APPENDIX C
NOTICE OF PREPARATION AND COMMENT LETTERS

ERIC GIBSON
DIRECTOR

County of San Diego

DEPARTMENT OF PLANNING AND LAND USE

5201 RUFFIN ROAD, SUITE B, SAN DIEGO, CALIFORNIA 92123-1666
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NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

September 9, 2010

NOTICE IS HEREBY GIVEN that the County of San Diego, Department of Planning and Land Use will be the Lead Agency and will prepare an Environmental Impact Report in accordance with the California Environmental Quality Act for the following projects. The Department is seeking public and agency input on the scope and content of the environmental information to be contained in the Environmental Impact Report. A Notice of Preparation document, which contains a description of the probable environmental effects of the project, can be reviewed on the World Wide Web at **http://www.sdcounty.ca.gov/dplu/ceqa_public_review.html**, at the Department of Planning and Land Use (DPLU), Project Processing Counter, 5201 Ruffin Road, Suite B, San Diego, California 92123 and at the public libraries listed below. Comments on the Notice of Preparation document must be sent to the DPLU address listed above and should reference the project number and name.

POD 10-007, WIND ENERGY ORDINANCE. The project proposes amendments to the County of San Diego Zoning Ordinance for wind energy systems. The amendments consist of clarifications, deletions, and revisions to provide an updated set of definitions, procedures, and standards for review and permitting of wind energy systems. The proposed project includes the allowance of small wind energy systems that meet the definition of the Zoning Ordinance by right; and large turbines will be required to complete a separate environmental review process per the Major Use Permit procedures and requirements.

The project is located within the County of San Diego which is in Southern California bordered to the west by the Pacific Ocean, to the east by Imperial County, to the north by Orange and Riverside Counties, and to the south by Mexico. The project covers the unincorporated portions of the County of San Diego over which the County has land use jurisdiction. Comments on this Notice of Preparation document must be received no later than **October 11, 2010 at 4:00 p.m.** (a 30 day public review period). This Notice of Preparation can also be reviewed at the following libraries: 4S Ranch, Alpine, Bonita, Borrego Springs, Campo, Casa de Oro, Crest, Descanso, Jacumba, Julian, Lakeside, Pine Valley, Potrero, Ramona, Rancho San Diego, Rancho Santa Fe, Spring Valley and Valley Center. In addition, a public scoping meeting for this project will be held at 6:00 p.m. on September 21, 2010 in the DPLU Hearing Room at 5201 Ruffin Road, Suite B, San Diego, California 92123. For additional information, please contact Matt Schneider at (858) 694-3714 or by e-mail at matthew.schneider@sdcounty.ca.gov.

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DIRECTOR

County of San Diego

DEPARTMENT OF PLANNING AND LAND USE

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NOTICE OF PREPARATION DOCUMENTATION

DATE: SEPTEMBER 9, 2010

PROJECT NAME: WIND ENERGY ORDINANCE

PROJECT NUMBER(S): POD 10-007

PROJECT APPLICANT: County of San Diego

ENV. REVIEW NUMBER: N/A

PROJECT DESCRIPTION:

The project proposes amendments to the County of San Diego Zoning Ordinance for wind energy systems. The amendments consist of clarifications, deletions, and revisions to provide an updated set of definitions, procedures, and standards for review and permitting of wind energy systems.

Background: The following is a brief history of amendments made to the County Zoning Ordinance related to wind energy systems:

On October 10, 1985, the County of San Diego adopted Ordinance 6857, which included an amendment to the Zoning Ordinance to add the definition for wind energy systems. The definition was later amended by Ordinance 9971, adopted February 25, 2009, in order to clearly separate the definitions of a Metrological Testing (MET) Facility and a wind energy system.

On April 23, 1986, the County of San Diego adopted Ordinance 7117, which amended the Zoning Ordinance to add definitions for Small, Medium, Large, and Non-operational wind energy systems. The ordinance also added procedures and standards for review and permitting of these systems.

On February 25, 2009, the Board of Supervisors held a meeting to discuss additional amendments to the Zoning Ordinance to revise the existing Small, Medium, and Large wind energy system definitions and regulations. A portion of these proposed amendments was to remove references to California Assembly Bill (AB) 1207, which was repealed in 2006. This portion was circulated for public review in March 2010 as a part of POD 09-006, the Solar and Wind Energy Ordinance. Another portion of these proposed amendments was to allow for additional small-sized wind energy systems with an Administrative Permit under the Medium wind energy system provisions with required findings and the existing size limitations in place. This portion was moved to a separate ordinance, POD 10-007, and was circulated for public review in June 2010. The remaining portion of the proposed amendments related to wind energy systems included more substantial changes to the regulations and required further environmental review. This portion, in addition to the removal of references to California Assembly Bill (AB) 1207 constitutes the proposed project. The summary below provides further details regarding the project.

Description: The project consists of the following amendments to the San Diego County Zoning Ordinance:

- Update of regulations for Small and Large Wind Energy Systems and removal of the former Medium Wind Energy System section.

- The creation of a new Renewable Energy section of the Zoning Ordinance consisting of wind energy systems.

- As previously required, large-scale wind power plants would continue to require a Major Use Permit in order to review such projects on a case-by-case basis and address project-specific impacts.

The amendments are intended to set forth reasonable standards and procedures for the installation and operation of wind energy systems to improve and enhance public welfare and safety, and to implement the San Diego County General Plan, specifically the Energy Element (adopted November 15, 1977).

Steps are being taken at both the state and federal levels to increase renewable energy production. At the state level, California's Renewable Portfolio Standard (RPS) program requires obligated load-serving entities (LSE), including San Diego Gas & Electric (SDG&E), to procure an additional minimum of 1 percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. Executive Order S-3-05 (June 2005) identified greenhouse gas (GHG) emission-reduction targets for the state, providing the impetus for a potential expansion of the RPS program to include a goal of 33 percent renewable energy by 2020. Additionally, the California Air Resources Board (ARB) issued the draft Climate Change Scoping Plan in June 2008, and a key

component of achieving the GHG targets is that California codify into statute and achieve a 33 percent RPS by 2020.

According to California's RPS compliance filings, SDG&E's actual renewable power procurement percentage is 10.2 (SDG&E 2010). The proposed project is an important element in developing additional renewable energy resources required to meet the current and future California RPS and federal Energy Policy Act goals for developing renewable energy. With the advent of new technology, wind energy has become a viable renewable resource. The State has also adopted legislation (AB 45, October11, 2009) to encourage the use of small wind systems and limit obstacles to their use.

The affected sections of the Zoning Ordinance are as follows:

- Section 1110: would add definitions for wind energy system Height and wind energy system Tower Height; revise definitions of wind energy system small, wind energy system large, and wind energy system non-operational; and remove wind energy system medium.

- Section 6123: would clarify a MET Facility of less than the height of the zone is allowed without the requirement for an Administrative Permit.

- Section 6156.z: would move wind energy system small regulations to new Section 6950.

- Section 6158.b: would move wind energy system small regulations to new Section 6950.

- Section 6950 and 6951: would remove wind energy system medium regulations, insert new wind energy system small section, and revise wind energy system large section.

As outlined below, the proposed project includes the allowance of small wind energy systems that meet the definition of the Zoning Ordinance by right; and large turbines will be required to complete a separate environmental review process per the Major Use Permit procedures and requirements.

Environmental Review: The project includes both small wind energy systems and large wind energy systems, which are subject to different environmental review processes by the County. An overview of the different environmental processes for small vs. large wind energy systems is provided below:

Small Wind Energy System: A small wind energy system is defined as a wind turbine energy conversion system, with or without a tower, which has a rated capacity of not more than 50 kilowatts for each system and is consistent with the requirements of Zoning Ordinance Sections 6156 and 6951 and used primarily

for on-site energy use. These systems shall be permitted as an accessory use in all zones where the Civic, Commercial, Industrial or Extractive use types are allowed provided the system complies with the Renewable Energy Regulations commencing at Zoning Ordinance Section 6950. The Program Environmental Impact Report (PEIR) will include environmental review for small wind energy system projects, which meet the definition as stated previously.

Under the proposed project, a small wind energy system is allowed by right if the future proposed wind energy system meets the definition and all requirements listed in the Zoning Ordinance Section 6951. If a future small wind energy system meets the definition and all requirements listed in the Ordinance Section 6951, then the small wind energy system does not require any discretionary permits or public notice. In the event a future small wind energy system does not meet one or more of the requirements under Ordinance Section 6951, then a variance is required. In the event a variance is required, a future project is required to provide public notice and the local Community Planning Group where the project is being proposed will be provided the opportunity to review. The final decision on whether a variance will be granted will be based on a determination made by the Director of Planning and Land Use.

In the event a small wind energy system meets all the requirements in the Zoning Ordinance Section 6951 but includes more than three turbines, issuance of an Administrative Permit will be required. An Administrative Permit requires public notice, and the local Community Planning Group where the project is being proposed will be provided the opportunity to review. The final decision on whether an Administrative Permit will be granted will be based on a determination made by the Director of Planning and Land Use and may be appealed to the Planning Commission. In some cases, where a project is proposed in certain zoning designations such as a “B” designator or a Specific Plan area, a Site Plan will be required. This discretionary action will be subject to CEQA review.

Large Wind Energy System: A large wind energy system is defined as a wind turbine energy conversion system, with or without a tower, which has a rated capacity of more than 50 kilowatts for each system and is consistent with the requirements of Zoning Ordinance Section 6951 for off-site or on-site energy use. Large wind energy systems would continue to require a Major Use Permit and additional environmental review will be required for each project proposed. A project applicant that proposes to construct a large wind energy system will be required to complete the necessary forms and procedures for a Major Use Permit consistent with County processing requirements. As part of a Major Use Permit application, the project applicant will be required to complete an Application for an Environmental Initial Study (AEIS). The AEIS application submittal is utilized by the County to determine the appropriate California Environmental Quality Act (CEQA) document (i.e., Negative Declaration or EIR) that will be required in order to complete an environmental review. Since each future large wind energy

system application will be required to obtain a Major Use permit and complete a separate environmental review process, the County has determined that the PEIR being prepared for the proposed wind ordinance will not evaluate the potential environmental impacts associated with a large wind energy system. Large wind energy systems will be evaluated under CEQA during project processing of each Major Use Permit application.

PROJECT LOCATION:

The project is located within the County of San Diego which is in Southern California bordered to the west by the Pacific Ocean, to the east by Imperial County, to the north by Orange and Riverside Counties, and to the south by Mexico. The project covers the unincorporated portions of the County of San Diego over which the County has land use jurisdiction.

PROBABLE ENVIRONMENTAL EFFECTS:

The probable environmental effects associated with the project are detailed in the attached Environmental Initial Study. All questions answered "Potentially Significant Impact" will be analyzed further in the Environmental Impact Report. All questions answered "Less than Significant Impact" or "Not Applicable" will not be analyzed further in the Environmental Impact Report.

The following is a list of the subject areas to be analyzed in the EIR and the particular issues of concern:

Aesthetics
Agricultural Resources
Biological Resources
Cultural Resources
Hazards
Noise

PUBLIC SCOPING MEETING: Consistent with Section 21083.9 of the CEQA Statutes, a public scoping meeting will be held to solicit comments on the PEIR. This meeting will be held on Tuesday, September 21, 2010 in the County of San Diego Department of Planning and Land Use Hearing Room at 5201 Ruffin Road, Suite B, San Diego, California 92123 at 6:00 p.m.

Attachments:

Environmental Initial Study

LIST OF PERSONS, ORGANIZATIONS, AND PUBLIC AGENCIES THAT COMMENTED ON THE NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE WIND ENERGY ORDINANCE AMENDMENT POD 10-007

Public Review Period: September 9, 2010 through October 11, 2010

The following is a listing of the names and addresses of persons, organizations, and public agencies that commented during this public review period.

	NAME	DATE	ADDRESS
	STATE AGENCIES		
1	State of California, Department of Fish and Game	13-Oct-10	Edmund Pert South Coast Region 4949 Viewridge Avenue San Diego, CA 92123
2	State of California, Department of Forestry and Fire Protection	30-Sep-10	Mark Ostrander CAL FIRE San Diego Unit P.O. Box 1560 Boulevard, CA 91950
3	State of California, Governor's Office of Planning and Research	15-Sep-10	Scott Morgan P.O. Box 3044 Sacramento, CA 95813
4	State of California, Native American Heritage Commission	16-Sep-10	915 Capital Mall, Room 364 Sacramento, CA 95814
	COUNTY, CITY AND OTHER LOCAL AGENCIES		
5	San Diego County Archaeological Society, Inc.	20-Sep-10	James W. Royle, Jr. Environmental Review Committee P.O. Box 81106 San Diego, CA 92138-1106
	PLANNING GROUPS		
6	Backcountry Against Dumps	11-Oct-10	Donna Tisdale Backcountry Against Dumps P.O. Box 1275 Boulevard, CA 91905 donnatisdale@hughes.net
7	Boulevard Community Planning Group	11-Oct-10	Donna Tisdale Boulevard Planning Group P.O. Box 1272 Boulevard, CA 91905 donnatisdale@hughes.net

	LOCAL ORGANIZATIONS		
8	Endangered Habitats League	29-Sep-10	Dan Silver Endangered Habitats League 8424 Santa Monica Blvd, Suite A 592 Los Angeles, CA 90069-4267 dsilver@me.com
9	Stephan C. Volker, Law Offices on behalf of Backcountry Against Dumps, the Protect Our Communities Foundation and East County Community Action Coalition	11-Oct-10	Stephen C. Volker 436 14th Street, Suite 1300 Oakland, CA 94612
10	Stephan C. Volker, Law Offices on behalf of Backcountry Against Dumps, the Protect Our Communities Foundation and East County Community Action Coalition	24-Nov-10	Stephen C. Volker 436 14th Street, Suite 1300 Oakland, CA 94612
	INDIVIDUALS		
11	Padoma Wind Power, LLC, a subsidiary of Enel North America, Inc	15-Oct-10	Jennifer Purczynski 7777 Fay Avenue, Suite 200 La Jolla, CA 92037
12	Prodigeo Corp.	8-Nov-10	Address not provided.

