

Saltwater fishing for the State of California: 435,000 angler spent 5,650,000 days fishing in the ocean, and in our area 30,573 recreational angler trips, and 18,000 party boat trips.

Another valuable renewable food resource that has been harvested commercially locally are seaweeds. For over 30 years local companies have sustainably harvested seaweeds at the intertidal zone on the rocks. Culturally the Pomo have harvested for centuries the seaweeds as a food resource. The tonnage that is removed every year and grows back each year is a phenomena in itself. High quality, nutrient rich, and clean. It is all harvested by hand and 4 local companies employ many people. The seaweeds are sold in major health food store chains, and independent grocery stores and large supermarkets, small retail venues, farmers markets, spas, and through Internet sales.

One particular seaweed, the Sea Palm, grows nowhere else in the world. Also there are species of Nori, Turkish Towel, Bull Whip Kelp, Wakame, Ocean Ribbons, Kombu, Fucus.

Incorporated by Reference is the entire article "Seaweed, Iodine, and Women's Breast Health" -- copyright 2008 by John Stephens-Lewallen, Mendocino Sea Vegetable Co.

"The most significant evolutionary event in eukaryote (nucleated cells organisms), including humans, occurred when seaweeds concentrated iodine. From this process came multicellular organisms, vertebrates, and humans." David M. Derry, Breast Cancer and Iodine (2001, published by www.trafford.com, 108 pages with peer-reviewed scientific footnotes)

Many customers for dried wild-crafted sea vegetables now are people who regularly eat seaweed to make sure they are getting a sufficient supply of iodine in their diet for optimum health. Iodine is an essential trace element, meaning that human beings need iodine to survive, and people must constantly take up new iodine, because iodine is relentlessly excreted through the urinary tract. Every cell of a human in optimal health contains iodine, though people can live and function with very small levels of iodine in their bodies.

Iodine, discovered in 1811 by a man applying acid to seaweed to make gunpowder, remains an

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indigo mystery to the human race. A rare element, iodine is concentrated almost nowhere on Earth except in marine algae (multi-cellular seaweed). Iodine kills most single-celled organisms, but is spread thinly enough in the world's oceans to allow proliferation of single-celled creatures. Most single-celled organisms have the two amino acids tyrosine and histidine exposed to the environment; iodine combines with these same two amino acids and kills the organism.

Every cell in marine algae (seaweed), believed by current science to be the first multi-celled life on Earth, has a receptor which concentrates iodine from sea water. Today, as then, the world's leading means for concentrating iodine is seaweed. Iodine is in every cell of the healthy human body, and nobody knows what it is doing there. Many physicians have iodine theories; some doctors voice firm "scientific beliefs," having no foundation in, and often contradicted by, controlled, peer-reviewed scientific experiments.

Thus, according to Donald W. Miller, Jr., in his article "Iodine for Health" posted on www.LewRockwell.com, establishment medicine; the American Medical Association, World Health Organization, etc. firmly believe that 100-150 micro-grams a day of iodine will meet the requirements of 98 per cent of healthy people. "An intake of 150 micro-grams a day of iodine will prevent goiters and the other recognized iodine deficiency disorders, but not breast disease," according to Dr. Miller, a surgeon and Professor of Surgery at University of Seattle. "Prevention of breast disease requires higher doses of iodine. Indeed, a reasonable hypothesis is that, like goiters and cretinism, fibrocystic disease of the breast and breast cancer are iodine deficiency disorders (also uterine fibroids)."

All doctors agree that iodine is essential for the thyroid gland, which regulates the whole body. Extreme iodine deficiency is known by all to cause goiter, a swelling of the thyroid gland, and cretinism, a birth defect. "Expert opinion on iodine is now the purview of thyroidologists," laments Dr. Miller. "Mainstream physicians and surgeons accept their thyroid-only view of iodine and either ignore or discount studies that show iodine in larger amounts provides extrathyroidal benefits, particularly for women's breasts."

Seaweed, Iodine and Cancer Rates in Japan and the United States

In Japan almost everybody eats a lot of seaweed every day. In 1964 a study found mainland Japanese eating an average of 4.5 grams of seaweed per day, or about one-sixth of an ounce of sea vegetables. This delivered them 13.8 milligrams of iodine per day, near the 12.5 milligrams daily recommended by Dr. Miller, whose article "Iodine for Health" is source of this comparison of two nations and iodine.

In the United States, except for a minority consisting primarily of Americans of Japanese, Chinese and Korean ancestry, along with health food advocates and therapeutic users, most people eat no sea vegetables (seaweed). The daily U.S. intake of 240 micro-grams of iodine a day is about one-fiftieth of the iodine Japanese were getting daily in 1964. Today, the Japanese have expanded their seaweed farming industry, and a more recent study

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found the seaweed-loving mainland Japanese eating 14.5 grams (about a half-ounce) of seaweed daily, giving them a full 45 milligrams of high-quality organic iodine.

There is good reason to believe modern Americans need a constant flood of high-quality iodine in their diets. The cellular uptake of iodine is blocked by the other halides, fluoride and bromide, which are increasingly eaten and absorbed from the environment. These halides can be cleared from the body by large doses of iodine. A nutrition brief by U.C. Davis cited a study which found perchlorate, a contaminant of vegetables from California, in the breast milk of all mothers examined in several states. Perchlorate prevents iodide from binding to the thyroid hormones.