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME

ARNOLD SCHWARZENEGGER, Governor
JOHN McCAMMAN, Director

South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201
http://www.dfg.ca.gov

October 13, 2010

Matthew Schneider
County of San Diego
Department of Planning and Land Use
5201 Ruffin Road
San Diego Ca 92123
(858) 694-3714
email: matthew.Schneider @sdcounty.ca.gov

Subject: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006, LOG NO. 09-00-003), San Diego County (SCH#2010091030).

Dear Mr. Schneider:

The Department of Fish and Game (Department) has reviewed the Notice of Preparation (NOP) for a Draft Environmental Impact Report (DEIR), dated September 9, 2010. The public comment period closes October 12, 2010. The purpose of the proposed amendment to the Zoning Ordinance for Wind Energy Systems is to provide new and revised definitions to wind regulations. The proposed Amendment would allow small wind energy systems that meet the definition of the Zoning Ordinance. Large wind systems would be required to complete additional environmental review and obtain a Major Use Permit. The specific sections of the Zoning Ordinance that would be amended include, Sections 1110, 6123, 6156.z, 6158.b, 6950, 6951 and 6952. The proposed Zoning Ordinance would apply to the unincorporated portions of the County of San Diego.

Previous Department Comments: The Department provided comments to the County on March 26, 2010 to Solar Wind Energy Zoning Ordinance Amendment (POD 09-006, LOG NO. 09-00-003) (SCH#2010021070). The following comments are revisions to our previous comments based on changes made to the proposed Ordinance.

Department Jurisdiction: The following statements and comments have been prepared pursuant to the Department's authority as Trustee Agency with jurisdiction over natural resources affected by the project (CEQA Guidelines Section 15386) and pursuant to our authority as a Responsible Agency under CEQA Guidelines Section 15381 over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code Section 2050 et seq.) and Fish and Game Code Section 1600 et seq. The Department also administers the Natural Community Conservation Planning Program (NCCP). The County of San Diego (County) participates in the NCCP program by implementing its approved Multiple Species Conservation Program (MSCP) Subarea Plan. The County is also working towards an approved North County MSCP and Implementing Agreement under the NCCP Program and has conducted preliminary habitat evaluation for the draft East County MSCP Plan.

The Department offers the following comments and recommendations to assist the County in avoiding or minimizing potential project impacts on biological resources

1) **Fully Protected Species**: The Department has jurisdiction over fully protected species of birds, mammals, amphibians and reptiles, and fish, pursuant to Fish and Game Code Sections 3511, 4700, 5050, and 5515. "Take" of any fully protected species is prohibited, and the Department cannot authorize their "take." Five fully protected bird species which are particularly susceptible to impacts from wind turbines, the American peregrine falcon (*Falco peregrinus anatum*), brown pelican (*Pelecanus occidentalis*), California least tern *(Sterna albifrons browni),* golden eagle (*Aquila chrysaetos*) and white-tailed kite (*Elanus leucurus*) are known to occur with the County. The fully protected mammal species that could be impacted are bighorn sheep (*Ovis canadensis*) and ring-tailed cat (*Bassariscus astutus*). The CEQA analysis for projects should evaluate and address potential impacts to these species and incorporate appropriate species-specific avoidance and minimization measures during subsequent project implementation.

2) **Other Rare Species:** The potential exists for projects to reduce the number or restrict the range of the following endangered, rare, or threatened species (as defined in Section 15380 of CEQA), which are present within the region: the State threatened Swainson's hawk (*Buteo swainsoni*) and the State Species of Special Concern (SSC) burrowing owl (*Athene cunucularia*), tricolored blackbird (*Agelaius tricolor*), northern harrier (*Circus cyaneus*), loggerhead shrike (*Lanius ludovicianus*), California horned lark (*Eremophila alpestris actia*), Le Conte's thrasher (*Toxostoma lecontei*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), western mastiff bat (*Eumops perotis californicus*), American badger (*Taxidea taxus*) and flat-tailed horned lizard (*Phrynosoma mcallii*). Additional endangered, rare, or threatened species may also be present

3) **Bird Protection**: The Department has jurisdiction over actions that may result in the disturbance or destruction of active nest sites, or the unauthorized take of birds. The pertinent sections of the Fish and Game Code that protect birds, their eggs, and nests include 3503 (regarding unlawful "take," possession, or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the "take," possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful "take" of any migratory nongame birds). The Department is unable to permit project-related "take" of species covered by these code sections, which include all raptors and migratory species.

4) **Administrative Permit**: The County proposes most small wind projects be permitted administratively. Small wind projects that do not meet the standards of the Ordinance could be subject to a variance process. The NOP provided a brief overview of the procedural steps that would be required in process of an administrative permit. Additional CEQA documentation should be required for any project regardless of zoning that has the potential to significantly impact biological resources. The DEIR should clearly define under the administrative permit process thresholds to biological resources whereas the County could require biological studies in situation where impacts to sensitive biological resources may occur. The Department believes that the uncertainties of risk to birds and the long term nature of the impacts to birds and bats require thorough biological studies and corresponding biological resource report with all forthcoming projects. One poorly placed small wind farm has the potential to kill a significant number of birds and bats, including fully protected and sensitive birds for as long as the turbines are in operation (Kerlinger et al.2008, Longcore et al.2008). Therefore, administrative permits for even

small wind projects without further biological evaluations are not appropriate (and should be subject to environmental review under the CEQA).

5) **Design Criteria for Wind Energy Developments:** Impacts to birds and bats due to wind turbine strikes of any size, is well established (Kuvlesky et al. 2007). Even for small wind projects, the amendments to Section 6951 of the ordinance should established standards for setbacks, height restrictions to minimize impacts to avian and bat species in locations in proximity to sensitive habitat lands including wildlife concentration points. The Department recommends standards be included in the ordinance that prohibit tower placement in or near waterways and wetland resources (e.g., vernal pools, stock ponds, or other seasonal pools) which may support listed species. The DEIR should identify appropriate setbacks (or buffer zones) to nest or roost site of a State or Federal threatened or endangered species or Department designated bird or bat SSC, along with considering the potential for collision and noise related impacts to affected species. The referral provided in the NOP for adherence to the "California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" should be adopted in the ordinance language (being applicable to Small/Large Wind Turbine Systems).

   The DEIR should consider alternative designs for all wind systems. The Department recommends, the ordinance describe options for less environmentally damaging alternatives in regards to the type of wind turbine (e.g., selection of vertical axis turbines, then horizontal axis turbines) or whether a preference for the building-mounted systems versus free-standing towers was considered. Supplemental guidance/standards should include requiring towers that are monopole design and self-supporting without the use of guy wires or other similar features. Requiring monopole designs whenever feasible would eliminate the increase of potential nesting and perching sites for opportunistic birds (e.g., common raven, crow, scrub-jay), thus minimizing the likelihood for increased predation of listed and sensitive wildlife species. Depending on the type of tower design selected, standards should be adopted that include using deterrents as perching and nesting prevention devices (selecting treatments that do not harm birds). Furthermore, protection measures should include reducing artificial habitat for prey at turbine base area and minimizing power line impacts by undergrounding lines.

6) **Ordinance Language:** The Department recommends appropriate design features be considered for insertion into the ordinance language. If not included in the ordinance language itself then the County should develop a separate guidance document for staff to defer to in implementing the ordinance.

7) **Avoid Guy Wires when Feasible:** Guy wires supporting communications and meteorological towers can kill birds at high rates, including birds protected by the Fish and Game Code (Kerlinger et al. 2008, Longcore et al. 2008). Both the CEC-Department Guidelines and the USFWS (2000) recommend using free-standing tower designs due to the known avian mortality impacts from guy wires. The region is known to support many species that are susceptible to guy wire collisions, including golden eagles, tricolored blackbirds, burrowing owls, northern harrier, and Swainson's hawk. Project sites that may permit this type of installation may also support the fully protected species; golden eagle, and white-tailed kite, which are known to collide with electrical distribution wires. Several of these species are known to be susceptible to mortality from striking guy wires on communications and meteorological towers, or could be adversely affected by construction activities. If guy wires cannot be avoided the Ordinance should include specific procedures and standards to minimize bird strikes/collisions:

a) Data (Kerlinger et al. 2008, Longcore et al. 2008) demonstrates that there is substantial uncertainty as to the potential for guy wire collisions with protected/special status bird species.

b) To reduce the potential for significant injury or mortality of special status birds, including raptors and migratory species, a condition of approval should be added to state substantially similar to the following: "The applicant shall install yellow bird flight diverters every 15 ft on each guy wire installed. Diverters shall be by Preformed Line Products, Bird Flight™ Diverters, or equal as approved by the Department, and shall be high-impact PVC material with UV protection."

8) **Turbine Location:** Each turbine locations should be studied to confirm that the tower sites are not within bird migratory corridors. Wind turbines should not be allowed in significant bird migration corridors.

9) **Avian Protection Plan:** In areas where impacts to birds and bats are likely, the Department recommends Avian Protection Plans be prepared which include post construction, and annual reporting to the County and the Department. Based on the analysis and guidance provided in the NOP, if a fatality to a protected species occurs, there is no assurance the information will be recorded or reported. A condition of approval should be added to state substantially similar to the following: "The applicant shall perform a weekly carcass survey of each site and report the findings at least quarterly to the County and to the Department. Any fatality of a protected species, including all raptors and listed species, shall immediately be reported to the agency with jurisdiction by law."

10) **Bat Surveys for Wind Energy Developments:** Installing meteorological (met) towers in advance of wind energy development provides an opportunity to begin gathering baseline bat use data. This bat use data is used to assess potential impacts to bats from wind turbine operation as recommended in the CEC-Department. To provide defensible baseline data for bat impacts, the Department recommends installing two (2) acoustic detectors on each tower: one at 1.5 meters from ground level, and one as high as possible, within the potential rotor-swept zone. Bat use should be monitored nightly for one (1) year prior to CEQA analysis. Additional methods may be warranted for a project site; the Department is available to provide guidance to applicant's to develop site-specific bat survey methods for any future wind energy proposals. If a subsequent bat (or avian) monitoring program is required under post approval then the permit approval conditions should require that documentation be provided to the Department.

11) **Acoustical Monitoring:** If the towers are for assessing wind energy development potential, then the Department recommends deploying acoustic monitoring equipment on the met towers for at least one year to determine bat use levels and potential impacts to bats from wind turbines. Additional methods for assessing avian and bat mortality impacts would be warranted for wind energy development at this site. We encourage the County and the applicant to coordinate with the Department on study methods as soon as possible to avoid future project delays. Please refer to the joint California Energy Commission and Department guidelines (CEC-Department Guidelines) for guidance on how to adequately assess potential bird and bat mortality from wind energy development (CEC and Department 2007).

12) **Use Red, Flashing Tower Lights:** Night-migrating birds are the most common fatalities at wind energy facilities. To minimize night-migrating bird collisions on associated structures, continuous lighting and light colors other than red should be avoided. If aviation or other lighting is required on the meteorological towers, then the Department recommends red flashing lights with a long dark interval and short flash-on time.

13) **Consistency with Existing and Draft Regional Conservation Plans:** The DEIR should evaluate the proposed ordinance's consistency with our regulations and the County's MSCP. Specifically, Section IV, Biological Resources, of the CEQA initial study, items a), b), c), d) and e) require additional information. This information is needed by the Wildlife Agencies to make clear the types of projects which would be approved, and in particular identify potential conflicts with essential species and regional conservation planning objectives associated within the existing South County MSCP and forthcoming North County and East County MSCPs. If the Department cannot adequately evaluate these issues and quantify the potential impacts, we may be unable to issue permits for the North County and East County MSCPs and/or concur that the proposed amendment is consistent with the approved South County MSCP.

14) **Cumulative Impacts:** A cumulative effects analysis should be developed as described under CEQA Guidelines, section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats. The DIER should include a detailed cumulative analysis of the impacts to biological resources as a result of small and large wind systems.

We appreciate the opportunity to comment on the NOP for the ordinance revision and to assist the County in further minimizing and mitigating project impacts to biological resources. If you have any questions or comments regarding this letter, please contact Erinn Wilson, Staff Environmental Scientist of the Department at (714) 968-0953.

Sincerely,

Edmund Pert
Regional Manager
South Coast Region

cc: State Clearinghouse, Sacramento
Scott Flint, Habitat Conservation Planning Branch
Doreen Stadtlander, U.S. Fish and Wildlife Service, Carlsbad

ec: Stephen M. Juarez, DFG, San Diego
David Mayer, DFG, San Diego
Randy Rodriquez, DFG, San Diego
Paul Schlitt, DFG, San Diego
Erinn Wilson, DFG, San Diego

Literature Cited

California Energy Commission and Department of Fish and Game (2007) California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Siting Division, and California Department of Fish and Game, Resources Management and Policy Division. CEC-700-2007-008-CMF.

Kerlinger, P., R. Curry, L. Culp, and A. Hasch (2008) Pre-construction meteorological tower fatality study Shiloh II wind power project, Solana County, California. Prepared by Curry and Kerlinger, LLC for Enxco.

Kuvlesky Jr. WP, Brennan LA, Morrison ML, Boydston KK, Ballard BM, et al. (2007) Wind Energy Development and Wildlife Conservation: Challenges and Opportunities. Journal of Wildlife Management: Vol. 71, No. 8 pp. 2487–2498

Longcore, T., C. Rich, S.A. Gathreaux Jr. (2008) Height, guy wires, and steady-burning lights increase hazard of communication towers to nocturnal migrants: a review and meta-analysis. The Auk 125:485-492.

U.S. Fish and Wildlife Service (2000) Service guidance on the siting, construction, operation and decommissioning of communication towers. U.S. Fish and Wildlife service, Washington, D.C.

State of California **Natural Resources Agency**

Memorandum

To: County of San Diego
5201 Ruffin Road, Suite B
San Diego, CA 92123-1666
Attn: Matthew Schneider

Date: September 30, 2010

Website: www.fire.ca.gov

Re: County of San Diego Wind Energy Ordinance
SCH2010091030
Notice of Preparation (Environmental Impact Report)

After review of the above referenced document, the project complies with Public Resource Codes (PRC), California Fire Code (CFC) and Consolidated Fire Code for San Diego County applicable to Wildland fire for non habitable structures. As a Note The Memorandum of Understanding (MOU) dated February 26, 1997 states Structures intended for occupancy by humans or animals be located no less than 100 feet from the nearest biological open space or boundary and all other structures no less than 30 feet from biological open space or boundary. The MOU was based upon the US Fish and Wildlife Biological Opinion of 1997.

Mark Ostrander
CAL FIRE
San Diego Unit
Environmental Coordinator
P.O. Box 1560
Boulevard, CA 91905

Mandated Due Date:	10/12/10
Date Document Received in Mail:	09/23/10
Comment Letter Date:	09/30/10
Date Mailed:	10/01/10

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cathleen Cox
Acting Director

Notice of Preparation

September 15, 2010

To: Reviewing Agencies

Re: County of San Diego Wind Energy Ordinance
SCH# 2010091030

Attached for your review and comment is the Notice of Preparation (NOP) for the County of San Diego Wind Energy Ordinance draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Matthew Schneider
San Diego County
5201 Ruffin Road, Suite B
San Diego, CA 92123

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments.
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2010091030
Project Title County of San Diego Wind Energy Ordinance
Lead Agency San Diego County

Type NOP Notice of Preparation

Description The project proposes amendments to the County of San Diego Zoning Ordinance for wind energy systems. The amendments consist of clarifications, deletions, and revisions to provide an updated set of definitions, procedures, and standards for review and permitting of wind energy systems. The proposed project includes the allowance of small wind energy systems that meet the definition of the Zoning Ordinance by right; and large turbines will be required to complete a separate environmental review process per the Major Use Permit procedures and requirements.

Lead Agency Contact

Name Matthew Schneider
Agency San Diego County
Phone 858-694-3714 **Fax**
email
Address 5201 Ruffin Road, Suite B
City San Diego **State** CA **Zip** 92123

Project Location

County San Diego
City
Region
Cross Streets Countywide
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways Hwy 67, 76, 78, 79, 94, & 125
Airports Countywide
Railways Countywide
Waterways Countywide
Schools Countywide
Land Use Various- applies Countywide

Project Issues Aesthetic/Visual; Agricultural Land; Archaeologic-Historic; Biological Resources; Forest Land/Fire Hazard; Noise; Wildlife; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Fish and Game, Region 5; Cal Fire; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Caltrans, Division of Aeronautics; California Highway Patrol; Caltrans, District 11; State Water Resources Control Board, Division of Water Quality; Native American Heritage Commission; Public Utilities Commission; State Lands Commission

Date Received 09/13/2010 **Start of Review** 09/13/2010 **End of Review** 10/12/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: San Diego SCH# 2010041030

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Mike Sotelo
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Rebecca Salazar
- [ ] **California Energy Commission**
  Eric Knight
- [x] **Cal Fire**
  Allen Robertson
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [x] **Office of Historic Preservation**
  Ron Parsons
- [x] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [x] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Game Region 2**
  Jeff Drongesen
- [ ] **Fish & Game Region 3**
  Charles Armor
- [ ] **Fish & Game Region 4**
  Julie Vance
- [x] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [ ] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [ ] **Dept. of Public Health**
  Bridgette Binning
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Linda Flack
- [ ] **Cal EMA (Emergency Management Agency)**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [x] **Public Utilities Commission**
  Leo Wong
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [x] **State Lands Commission**
  Marina Brand
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [x] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  Scott Loetscher
  Office of Special Projects
- [ ] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Bruce de Terra
- [ ] **Caltrans, District 4**
  Lisa Carboni
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Elmer Alvarez
- [ ] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [x] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Chris Herre

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
  - [ ] Transportation Projects
    Douglas Ito
  - [ ] Industrial Projects
    Mike Tollstrup
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [x] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 07/12/10

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

September 16, 2010

Mr. Matthew Schneider, Land Use/Environmental Planner
County of San Diego Department of Planning & Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123-1666

Re: SCH#2010091030 CEQA Notice of Preparation (NOP): draft Environmental Impact Report for the **County of San Diego Wind Energy Ordinance Project** located County-Wide; San Diego County, California.

Dear Mr. Schneider:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 for the protection and preservation of California's Native American Cultural Resources. (Also see *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604).* The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amendment effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance. The lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. State law also addresses Native American Religious Expression in Public Resources Code §5097.9.

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.94(a) and Native American Cultural Resources **were identified** within the County of San Diego; there are over 19,000 recorded Native American cultural sites recorded from San Diego County. Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the culturally affiliated tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes.

Furthermore the NAHC recommends that you contact the California Historic Resources Information System (CHRIS) of the Office of Historic Preservation (OHP), for archaeological data. (916) 653-7278.

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f]*et se),* 36 CFR Part 800.3, the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.* Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e).

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens. Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does mandate tribal consultation for the 'electric transmission corridors. This is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC

Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony.

Again, Lead agencies should consider avoidance, as defined in §15370 of the California Code of Regulations (CEQA Guidelines), when significant cultural resources are discovered during the course of project planning and implementation.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Culturally Affiliated Native American Contacts

Cc: State Clearinghouse

Native American Contacts
San Diego County
September 16, 2010

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside , CA 92040
sue@barona-nsn.gov
(619) 443-6612
619-443-0681

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
PO Box 365 — Diegueno
Valley Center, CA 92082
allenl@sanpasqualband.com
(760) 749-3200
(760) 749-3876 Fax

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road — Diegueno/Kumeyaay
Alpine , CA 91901
wmicklin@leaningrock.net
(619) 445-6315 - voice
(619) 445-9126 - fax

Santa Ysabel Band of Diegueno Indians-Ilpai
Johnny Hernandez, Spokesman
PO Box 130 — Diegueno
Santa Ysabel, CA 92070
brandietaylor@yahoo.com
(760) 765-0845
(760) 765-0320 Fax

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
PO Box 1120 — Diegueno/Kumeyaay
Boulevard , CA 91905
gparada@lapostacasino.
(619) 478-2113
619-478-2125

Sycuan Band of the Kumeyaay Nation
Danny Tucker, Chairperson
5459 Sycuan Road — Diegueno/Kumeyaay
El Cajon , CA 92021
ssilva@sycuan-nsn.gov
619 445-2613
619 445-1927 Fax

Manzanita Band of Kumeyaay Nation
Leroy J. Elliott, Chairperson
PO Box 1302 — Kumeyaay
Boulevard , CA 91905
ljbirdsinger@aol.com
(619) 766-4930
(619) 766-4957 Fax

Viejas Band of Mission Indians
Bobby L. Barrett, Chairperson
PO Box 908 — Diegueno/Kumeyaay
Alpine , CA 91903
jrothauff@viejas-nsn.gov
(619) 445-3810
(619) 445-5337 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.

This list is only applicable for contacting local Native Americans for consultation purposes with regard to cultural resources impact by the proposed SCH#2010091030; CEQA Notice of Preparation; NOP); draft Environmental Impact Report (DEIR) for the County of San Diego Wind Energy Ordinance; Definitions, procedures and standards conforming to San Diego County zoning and other ordinances; San Diego County, cAlifornia.

Native American Contacts
San Diego County
September 16, 2010

Kumeyaay Cultural Heritage Preservation
Paul Cuero
36190 Church Road, Suite 5 Diegueno/ Kumeyaay
Campo , CA 91906
chairman@campo-nsn.gov
(619) 478-9046
(619) 478-9505
(619) 478-5818 Fax

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas
P.O. Box 775 Diegueno -
Pine Valley , CA 91962
(619) 709-4207

Inaja Band of Mission Indians
Rebecca Osuna, Spokesperson
2005 S. Escondido Blvd. Diegueno
Escondido , CA 92025
(760) 737-7628
(760) 747-8568 Fax

Kumeyaay Cultural Repatriation Committee
Steve Banegas, Spokesperson
1095 Barona Road Diegueno/Kumeyaay
Lakeside , CA 92040
(619) 742-5587
(619) 443-0681 FAX

San Luis Rey Band of Mission Indians
Henry Contreras, Most Likely Descendant
1763 Chapulin Lane Luiseno
Fallbrook , CA 92028
(760) 728-6722 - Home
(760) 908-7625 - Cell

San Luis Rey Band of Mission Indians
Russell Romo
12064 Old Pomerado Road Luiseno
Poway , CA 92064
(858) 748-1586

Pauma Valley Band of Luiseño Indians
Bennae Calac, Tribal Council Member
P.O. Box 369 Luiseno
Pauma Valley CA 92061
bennaecalac@aol.com
(760) 617-2872
(760) 742-3422 - FAX

Rincon Band of Mission Indians
Bo Mazzetti, Chairperson
P.O. Box 68 Luiseno
Valley Center, CA 92082
council@rincontribe.org
(760) 749-1051
(760) 749-8901 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.

This list is only applicable for contacting local Native Americans for consultation purposes with regard to cultural resources impact by the proposed SCH#2010091030; CEQA Notice of Preparation; NOP); draft Environmental Impact Report (DEIR) for the County of San Diego Wind Energy Ordinance; Definitions, procedures and standards conforming to San Diego County zoning and other ordinances; San Diego County, cAlifornia.

Native American Contacts
San Diego County
September 16, 2010

Kumeyaay Diegueno Land Conservancy
M. Louis Guassac, Executive Director
P.O. Box 1992 Diegueno/Kumeyaay
Alpine , CA 91903
guassacl@onebox.com
(619) 952-8430

Frank Brown
Viejas Kumeyaay Indian Reservation
240 Brown Road Diegueno/Kumeyaay
Alpine , CA 91901
FIREFIGHTER69TFF@AOL.
619) 884-6437

Campo Kumeyaay Nation
Michael L. Connolly, Consultant
1600 Buckman Springs Rd Diegueno/Kumeyaay
Campo , CA 91906
(610) 478-2177

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.

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San Diego County Archaeological Society, Inc.

Environmental Review Committee

20 September 2010

To: Mr. Matt Schneider
Department of Planning and Land Use
County of San Diego
5201 Ruffin Road, Suite B
San Diego, California 92123-1666

Subject: Notice of Preparation of a Draft Environmental Impact Report
Wind Energy ordinance
POD 10-007

Dear Mr. Schneider:

Thank you for the Notice of Preparation for the subject project, received by this Society earlier this month.

We are pleased to note the inclusion of cultural resources in the list of subject areas to be addressed in the DEIR, and look forward to reviewing it during the upcoming public comment period. To that end, please include us in the distribution of the DEIR, and also provide us with a copy of the cultural resources technical report(s).

SDCAS appreciates being included in the County's environmental review process for this project.

Sincerely,

James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: SDCAS President
File

P.O. Box 81106 • San Diego, CA 92138-1106 • (858) 538-0935

BACKCOUNTRY AGAINST DUMPS

P. O. BOX 1275, BOULEVARD, CA 91905

October 11, 2010

Matt Schneider,
Project Manager
County of San Diego
Dept of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123-1666

Sent via e-mail: Matthew.Schneider@sdcounty.ca.gov

RE: WIND ENERGY ORDINANCE; POD 10-007; NOTICE OF PREPARATION OF EIR

Dear Mr. Schneider,

These comments are being submitted in addition to those submitted by the Law Offices of Stephan C. Volker on our behalf.

I am incorporating, by reference, the comments I drafted and submitted today on behalf of the Boulevard Planning Group and Mr. Volker's previous comments submitted on the proposed Wind Energy Ordinance changes on March 26th and July 15th of 2010.