Doctors Derry and Miller note that iodine consumption has declined radically in the United States. Iodized salt, which is the chief iodine source in the U.S., is eaten by only 45% of the population. Low-sodium diets and fast foods containing iodine-free salts are two factors in this decline. Also, until 1980 iodine was used as a dough conditioner for making bread; now bromine is used, a halide which blocks iodine uptake in the body. The traces of iodine in much farm soil have been exhausted, and radioactive iodine is a widespread environmental contaminant.

Sea vegetables (seaweed) is the only food on Earth which can deliver 13 milligrams of iodine daily to a person. Using the Japanese measurements of the average iodine content in about one-sixth of an ounce of dried sea vegetables--13.8 milligrams--a person would have to eat about 25 pounds of fish, the leading non-seaweed food source of iodine, to get that much iodine. Land vegetables contain but micro-gram traces of iodine, and dairy products may be contaminated by the radioactive iodine taken up by cattle from atmospheric pollution falling on grass.

Most strikingly, while the popular red seaweed *Porphyra* (Nori) has 0.5 milligrams, or 500 micro-grams, of iodine per gram of weight, *Laminaria*, or Kombu, ranges from 193-471 milligrams of iodine per gram! "The Chinese for centuries have treated goiter, caused by an iodine deficiency by means of iodine obtained from Kombu (*Laminaria*) harvested from the waters around Japan, especially the vicinity of the northern island of Hokkaido. Brown algae are very high in iodine content," the Arasakis wrote on page 46 of their book. *Undaria pinnatifida*, Wakame, a brown seaweed similar to Mendocino Wakame, tested between 18 and 35 milligrams of iodine per gram.

At the Mendocino Sea Vegetable Company, Barbara and I strive to harvest the best-quality seaweed at its prime, and sun-dry it quickly and completely. We offer our Pacific harvest, Mendocino Kombu (*Laminaria setchelli*), as a gourmet food whole and flaked, and wildcrafted North Atlantic *Laminarias* of two species flaked and powdered.

Mendocino Seaweed Miracle Mix is a milled blend of the four leading Mendocino Sea Vegetables: Nori, Wakame, Kombu, and Sea Palm Fronds. A lot of our customers use the

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Miracle Mix regularly, hungry for the mysterious element iodine that it contains, and for the many other essential trace elements in wild-crafted sea vegetables.

-- copyright 2008 by John Stephens-Lewallen, Mendocino Sea Vegetable Co.

***A reduction in wave heights at or near shore would impact nearly all seaweed species on the Mendocino coast, and permitted test sized arrays will likely not cause this effect. Commercial scale operational arrays and parks may and there can be no mitigation.

Status of Seaweed Harvest:

Seaweeds are produced through gathering and/or harvesting of natural stocks and through certain culture techniques (Sinha 1992). Over the last three decades especially in Asia and the Western Pacific region, the commercial farming of several important seaweed species has gained momentum and it is expected that their production in Asia and the Pacific will continue to change from a total dependence on harvesting natural stocks of commercially important species to the more controlled methods of production by cultivation (Trono 1986).

Presently, commercial production of seaweeds through culture is by and large limited to Japan, China, Republic of Korea, Taiwan (Province of China) and the Philippines. However, reports of seaweed culture are available from many Asian countries (such as India, Indonesia, Sri Lanka, Myanmar and Vietnam) but their production is not in bulk and does not constitute any significant component of world market.

Thus, significant increase in the production of the seaweed reflects the growing importance of seaweeds as marine biological resources, not only as an important primary producers in the shallow-water marine ecosystem, but are directly utilized as human food, as components of animal feeds and as organic fertilizer. Biological products derived from them, such as agars, alginates, furcellaran and carrageenans, have and will continue to have diverse applications in the food, chemical, pharmaceutical and other industries (Trono 1986).

*From Ocean Harvest Sea Vegetable Company
Mendocino, CA 95460*

Seaweed on the Mendocino Coast is an indigenous plant. There are also particular types of seaweeds found only in the world on the Northern California coast line up into Southern Oregon. Two known rare seaweeds are Sea Palm and Sweet Kombu. Sea Palm is only found in large enough quantities on the Mendocino coast to be one of the seaweeds which make a small cottage industry possible.

Reduction in the arrival of nutrients onshore and fluctuating wave heights from a wave energy farm, bring up the possibilities of exposing the seaweeds to a habitat lacking the necessary nutrients and an overabundance of sunlight. Both nutrients and the balance of sun and water are needed to sustain the indigenous seaweed beds.

As part of a county wide nutrition education program, students throughout Mendocino

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County have been exposed to the values of eating and harvesting wild seaweeds. This is a wild food that is available (up to 10 lbs. wet) to the people of Mendocino County for the cost of a fishing license. Food insecurity is over 30% in Mendocino County, so all food sources are important for sustaining health.

***Ocean Harvest Sea Vegetable Collective has been sustainably harvesting wild seaweed beds for the past 29 years. It is my belief that any proposed wave energy park would detrimentally effect wild seaweed on the Mendocino coast.

Terry Nieves
for Ocean Harvest
Sea Vegetable Company
PO Box 1719
Mendocino, CA 95460
ohveggies@pacific.net
www.ohsv.net

Respectfully submitted,

02/09/09

Tomas DiFiore
POB 612 Little River, Ca 95456
707-937-4378
iamtomas@mcn.org

Business:
Astral-Arts Mendocino
yonectar@mcn.org

Comments and questions regarding FERC Docket No. P-13053-000 and Intervenor status are as follows:

***Under all applicable State and Federal laws regarding landscape dynamics and rights of exploitation, any litigation involves the complete Public Record of Comment. As the Intervenor category suggests litigation on appeal, would an Intervenor presenting litigation then have legal access and use of the entire record of comment or just those filed in the name of said Intervenor?