Regards,

/s/

Donna Tisdale
619-766-4170
donnatisdale@hughes.net

BOULEVARD PLANNING GROUP
P. O. BOX 1272, BOULEVARD, CA 91905

Matt Schneider, Project Manager
County of San Diego
Dept of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123-1666

October 11, 2010

Sent via e-mail: Matthew.Schneider@sdcounty.ca.gov

RE: WIND ENERGY ORDINANCE; POD 10-007; NOTICE OF PREPARATION OF EIR

"Instead of being politically correct, we need to be scientifically correct, and look for better solutions" John Droz, Jr. / Physicist

Dear Mr. Schneider,

At our regular meeting, held on October 7th, our group unanimously approved the following motion 6-0-0 (Lenz absent): *Send in updated comments, insisting that the Wind Energy Ordinance EIR include large scale wind turbines, as we previously requested. Reiterate the need for adequate standard turbine set-back of at least 1.5 to 2 miles from occupied buildings, recreation areas, public roads, protected habitat and wildlife, and more. Request a lower height limit of 65 feet for small turbines and refer to Oct 29-31 International Symposium on The Global Wind Industry and Adverse Health Effects. Submit these comments, incorporating our previous wind energy comments by reference, by the October 11 deadline.*

We want to note that POD 09-006 previously covered both wind and solar issues. The solar ordinance moved forward under POD 09-006. Part of POD 10-007 (previously a part of POD 09-006) of Comprehensive Revisions to Wind Energy Regulations, which was on public review earlier this year, is now part of this EIR process.

This piecemealed and segregated review process has been very confusing for the public, especially the fact that the current EIR does not cover large scale turbines that represent the most significant negative and cumulative impacts and harm to a broad spectrum of resources as well as public health and safety, and economic and social justice issues.

Boulevard Planning Group's previous comments submitted to the County on wind energy issues that are incorporated by reference:

- **March 11, 2010:** Solar Wind Energy Zoning Ordinance Amendment (POD 09-006); 20 page comment letter with links and attachments.

- **June 16, 2010:** Solar Energy Zoning Ordinance Amendment (POD 09-006).Comment letter.

- **July 5, 2010:** POD 10-007: Minor Changes to existing Wind Turbine Regulations in Zoning Ordinance. Comment letter

- **September 9, 2010:** CASE# 3000-10-023: Pack MET tower application. Comment letter and request for public hearing.

- **September 21, 2020:** POD 10-007 EIR scoping hearing. Planning Group members, Donna Tisdale and Chris Noland, attended the hearing. Both requested that the EIR include large scale industrial wind turbines stating the need for an adequate standard set-back and other important requirements. Both staff and members of the public seemed confused by current and previous wind energy ordinance actions.

The aerial photo below shows the existing 50 MW Kumeyaay Wind facility located on the Campo Kumeyaay Nation that lies within the boundaries of the Boulevard Planning Area. Multiple large scale wind energy projects proposed on private, public and tribal lands will further negatively impact currently large areas of intact habitat and wildlife corridors, that may be avoided in future due to noisy and disturbing industrial scale development.

The following photos are just two examples of concerns with the proliferation of industrial wind turbines into our rural high-fire danger areas, with limited fire stations, staffing, and equipment. The first photo shows a turbine that was struck by lightning. East County is subject to intense electrical storms. The presence of turbines can increase the number of lightning strikes. Kumeyaay Wind has already suffered one catastrophic failure.

The following is updated information from our previous comments submitted on POD 09-006 March 11, 2010:

They're Not Green: A short video clip from a Nettie Pena documentary on industrial wind energy problems: http://www.epaw.org/multimedia.php?lang=en&article=news6 : The documentary includes a list of communities, world-wide, that are dealing with impacts from industrial wind energy projects. Boulevard, is at the end of the list.

Getting Serious About Setbacks: An editorial on small wind turbines placed in appropriate areas with inadequate setbacks: http://www.windaction.org/faqs/29334

Proposed Case Definition: Adverse Health Effects And Industrial Wind Turbines living within 2.0 km of an industrial wind turbine facility. This is terrain dependant and those living in hilly or mountainous terrain may be affected within 5.0 km. Off shore industrial wind turbines may affect people within 5km. http://windvigilance.com/page99.aspx

The First International Symposium on the adverse health effects of industrial wind turbines will be held October 29-31, 2010 in Picton, Prince Edward County, Ontario, Canada.

This two day event, hosted by The Society for Wind Vigilance, will feature prominent expert speakers from the United Kingdom, the United States and Canada who will provide important information relating to health issues reported by people living too close to industrial wind developments.

The Society for Wind Vigilance is an international federation of physicians, engineers and other professionals promoting the development of authoritative wind turbine guidelines to protect the health and safety of communities. The mission of The Society for Wind Vigilance is to mitigate the risk of both physiological and psychological adverse health effects through the advancement of independent third party research and its application to the siting of industrial wind turbines.

Currently there are no authoritative guidelines for the siting of industrial wind turbines. Globally industrial wind turbine facilities are being erected at a record pace and are increasingly being sited close to human populations. Noise and setback requirements vary widely by jurisdiction. As a result there are victims who are reporting adverse health effects from exposure to industrial turbine facilities. In many cases families have had to abandon their homes to protect health.

The Society for Wind Vigilance is a volunteer-based federation which leads in education on the adverse health effects of human exposure to wind turbines.

Board of Directors

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Carl V. Phillips, PhD
Alec N. Salt, Ph.D. Cochlear Physiology, M.Sc., B.Sc. Biology
Daniel Shepherd, BA, MSc(1st Class Hons), PhD
Robert Thorne, PhD

The following information has been excerpted from the linked Society For Wind Vigilance website: http://windvigilance.com/page002.aspx.

Go to the website to find the full documents and linked reference documents.

A Primer on Adverse Health Effects: http://windvigilance.com/primer_ahe.aspx

Wind Turbine Noise Sleep and Health by Dr Hanning

Dr. Christopher Hanning concludes in *Sleep disturbance and wind turbine noise*

"…there is compelling evidence that wind turbine noise can and does disturb sleep and impair the health of those living too close and that current guidance is inadequate protection."

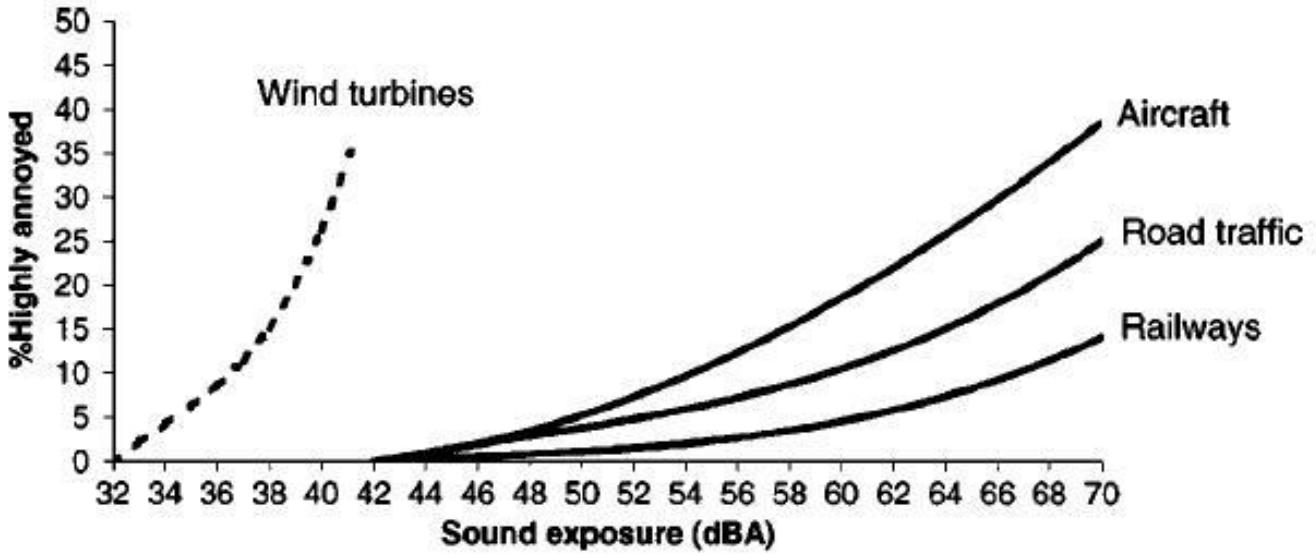
"In my expert opinion, from my knowledge of sleep physiology and a review of the available research, I have no doubt that wind turbine noise emissions have been clearly associated with sleep disturbances."

Dr. Hanning has nearly 30 years experience in sleep and its disorders. His expertise in this field has been accepted by the civil, criminal and family courts. Further details about his credentials are cited in the article. http://windvigilance.com/noise_sleep_health.aspx

Adverse Health Effects & Wind Turbines: http://www.windvigilance.com/about_ahe.aspx

Annoyance and Wind Turbines: http://www.windvigilance.com/annoyance_ahe.aspx

Peer reviewed scientific articles based on studies of European wind turbine facilities have concluded that wind turbine noise is more annoying than equally loud noise sources such as airport and traffic noise. i[ii], ii[iii], iii[iv], iv[v] Annoyance is predominately attributed to the unique sound characteristics of wind turbine noise.



Sound exposure is for wind turbines calculated A-weighted L_{eq} for a hypothetical time period and for transportation DNL.

(Source: Pedersen, E. and K. Persson Waye. 2004. Perception and annoyance due to wind turbine noise: A dose–response relationship, Journal of the Acoustical Society of America 116: 3460–3470.)

- "The sound level associated with wind turbines at common residential setbacks …may lead to annoyance and sleep disturbance." v[vi] and evidence demonstrates "Annoyance and sleep disruption are common when sound levels are 30 to 45 dBA." vi[vii]

Stress and Wind Turbines: http://www.windvigilance.com/stress_ahe.aspx

- *"Even seemingly clean sources of energy can have implications on human health. Wind energy will undoubtedly create noise, which increases stress, which in turn increases the risk of cardiovascular disease and cancer."* vii*[1]*

Sleep Disturbance and Wind Turbines :
http://www.windvigilance.com/sleep_disturbance_ahe.aspx

Based on the best available science the following conclusions can be made:

- Wind turbine noise, including low frequency noise, may cause annoyance, stress and sleep disturbance.

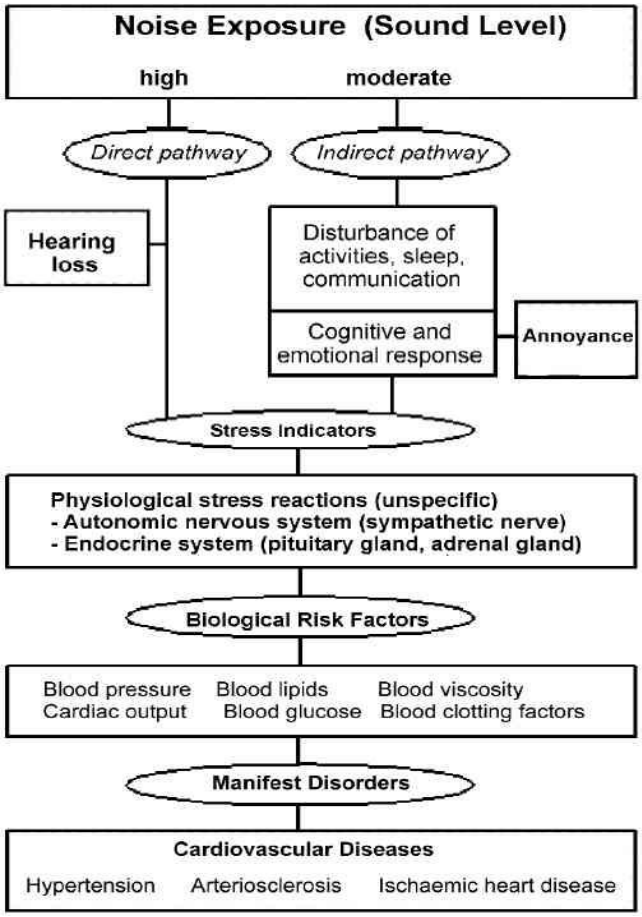
- Wind turbine induced sleep disturbance occurs at common residential setbacks and when sound levels are higher than 30 dBA.

- The consequences of sleep disturbance can be serious. Acknowledged symptoms include poor performance at work, fatigue, memory difficulties, concentration problems, motor vehicle accidents, mood disorders (depression, anxiety), alcohol and other substance abuse, cardiovascular, respiratory, renal, gastrointestinal, musculoskeletal disorders, obesity, impaired immune system function and a reported increased risk of mortality.

Physiological Health and Wind Turbines:

http://www.windvigilance.com/physiological_ahe.aspx

- Wind turbine physiological adverse effects documented by clinicians and researchers are consistent with symptoms commonly associated with annoyance viii[14], stress ix[15],x[16] and sleep disturbance. xi[17]



- Currently there is no authoritative international guideline for wind turbine noise designed to protect human health

Mental Health and Wind Turbines: http://www.windvigilance.com/mental_health_ahe.aspx

- Clinicians and other researchers have documented both physiological and psychological symptoms reported by victims experiencing adverse health effects from wind turbines. [2],[3],[4],[5] Many families have abandoned their homes to protect their health. This cannot be denied.
- The reported psychological symptoms include decreased quality of life, stress, anxiety, depression, cognitive dysfunction, anger, grief, and a sense of injustice.
- World Health Organization acknowledges individuals suffering adverse psychological symptoms are often victimized from a lack of understanding.[6] Often the stigma, discrimination and human rights violations that affected individuals and families endure are intense and pervasive.[7]

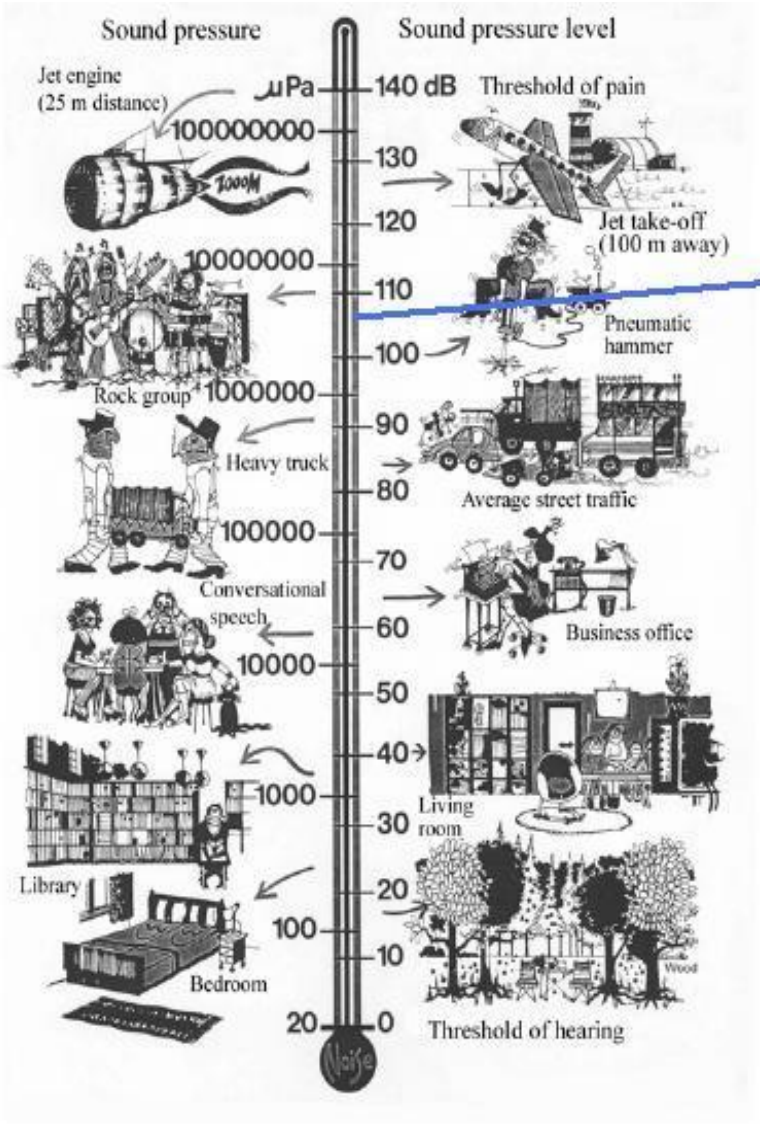
Noise and Wind Turbines: http://www.windvigilance.com/noise_ahe.aspx

- *"Just like air pollution and toxic chemicals, noise is an environmental hazard to health." - World Health Organization*

- The Canadian Wind Energy Association claims that modern wind turbines are not noisy.[xii][2] They also assure the public that "it's possible to carry on a normal conversation at the base" of a wind turbine and at 300 meters the sound is like a "whispering voice."[xiii][3]

- In light of this information one may ask why are people reporting suffering from adverse health effects and why have families abandoned their homes?

- The answer is wind turbines are noisy. A single modern wind turbine emits approximately 105 dBA of industrial noise pollution.[xiv][4] To put 105 dBA in perspective, this is between the sound power level of a pneumatic hammer drill and a rock band.[xv][5] Additional wind turbines in the neighbourhood combine to increase the noise level.



Sound Pressure Level (SPL) Examples (Bruel and Kjaer Instruments)

Wind turbine noise propagation is complex. A person standing under a wind turbine may experience much less noise than someone else living in a home hundreds of meters away from the base of the wind turbine.

Low Frequency Noise, Infrasound and Wind Turbines:

http://www.windvigilance.com/low_freq_noise_ahe.aspx

- Wind turbines generate a broad spectrum of noise including low frequency noise and infrasound which may be audible or inaudible. [1], [2], [3], [4]
- It is widely affirmed that exposure to audible low frequency noise can cause adverse health effects in humans. [5], [6], [7], [8]

- Low frequency noise can cause "…immense suffering to those who are unfortunate to be sensitive to low frequency noise and who plead for recognition of their circumstances." [9]
- "Wind turbines are generally located in areas devoid of trees and other large vegetation. Instead, ground cover usually consists of grass, sagebrush, plants, and low shrubs, which are minor impediments to noise propagation except at very high frequencies. At frequencies below about 1000 Hz, the ground attenuation is essentially zero." [10]
- The farther away from the wind turbine the greater is the low frequency content due to a relatively larger atmospheric absorption of high frequencies. Considering the A-weighted sound level outdoors in relevant distances to neighbors, the lower frequencies constitute a substantial part of the noise. [11]
- There is no doubt that as wind turbines get larger and more densely sited the lower frequency part of the noise spectrum is of importance to the neighbours' perception of noise from large wind turbines. Noise from wind turbines is under certain atmospheric conditions more annoying and - especially the low frequency part - spread much farther than generally accepted. Wind turbines may cause low frequency noise induced annoyance both inside and outside a building. [12]
- Annoyance is an acknowledged adverse health effect. [13], [14]

Visual Health Effects and Wind Turbines: http://www.windvigilance.com/visual_ahe.aspx

Based on the best available science the following conclusions can be drawn: http://www.windvigilance.com/about_ahe.aspx:

- Wind turbines produce noise and visual burdens.
- Scientific research confirms visuals impacts can adversely affect human health.
- Wind turbine shadow flicker has the potential to induce photosensitive epilepsy seizures however the risk is low with large modern models and if proper planning is adhered to.
- Wind turbine shadow flicker induced adverse human health effects include annoyance and/or stress.
- No generalized dose-response curves have yet been modeled for wind turbine shadow flicker primarily due to the lack of results of published field studies.
- Protection from wind turbine shadow flicker exposure must be engineered into the design of the wind turbine facility during the planning stage.

The following information was taken from the referenced sources:

Wind energy is intermittent and can result in the need for more gas-fired power plants.

U.S. DOE Report "20% Wind Energy by 2030" Presents Implausible Scenario: The DOE *Report ignores back-up generation, real growth rate, and capacity factors;* http://www.windaction.org/releases/16239 **;**

Renewables need helping hand from gas:
http://www.signonsandiego.com/news/2010/may/23/renewables-need-helping-hand-from-gas/

"...Gas will continue to be an important part of the mix even as the share of electricity generated with solar panels, wind turbines, underground heat or methane from landfills and sewage plants increases.

"Natural gas ought to be viewed as complementary, and not competing with renewables," said Jim Marston, director of energy programs for the Environmental Defense Fund.

Electricity can't be stored at the scale that utilities distribute it. It has to be used the moment it is produced.

So in a way, additional solar and power generation can actually increase the need for backup gas plants to help deal with the whims of the weather..."

E.ON warns over backup for renewables: http://www.windaction.org/news/16197; http://www.guardian.co.uk/environment/2008/jun/04/...

June 4, 2008 by Mark Milner in The Guardian

One of Britain's leading energy providers warned yesterday that Britain will need substantial fossil fuel generation to back up the renewable energy it needs to meet European Union targets. The UK has to meet a target of 15% of energy from renewables by 2020.

E.ON said that it could take 50 gigawatts of renewable electricity generation to meet the EU target. But it would require up to 90% of this amount as backup from coal and gas plants to ensure supply when intermittent renewable supplies were not available. That would push Britain's installed power base from the existing 76 gigawatts to 120 gigawatts.

Paul Golby, E.ON UK's chief executive, declined to be drawn on how much the expansion would cost, beyond saying it would be "significant". Industry sources estimate the bill for additional generation could be well in excess of £50bn...

Wind farm accidents and increased insurance rates and other costs

The Dangers of Wind Power http://www.windaction.org/news/11519

After the industry's recent boom years, wind power providers and experts are now concerned. The facilities may not be as reliable and durable as producers claim. Indeed, with thousands of mishaps, breakdowns and accidents having been reported in recent years, the difficulties seem to be mounting. Gearboxes hiding inside the casings perched on top of the towering masts have short shelf lives, often crapping out before even five years is up. In some cases, fractures form along the rotors, or even in the foundation, after only limited operation. Short circuits or overheated propellers have been known to cause fires. All this despite manufacturers' promises that the turbines would last at least 20 years.

August 24, 2007 by Simone Kaiser and Michael Fröhlingsdorf in Business Week
As wind turbines multiply around the globe, the number of dangerous accidents is also climbing, causing critics to question overall safety

Durability of green energy products tested in windstorm. January 19, 2010:
http://disastersafety.typepad.com/disaster_safety_blog/2010/01/page/2/

"Looking ahead to the kinds of "green" risks insurers can expect to face as the nation moves toward a more environmentally conscious approach to energy and construction, **Robert Hartwig, Ph.D., who is president of Insurance Information Institute, points to "mini power plants" in communities and individual homes as one issue that deserves attention.** Dr. Hartwig made this point during the Institute for Business & Home Safety's annual conference ***Going Green and Building Strong***, which was held in December. See Dr. Hartwig's presentation."

"It's important to keep this in mind when considering a recent story that was published by the *San Diego Union-Tribune*. The newspaper wrote about the performance of wind farms after a wind storm that packed gusts of more than

60 mph. Without doubt, as wind farms grow so will the opportunity to insure the risks that accompany these operations, so this real-world event may be of interest. It's really a question of durability, which is the underlying theme that relates to all aspects of the still-developing "green" construction and energy movements."

Catastrophic failure at Kumeyaay Wind December 2009:

The two articles, linked below, show photos of the leaking, damaged and headless turbines at Campo Kumeyaay Wind facility. They also discuss the removal of all 75 blades from the 25 turbines at Kumeyaay Wind due to damage suffered in a December 7, 2009 storm where winds topped 70 mph: http://www.signonsandiego.com/news/2010/jan/13/damaging-blow http://www.eastcountymagazine.org/node/2734

At two of last week's Department of Energy three hearings on the draft EIS for Sempra's Energia Sierra Juarez wind energy project, several members of the public testified on how the Harris Fire, the Cedar Fire and the Witch Creek Fire storms have raised our fire insurance rates. Many people were cancelled altogether. The fire storms that were caused by SDG&E's equipment will also raise our utility rates, due to increased insurance costs for SDG&E

The 25 Kumeyaay turbines are 2 MW Gamesa. The project did not undergo an EIR or EIS. They got through on an EA. Our letter May 2010 letter to the Secretary of Interior, requesting an investigation into the catastrophic failure, and other accidents at the site, has never been answered.

Negative impacts on property values

Properties 'virtually unmarketable': http://www.windaction.org/news/29241

Taylor said in his report that rural property close to town is usually in good demand, and noted he's the agent for one parcel in the area. He has had over 50 inquiries on his listing in about two months, but 40 dropped interest after learning about the location. "In follow-up with the inquiries, the number one reason for not having genuine interest in this property is because of the proximity of the wind towers."

September 22, 2010 by Greg Fladager in Casper Journal

A survey by a local realtor may have confirmed the worst suspicions of Stan Mundy, whose home is closest to Chevron's wind farm northeast of Casper.

Glen Taylor, of Equity Brokers in Casper, did a real estate survey Sept. 10, 2010, and concluded properties directly adjacent to the Chevron Wind Towers are now "virtually unmarketable" at "any realistic price."

In his report, Taylor said no residential properties have sold in his three-road survey area since October 2009, and 10 are presently on the market (five that were listed in the past two years didn't sell).

Taylor wrote, "No reasonable buyer would choose a property close to the wind towers over a property that isn't close to wind towers unless the price is so low that the investment would be a no brainer."

U.S. wrestling with property values and setbacks for its wind turbines :
http://www.windaction.org/news/29171

Use effects include the loss of peaceful use and enjoyment of homesteads for many turbine neighbours, and there is evidence that livestock has been adversely impacted by the noise from turbines, ranging from death (goats in Taiwan) to reproductive disorders (in Wisconsin) and behavioral changes and irritability of horses and cattle. Those may also represent cost effects, in some cases, or other forms of financial impact.

September 17, 2010 by David Meyer in The Wellington Advertiser

While residents in Wellington County are struggling to stave off a number of wind farm projects in their communities, their counterparts in the United States are facing the same battles and arguing with the same tools.

The difference is that here the provincial government has taken away the rights of county and municipal governments to have a say in the process, whereas in the United States, counties still have authority and control over wind farms.

An example of that is Adams County in Illinois, which recently received a report from a real estate appraiser for Adams County. Michael McCann submitted an 82 page report of 21,098 words to county council outlining the difficulties setting setbacks, as well as the loss of property values and possibility of illness that have been associated with wind farms. His report was sworn under oath.

Agency to probe turbine impact : http://www.windaction.org/news/29130

"It's about the industrialization of the area," said Gail Kenney. "We're living in an industrial wind plant, with the noise and lighting -- all those issues and many more." If they win their appeal, it could eventually make it difficult for wind generation companies to find new locations to set up their projects.

September 15, 2010 by Paul Schliesmann in Kingston Whig Standard

A Wolfe Island couple's upcoming property assessment hearing could jeopardize the future of wind turbine projects across Ontario.

Gail and Ed Kenney have been granted a potentially precedent-setting date with the Ontario Assessment Review Board in November to argue that their property has been devalued by nearby wind turbines.

"It's about the industrialization of the area," said Gail Kenney. "We're living in an industrial wind plant, with the noise and lighting -- all those issues and many more."

If they win their appeal, it could eventually make it difficult for wind generation companies to find new locations to set up their projects.

At the very least, a victory could mean a loss of tax assessment for municipalities where wind farms are located.

"There are 86 wind turbines on Wolfe Island," said John Andrew, a commercial real estate specialist in the School of Urban and Regional Planning at Queen's University.

"Any turbine might potentially affect a dozen... *[continue via Web link]*
http://www.thewhig.com/ArticleDisplay.aspx?e=27572...

Fundraising drive on for wind farm health study:
http://www.abc.net.au/news/stories/2010/10/08/3033097.htm

A South Australian GP has launched a fundraising effort to sponsor western Victorian-based research into the health effects of wind farms.

Some residents near the Waubra wind farm, west of Ballarat, have complained that the noise from the turbines is affecting their health.

Dr Sarah Laurie says she started the Waubra Foundation because there has been no locally-based research.

"It has been identified in the UK, in France, in Scandinavia and also in North America and Canada. This is not just a Waubra situation; this is happening right across the world," she said.

Meanwhile, a ceremony will mark the start of construction of the Hepburn wind project, near Daylesford.

In the Australia-first project, two wind turbines will be erected at Leonards Hill, which will generate enough power for more than 2,000 homes.

The wind farm is expected to start operating in the middle of next year.

Impacts on sensitive wildlife

Golden Eagles and other sensitive species are present in Eastern San Diego County and northern Baja. Locals have witnessed their presence in Boulevard, McCain Valley and Jacumba. There will be significant and cumulative impacts to Golden Eagles that are supposed to be protected through the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The excerpts of the posting below document Golden Eagles in this cross-border area that can range hundreds of miles.

Golden Eagle Helicopter Survey http://blogs.sandiegozoo.org/blog/2009/03/23/golden-eagle-helicopter-survey/ Posted at 10:12 am March 23, 2009 by James Sheppard *a Postdoctoral Fellow for San Diego Zoo Conservation Research.* (excerpts)

During the second week of March, I participated in a helicopter survey of golden eagles and their nests along the rugged, remote, and spectacular ridges and canyons of the Sierra de Juárez Mountains in Baja California, Mexico. The survey was conducted under the auspices of Sempra Energy, which is obligated by the state government to provide a percentage of their power production through clean and renewable sources....

Sierra Juárez Mountains

Golden eagles can range hundreds of miles while foraging for their food resources, such as rodents and rabbits. Eagles often use mountain ridges to ride the thermal updrafts that sweep up from the valleys and deserts below so as to gain elevation without expending much flying effort. Unfortunately, their propensity to seek out strong winds can bring the birds into proximity with wind farms. Locating golden eagles that maintain large home ranges can be very challenging. Fortunately, golden eagles can be found during the mating season in late winter/early spring as they maintain territories and incubate eggs in clifftop eyries. The remoteness and ruggedness of their habitats often precludes field-based observations of eagles from being conducted by foot or motor vehicle, so many surveys are instead done via helicopter...

 *Golden eagle nest*

The northern section of the survey covered habitat that was mostly barren, jagged rock, but we were able to locate four nests and spot several golden eagles in the less-desolate central and southern sections. We also observed red-tailed hawks and turkey vultures, as well as three distinct herds of bighorn sheep that were grazing among the giant barrel cacti on the steep slopes..."

US FWS Comments on Summit Ridge Wind project: Download File(s): 2010 EFSC ASC Summit Ridge Final Cmts 09-20-10.pdf (346.32 kB)

September 19, 2010 by Nancy Gilbert

Summary: This important report prepared by the U.S. Fish and Wildlife Service Bend Field Office was submitted to the Energy Facility Siting Officer of the Oregon Department of Energy in reference to the proposed Summit Ridge Wind project. The project to be located in Wasco County Oregon, will include up to 87 wind turbines for a total generating capacity of approximately 200 megawatts. It recommends a minimum 6-mile buffer between Golden Eagles and large wind turbines.

Henderson sets hearing on wind farm ban:

http://www.watertowndailytimes.com/article/20101008/NEWS03/310089932

MORATORIUM EXTENDED: Town to take public input Oct. 26 on law prohibiting such commercial projects

HENDERSON — The Town Council is one step closer to being the first municipality in the north country to ban commercial wind towers....

Conclusion

The Boulevard Planning Area is the most heavily targeted /impacted by existing and proposed industrial wind energy projects and their related infrastructure. In addition to the existing 50 MW Kumeyaay Wind, the proposed 200 MW Tule Wind, the proposed 160-300 MW Kumeyaay Wind II and III, the 57 MW Manzanita Wind, the Sunrise Powerlink, the ECO Substation, and numerous MET towers, we have just learned that thousands of acres of highly visible private ranch land in the Jewel Valley and Ribbonwood Road neighborhoods are reportedly in escrow for purchase by ENEL, part of a large multinational energy company.

We need a full Wind Energy Ordinance EIR that covers all aspects of wind energy production both large and small. By relying on individual MUP s for large scale projects, you are subjecting our community, and eventually others, to a repeated project-by-project struggle to ensure that our residents, visitors and resources are protected with adequate noise and setback requirements, using scientific data--not the current self-serving swill that is being produced and promoted by those who profit off of wind energy in one way or another. We are facing well-funded proponents and blindly supportive government mindsets. Our own County government and public health and safety departments should be working for us--not for these well-heeled opportunistic carpet baggers.

San Diego County should a consider a moratorium on industrial wind energy projects until the science based public health and safety studies, being called for by communities world-wide, are completed.

Sincerely,

/s/

Donna Tisdale, Chair

619-766-4170

donnatisdale@hughes.net

EXHIBIT 1

CALL FOR NOMINATIONS: 2011 BOARD OF DIRECTORS—SEE PAGE 39

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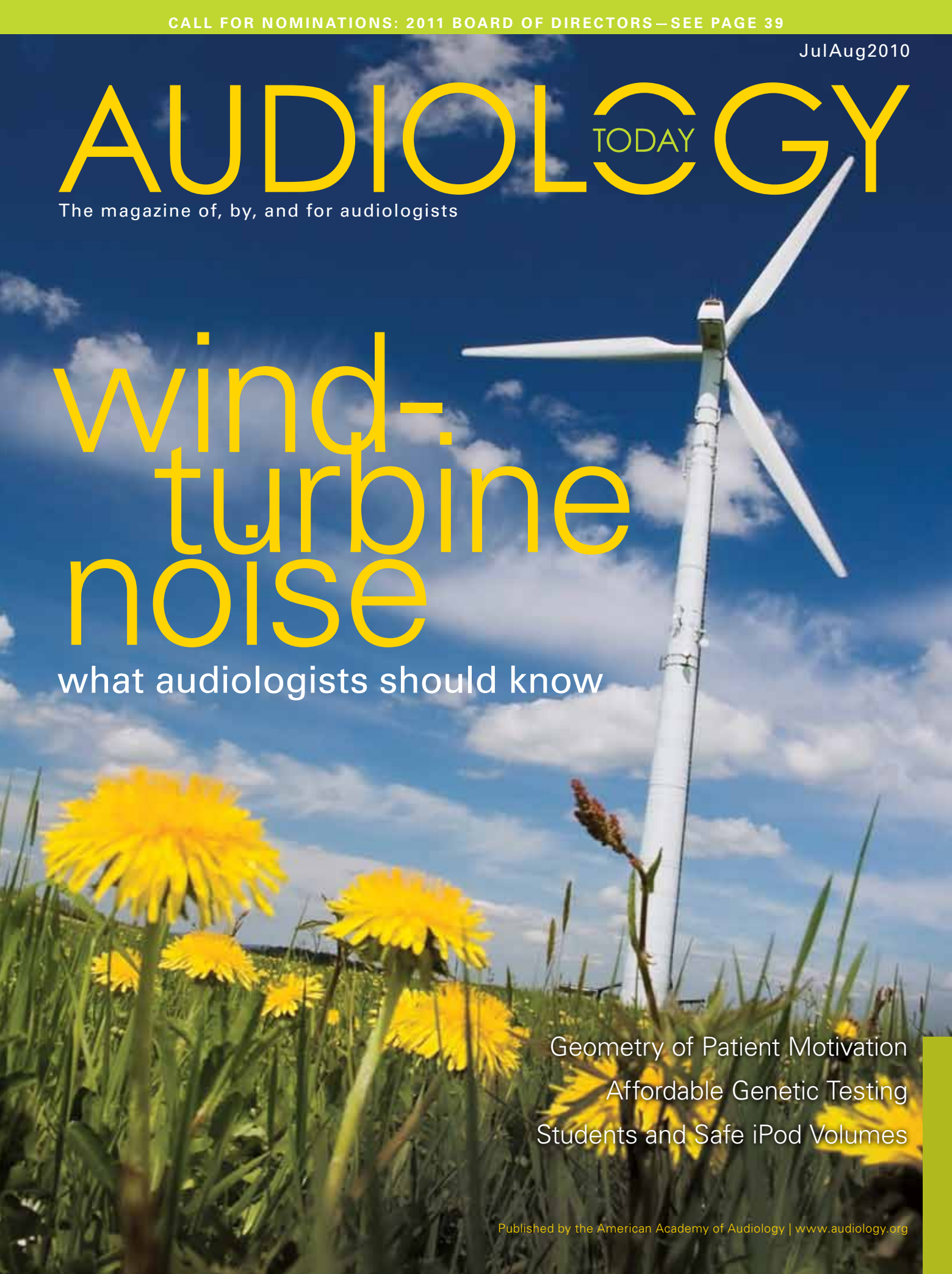
AUDIOLOGY TODAY

The magazine of, by, and for audiologists



wind-turbine noise

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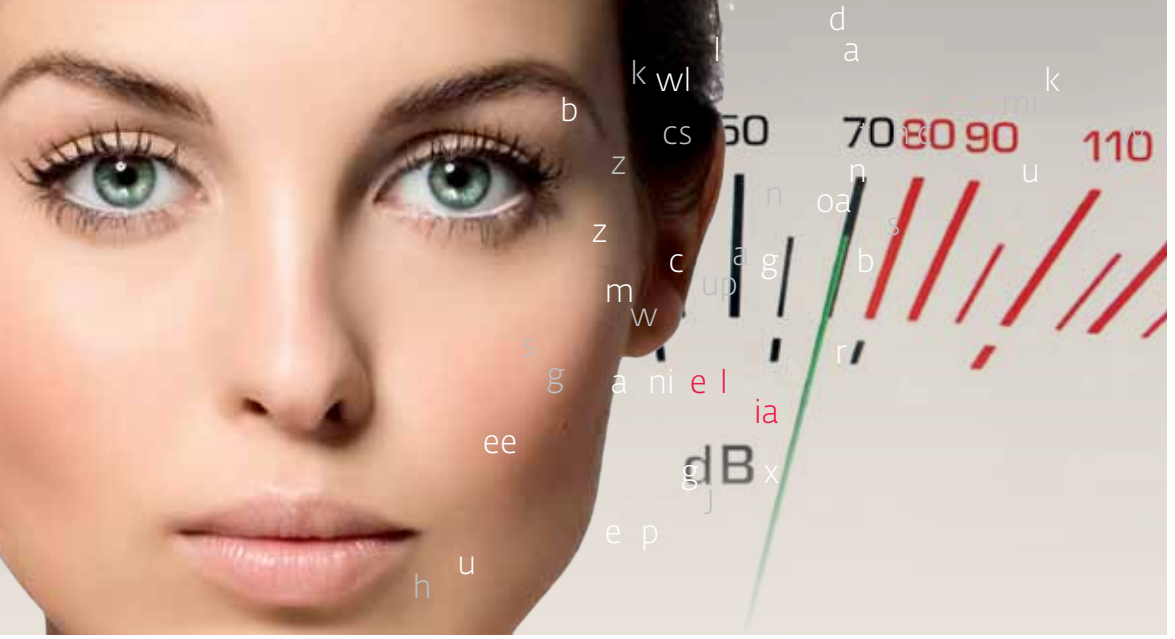

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DEPARTMENTS

Academy News

EDITORIAL MISSION

The American Academy of Audiology publishes *Audiology Today* (*AT*) as a means of communicating information among its members about all aspects of audiology and related topics.

AT provides comprehensive reporting on topics relevant to audiology, including clinical activities and hearing research, current events, news items, professional issues, individual-institutional-organizational announcements, and other areas within the scope of practice of audiology.

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AUDIOLOGY TODAY

The American Academy of Audiology promotes quality hearing and balance care by advancing the profession of audiology through leadership, advocacy, education, public awareness, and support of research.

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AMERICAN ACADEMY OF AUDIOLOGY

A 2020 Strategic-Thinking Board

I am honored to serve as your president

this year. Cheryl Kreider Carey, CAE, the Academy's executive director, and I recently attended a leadership training conference in San Francisco, and one of the many things we heard was that strategic thinking by boards of directors is three dimensional: *oversight*, *insight*, and *foresight*.

Oversight for the Academy will involve, among other things, continually working with our board and Finance Committee to ensure that the Academy remains a viable organization. Be sure to read Cheryl's article in this issue of *AT* for more information.

Insight has already begun via Project Audiology: 2020 Vision, which involved over 300 members who participated in think tanks throughout the United States, including Puerto Rico. The purpose of the think tanks was to seek guidance from members from a number of geographic areas, practice settings, and years in the profession. The Project Audiology: 2020 Vision Task Force analyzed the think tank data, and specific issues identified by participants will be included in the annual membership survey. The think tank data, as well as the membership survey, will inform board leadership as it begins updating the Academy's strategic plan for the future.

Foresight by the board will help ensure a bright future for the Academy and the profession. The Academy has ordered an external scan to be conducted this summer and will inform us of current trends and future issues prior to our strategic planning.

Successful fiduciary responsibility depends significantly on our ability to adapt to a rapidly changing external environment. For the board to have a broad and deep understanding of the current environment as well as what lies ahead, the environmental scan procedure will identify external strengths, weaknesses, opportunities, and threats that potentially may affect our short- and long-term goals.

A comprehensive environmental scan will help forecast industry trends, describe the current workforce, project workforce supply and demand in the future, and identify current and future competencies that will be important for audiologists. Samples of the analysis that may be included in our external scan are sociodemographics, technology, economics, environment, and politics (STEEP). We will keep you posted. So stay tuned!

On another note, the Academy is experiencing some of the same financial challenges that other organizations and citizens are enduring. Stay positive and realize that there will undoubtedly be some short-term sacrifices in the programs that the Academy will be able to provide in the interim. An ancient saying is appropriate at this time: "This too shall pass." AT

Patti Kricos, PhD
President
American Academy of Audiology

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APPLICATION DUE DATE: SEPTEMBER 1, 2010

National Institute for Occupational Safety and Health
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Our New (Financial) Reality

The Academy is facing an unprecedented

reality for the new fiscal year beginning July 1 (ending June 30, 2011). Like most not-for-profit organizations, the economic downturn continues to affect our financial landscape. The evolving ethics discussion in the health-care arena has necessitated additional budget adjustments for the Academy. Providing previously sponsored items at Academy expense, e.g., lanyards at AudiologyNOW!®, has decreased sponsorship revenue and increased expenses. The seven percent decrease in total revenue (since FY08) recently meant tough decisions for the Board of Directors recently in order to approve a balanced budget for FY11.

On a more positive note, projections indicate that FY10's financials (fiscal year ended June 30) could fall safely in the black. This is due in part to proactive measures spearheaded by Treasurer Gary Jacobson, PhD. Three months into FY10, Dr. Jacobson and the Finance Committee requested that I work with senior management to identify yet another round of expenses to cut from the already board-approved FY10 budget. Here are a couple of creative solutions from staff: instead of purchasing stock photography, the communications staff worked with NIDCD to develop a photo shoot of audiologists in action. Since NIDCD retained the credit for each photo, they provided the facilities and photography complimentary. The Academy came away from the partnership with a great assortment of photographs for use in our publications at no cost to the Academy. Additionally, several creative ideas were suggested by the meetings staff without compromising the AudiologyNOW! 2010 experience, e.g., bringing the production of *ProgramNOW!* in house.

To help navigate this new reality, the board is using a tool called the Academy Dashboard, which was just launched this year. A best practice from the association management profession, the dashboard is developed quarterly by our professional staff and provides relevant metrics on key Academy programs/initiatives. Each item is identified with a

- Green dot (on target),
- Yellow dot (lagging behind target), or
- Red dot (at risk).

This tool creates the opportunity for the board to make informed decisions, based on the succinct presentation of key indicators.

It is a board's fiduciary responsibility to keep the

organization viable, and the Academy board is no exception. Remaining resilient through these tough times takes strong leadership committed to the mission and vision of the organization. Know that the Academy's board take their responsibility as financial stewards seriously, and are fully engaged to this end.

Cheryl Kreider Carey, CAE
Executive Director
American Academy of Audiology

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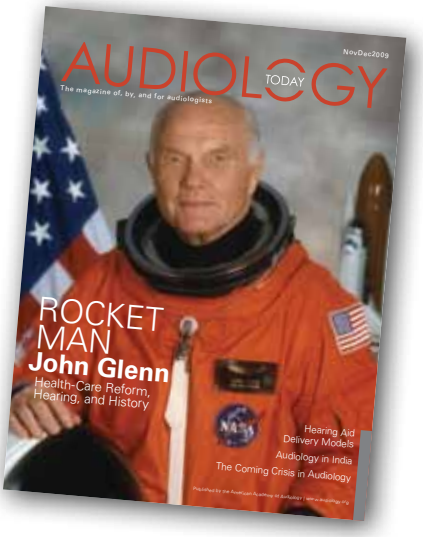
Rising Above the Fray?

Editors are expected to provide editorial comments: Responses to issues or articles with clinical assessment or treatment methods appropriately provide adequate fodder for editorial pieces. The Letters to the Editor section in *Audiology Today* (*AT*) has historically been reserved for readers to submit their opinions about author's articles and for those authors to respond to readers interested in their work—positively or negatively. Referencing the letter to the editor by Fred Rahe, AuD, in the Nov/Dec 2009 issue of *AT*, perhaps the term "academic elite" touched a personal nerve such that Dr. Fabry was unable to appropriately remain above the fray in his role as content editor. I did not consider Dr. Rahe's use of the term "academic elite" to mean anything but a reference to a group rather than a specific individual. The content editor's need to defend Dr. Palmer's positions immediately brings an appropriate question—why is Dr. Palmer not writing her own response to Dr. Rahe's comments? As an avid reader of Letters to the Editor, I have enjoyed comments by readers and responses by authors since *AT* began the this section. I do not recall an issue wherein an editor responded in a manner similar to the recent response to Dr. Rahe by the content editor.

Although it might be considered gallant to spring to the defense of a friend and colleague, I am sure the readership-at-large of *AT* would much rather hear from the author of the article responding to reader's comments and concerns. Perhaps it is time for the content editor to rise above the fray and let the players play.

Robert G. Glaser, PhD



EDITOR'S RESPONSE

Thank you for your letter regarding this article, which provided very stimulating "water cooler" discussion for many audiologists. Consistent with her evidence-based perspective on the topic, Dr. Palmer felt that there was nothing to add beyond what she stated in the article and declined to respond. As content editor, I apologize if it appeared as though Dr. Palmer was not offered that opportunity, or that I was "putting words in her mouth."

David Fabry, PhD
Content Editor, Audiology Today
dfabry@audiology.org

Journal of the
American Academy of Audiology

JAAA ONLINE ENHANCEMENTS IN 2011

As a clinician, researcher, or student in audiology, you need a high-utility tool to access the latest findings in the field. Beginning with the January 2011 issue, *JAAA* will be available in an enhanced HTML format designed to help you find exactly what you need, and find it fast!

Benefits of the new online format will include:

- Robust search capabilities
- Reference linking
- Social bookmarking
- Saved searches and lists
- Environmental friendliness

Hard copies of the journal will no longer be mailed to you in 2011 unless you select this option when renewing. If you choose to receive the hard copy of the journal in 2011, there will be a $12 charge.

TO LEARN MORE ABOUT *JAAA* ONLINE, VISIT WWW.AUDIOLOGY.ORG AND SEARCH KEY WORD "JOURNAL."

AMERICAN ACADEMY OF AUDIOLOGY

Using Newsletters to Stay in Touch

A newsletter is a wonderful way to distribute information to your existing patient base and an excellent way to reach out and market to prospective patients and other professionals regarding the services and products that you provide. A newsletter can be a beneficial and cost-effective investment for your business or organization. Whether you're using a newsletter to boost sales and referrals or to educate readers, you should expect a payback that offsets the costs of publishing and distributing the newsletter.

The payback may be easy to quantify, such as an increase in sales or referrals, or the benefits may be more difficult to measure but equally important, such as increased patient confidence. In either case, a newsletter should generate a return on investment that is worth the cost and time to produce it.

A newsletter can focus the reader on useful or new information, but the goal is to generate results. Articles should be chosen for their ability to attract interest in new products or services or provide answers to frequently asked questions. A newsletter is also a way to advertise any specials, promotions, or seminars that you may be offering in the near future.

Bigger isn't necessarily better. A four-page, 8.5-by-11-inch newsletter is by far the most popular format. However, many companies, especially small practices with limited resources, may not need that much space for their newsletter. Newsletters that fill pages with generic "filler" items such as recipes and famous quotations may be bulky but not effective. Small newsletters, even as little as a page or two, can be just as effective in relaying important and interesting information to your readers. Topics can include information on the latest research, updates on new technology, attendance at conventions or educational programs, new hours, or personal information on staff members.

Newsletters can be created monthly, quarterly, or annually. A quarterly newsletter can provide patients with updated information and yet not require a daunting time commitment. However, some audiologists find it helpful to send shorter, monthly newsletters to keep in touch with their patients. The newsletter can be created using simple software such as Microsoft Publisher, or in some cases, it may be more cost-effective to enlist the services of an outsider to create and publish the newsletter.

In addition to creating the newsletter, accessing your patient database is essential. You may want to send different newsletters to different segments of your patient base. For instance, you may not want to send a newsletter that contains information on a new technology to patients who purchased new aids within the past few months. Or you may want to produce a newsletter for your pediatric patients. The purpose is to keep your patients connected to you and your organization and to let them know that you are keeping abreast of the latest technological and clinical developments.

Ideas for Newsletter Topics

- Hunters and Hearing Loss
- Are Two Hearing Aids Better Than One?
- Nine Out of Ten Consumers Say Hearing Aids Improve Quality of Life
- Open-Ear Hearing Aids: Discreet and Comfortable to Wear
- Bluetooth? What Is It?
- Patient's Perspective
- My Ringing Ears
- Keeping Your Hearing Aids Dry
- Using Good Communication Strategies
- Custom Ear Molds Are Available for a Wide Range of Applications

Starting a Web Site for Your Practice

With increasing numbers of consumers engaged in online commerce, audiology practices need to have an Internet presence and a Web site that will captivate and cultivate business. Not all audiologists or patients are computer savvy, but as the Internet grows in popularity as an avenue for business, having a Web site related to audiology practice has increasingly become a measure of credibility and information for the consuming public, not to mention a powerful marketing tool and source of referrals to expand your patient base.

When you have your own Web site, you have control over the content. This means you can do everything possible to maximize your site for organic search engine optimization. Creativity is helpful in designing a Web site that will hold visitors' attention and cause them to return for future visits. You may decide to share some personal details of your life, such as your background and how your unique qualities contribute to the business. Including photos or interesting facets of the business may also be of interest to current and prospective patients. What you chose to include in your Web site will, in part, depend on the message you are trying to convey. Most important, you will want the Web site to be creative and original enough to set you apart from your competition.

The first step to building a Web site is to do some basic research on Web site creation by professionals specializing in this marketing arena. Doing it yourself may be possible for some—there are plenty of articles and Web sites available for the daring and creative. However, for those who need

additional expertise in design and implementation, Web site development services can prove invaluable in creating a Web site that will captivate visitors. When consulting with these companies about creating your unique site, keep the following in mind:

- Be sure you have a clear understanding about initial design costs and monthly fees to maintain the Web site. Software is available that can make it easy to perform your own monthly maintenance and updates to the Web site.
- Get references of other Web sites the company has created and take time to look them up to get an idea of its previous work.
- Determine how many pages are included in the original package and what's involved in terms of cost and man-hours for updating your site.
- Have photographs of your office and staff ready to provide to the designer. Limit the number of photographs as they will increase the time to load the site.
- Include information that highlights the personal nature, not the size, of your audiology practice. Show how the products or services that you provide have benefited your patients. You may even want to include a page for patient testimonials.
- Remember the basics—your company's name, logo, address, and telephone number should be easy to find, and they should appear on each page of the Web site.
- Check to be certain that preferred keywords such as audiology and hearing aids appear on your home page. This will help ensure that your site is easy for patients to find.
- Make sure the Web site will be identified by all of the major search engines.
- Be sure the text offers concise, easy-to-understand information about what your practice offers. Use visuals to draw visitors in, but don't confuse them with too many words or flashy pictures.
- Personalize your site with links to local and state programs of interest to your patients and links to organizations that may provide more information on hearing loss.
- Ask for a mechanism to track hits on your site. Like all marketing efforts, tracking your Web site's activity will help you determine its usefulness and help justify the cost.

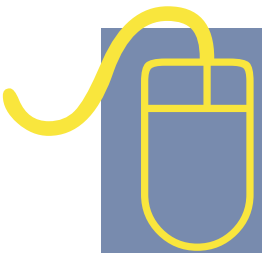
Once the creative portion of the Web site has been completed, you will want to make certain that the finished product is attractive, offers information that is appealing to visitors, and is easy to navigate. However, the job isn't finished because a good Web site requires continual maintenance. Businesses and organizations, whether large or small, need to regularly monitor Web site performance to ensure that opportunities that become available are utilized. Improvements in technology occur constantly. Although Web site development has certainly been simplified, the marketing challenge has become greater as more organizations have recognized the importance of Web marketing and competition has exploded.

Having an effective Web site can be a cost-effective and easy way to advertise an audiology practice. It is not a coincidence that more and more patients are doing business on the Web. Maybe now is the time to reach out to a Web site developer and get more information on how the Web can work for you and your audiology practice. AT

These two short articles are reprinted from the Academy's book, The BEST Guide to Marketing for Audiologists, *edited by Gyl A. Kasewurm, AuD, and the BEST Committee. The book is available through the Academy Store: www.audiology.org/Pages/store.aspx.*

If you have a practice management success story, experience, or idea that you would like to share in an article, send your idea to David Fabry, PhD, content editor for AT, *at dfabry@audiology.org.*

Illustrations by Johanna van der Sterre.



Also of Interest

A variety of practice management resources, including articles, photos, and sample forms, are available on the Academy's Web site.

Log in to www.audiology.org and search key words "resources & tools."

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AMERICAN ACADEMY OF AUDIOLOGY

JULY

15

Have an *AT* article idea?

Send a summary of your idea to David Fabry, PhD, at dfabry@audiology.org.

21

eAudiology Web Seminar—Hearing Aid Reality Check (.2 CEUs)

1:00–3:00 pm ET

www.eaudiology.org

26

Call for Submissions Deadline—Society for Ear, Nose, and Throat Advances in Children (SENTAC) Meeting

www.sentac.org

AUGUST

4

***Audiology Today Enews*, don't miss it in your e-mail every first Wednesday of the month.**

18

eAudiology Web Seminar—Aging and Speech Understanding in Complex Environments (Tier 1) (.3 CEUs)

1:00–4:00 pm ET

www.eaudiology.org

25

Prepare to Celebrate…October Is National Audiology Awareness Month. Visit the Academy's Web site and download resources, tools, and marketing materials.

www.audiology.org/resources/consumer/audiologyawareness

Career and Externship Opportunities Await

Post your rèsumè and search job postings on HEARCareers, the Academy's year-round resource for jobs in audiology. The Academy also offers the Externship Registry, the Academy's site for clinical audiology externships, providing a broad range of clinical experiences with a variety of patient populations.

For more information, visit www.audiology.org and search key words "employment" and "externship."

HIV/AIDS-Related Communication, Hearing, and Swallowing Disorders: Interview with De Wet Swanepoel, PhD

Dr. Swanepoel discusses co-editing his book, *HIV/AIDS-Related Communication, Hearing and Swallowing Disorders*.

Programming Cochlear Implants: Interview with Jace Wolfe, PhD

Dr. Wolfe discusses co-authoring his book, *Programming Cochlear Implants*, FM and Bluetooth, binaural hearing, bilateral cochlear implants, adult and pediatric criteria, and more.

Strategic Practice Management: Interview with Robert G. Glaser, PhD

Dr. Glaser discusses his book, *Strategic Practice Management*, as well as bank loans, business plans, pricing, and more.

Visit www.audiology.org/news and review the latest interviews.

Wind-Turbine NOISE

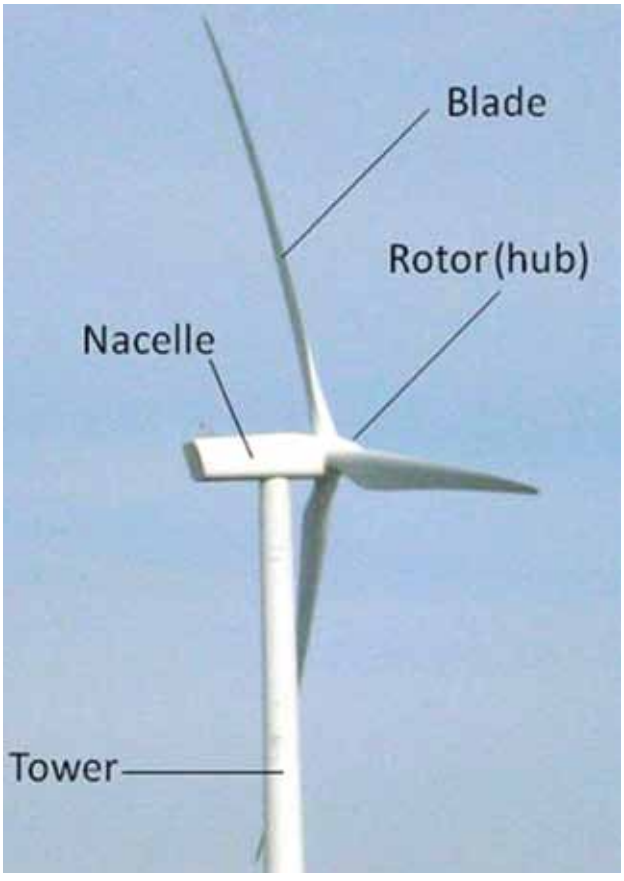
What Audiologists Should Know

BY JERRY PUNCH, RICHARD JAMES, AND DAN PABST

Noise from modern wind turbines is not known to cause hearing loss, but the low-frequency noise and vibration emitted by wind turbines may have adverse health effects on humans and may become an important community noise concern.

Most of us would agree that the modern wind turbine is a desirable alternative for producing electrical energy. One of the most highly touted ways to meet a federal mandate that 20 percent of all energy must come from renewable sources by 2020 is to install large numbers of utility-scale wind turbines. Evidence has been mounting over the past decade, however, that these utility-scale wind turbines produce significant levels of low-frequency noise and vibration that can be highly disturbing to nearby residents.

None of these unwanted emissions, whether audible or inaudible, are believed to cause hearing loss, but they are widely known to cause sleep disturbances. Inaudible components can induce resonant vibration in solids, liquids, and gases—including the ground, houses, and other building structures, spaces within those structures, and bodily tissues and cavities—that is potentially harmful to humans. The most extreme of these low-frequency (infrasonic) emissions, at frequencies under about 16 Hz, can easily penetrate homes. Some residents perceive the energy as sound, others experience it as vibration, and others are not aware of it at all. Research is beginning to show that, in addition to sleep disturbances, these emissions may have other deleterious consequences on health. It is for these reasons that wind turbines are becoming an important community health issue, especially when hosted in quiet rural communities that have no prior experience with industrial noise or urban hum.



Major components of a modern wind turbine.

The people most susceptible to disturbances caused by wind turbines may be a small percentage of the total exposed population, but for them the introduction of wind turbines in their communities is not something to which they can easily become acclimated. Instead, they become annoyed, uncomfortable, distressed, or ill. This problem is increasing as newer utility-scale wind turbines capable of generating 1.5-5 MWatts of electricity or more replace the older turbines used over the past 30 years, which produced less than 1 MWatt of power. These large wind turbines can have hub heights that span the length of a football field and blade lengths that span half that distance. The increased size of these multi-MWatt turbines, especially the blades, has been associated with complaints of adverse health effects (AHEs) that cannot be explained by auditory responses alone.

For this article, we reviewed the English-language, peer-reviewed literature from around the world on the topic of wind-turbine noise and vibration and their effects on humans. In addition, we used popular search engines to locate relevant online trade journals, books, reference sources, government regulations, and acoustic and vibration standards. We also consulted professional engineers and psychoacousticians regarding their unpublished ideas and research.

Sources of Wind-Turbine Noise and Vibration

Physically, a modern wind turbine consists of a tower; a rotor (or hub); a set of rotating blades—usually three, located upwind to the tower; and a nacelle, which is an enclosure containing a gearbox, a generator, and

computerized controls that monitor and regulate operations (FIGURE 1). Wind speed can be much greater at hub level than at ground level, so taller wind towers are used to take advantage of these higher wind speeds. Calculators are available for predicting wind speed at hub height, based on wind speeds at 10 meter weather towers, which can easily be measured directly.

Mechanical equipment inside the nacelle generates some noise, but at quieter levels than older turbines. This mechanical sound is usually considered of secondary importance in discussions of annoyance from today's turbines. The main cause of annoyance is an aerodynamic source created by interaction of the turning blades with the wind. With optimal wind conditions, this aerodynamic noise is steady and commonly described as an airplane overhead that never leaves.

When wind conditions are not optimal, such as during turbulence caused by a storm, the steady sounds are augmented by fluctuating aerodynamic sounds. Under steady wind conditions, this interaction generates a broadband whooshing sound that repeats itself about once a second and is clearly audible. Many people who live near the wind turbine find this condition to be very disturbing.

The whooshing sound comes from variations of air turbulence from hub to blade tip and the inability of the turbine to keep the blades adjusted at an optimal angle as wind direction varies. The audible portion of the whoosh is around 300 Hz, which can easily penetrate walls of homes and other buildings. In addition, the rotating blades create energy at frequencies as low as 1–2 Hz (the blade-passage frequency), with overtones of up to about 20 Hz. Although some of this low-frequency energy is audible to some people with sensitive hearing, the energy is mostly vibratory to people who react negatively to it.

Adverse Health Effects of Wind-Turbine Noise

Hubbard and Shepherd (1990), in a technical paper written for the National Aeronautics and Space Administration (NASA), were the first to report in depth on the noise and vibration from wind turbines. Most of the relevant research since that time has been conducted by European investigators, as commercial-grade (utility-scale) wind turbines have existed in Europe for many decades. Unfortunately, the research and development done by wind-turbine manufacturers is proprietary and typically has not been shared with the public, but reports of the distressing effects on people living near utility-scale wind turbines in various parts of the world are becoming more common.

Studies carried out in Denmark, The Netherlands, and Germany (Wolsink and Sprengers, 1993; Wolsink et al, 1993), a Danish study (Pedersen and Nielsen, 1994), and two Swedish studies (Pedersen and Persson Waye, 2004, 2007) collectively indicate that wind turbines differ from other sources of community noise in several respects. These investigators confirm the findings of earlier research that amplitude-modulated sound is more easily perceived and more annoying than constant-level sounds (Bradley, 1994; Bengtsson et al, 2004) and that sounds that are unpredictable and uncontrollable are more annoying than other sounds (Geen and McCown, 1984; Hatfield et al, 2002).

Annoyance from wind-turbine noise has been difficult to characterize by the use of such psychoacoustic parameters as sharpness, loudness, roughness, or modulation (Persson Waye and Öhrström, 2002). The extremely low-frequency nature of wind-turbine noise, in combination with the fluctuating blade sounds, also means that the noise is not easily masked by other environmental sounds.

Pedersen et al (2009), in a survey conducted in The Netherlands on 725 respondents, found that noise from

wind turbines is more annoying than transportation or industrial noises at comparable levels, measured in dBA. They noted that annoyance from turbine sounds at 35 dBA corresponds to the annoyance reported for other common community-noise sources at 45 dBA. Higher visibility of the turbines was associated with higher levels of annoyance, and annoyance was greater when attitudes toward the visual impact of the turbines on the landscape were negative. However, the height of wind turbines means that they are also most clearly visible to the people closest to them and those who also receive the highest sound levels. Thus, proximity of the receiver to wind turbines makes it difficult to determine whether annoyance to the noise is independent of annoyance to the visual impact. Pedersen et al (2009) also found that annoyance was substantially lower in people who benefitted economically from having wind turbines located on their property.

Among audiologists and acousticians, it has been understood for many decades that sufficiently intense and prolonged exposure to environmental noise can cause hearing impairment, annoyance, or both. In essence, the view has been *what* you can hear can hurt you. In the case of wind turbines, it seems that *what* you can't hear can also hurt you. Again, there is no evidence that noise generated by wind turbines, even the largest utility-scale turbines, causes hearing loss. But there is increasingly clear evidence that audible and low-frequency acoustic energy from these turbines is sufficiently intense to cause extreme annoyance and inability to sleep, or disturbed sleep, in individuals living near them.

Jung and colleagues (2008), in a Korean study, concluded that low-frequency noise in the frequency range above 30 Hz can lead to psychological complaints and that infrasound in the frequency range of 5–8 Hz can cause complaints due to rattling doors and windows in homes.

The energy generated by large wind turbines can be especially disturbing to the vestibular systems of some people, as well as cause other troubling sensations of the head, chest, or other parts of the body. Dr. Nina Pierpont (2009), in her definitive natural experiment on the subject, refers to these effects as Wind-Turbine Syndrome (WTS). TABLE 1 lists the symptoms that, in various combinations, characterize WTS. Although hearing impairment is not one of the symptoms of WTS, audiologists whose patients report these symptoms should ask them if they live near a wind turbine.

It is well known that sleep deprivation has serious consequences, and we know that noncontinuous sounds and nighttime sounds are less tolerable than continuous and daytime sounds. Somewhat related effects, such as cardiac arrhythmias, stress, hypertension, and headaches have also been attributed to noise or vibration from wind turbines, and some researchers are referring to these effects as Vibroacoustic Disease, or VAD (Castelo Branco, 1999; Castelo Branco and Alves-Pereira, 2004). VAD is described as occurring in persons who are exposed to high-level (>90 dB SPL) infra- and low-frequency noise (ILFN), under 500 Hz, for periods of 10 years or more. It is believed to be a systemic pathology characterized by direct tissue damage to a variety of bodily organs and may involve abnormal proliferation of extracellular matrices.

Alves-Pereira and Castelo Branco (2007) reported on a family who lived near wind turbines and showed signs of VAD. The sound levels in the home were less than 60 dB SPL in each 1/3–octave band below 100 Hz. We have measured unweighted sound levels ranging from 60 to 70 dB Leq (averaged over 1 minute) in these low-frequency bands in Ontario homes of people reporting AHEs from wind turbines. A spectral analysis of sounds emitted at a Michigan site revealed that unweighted peak levels at frequencies under 5 Hz exceeded 90 dB SPL (Wade Bray, pers. comm., 2009).

Table 1. Core Symptoms of Wind-Turbine Syndrome

1	Sleep disturbance
2	Headache
3	Visceral Vibratory Vestibular Disturbance (VVVD)
4	Dizziness, vertigo, unsteadiness
5	Tinnitus
6	Ear pressure or pain
7	External auditory canal sensation
8	Memory and concentration deficits
9	Irritability, anger
10	Fatigue, loss of motivation

Source: Pierpont, 2009

Similar observations have been made in studies of people who live near busy highways and airports, which also expose people to low-frequency sounds, both outdoors and in their homes. Evidence is insufficient to substantiate that typical exposures to wind-turbine noise, even in residents who live nearby, can lead to VAD, but early indications are that there are some more-vulnerable people who may be susceptible. Because ILFN is not yet recognized as a disease agent, it is not covered by legislation, permissible exposure levels have not yet been established, and dose-response relationships are unknown (Alves-Pereira, 2007).

As distinguished from VAD, Pierpont's (2009) use of the term Wind-Turbine Syndrome appears to emphasize a constellation of symptoms due to stimulation, or overstimulation, of the vestibular organs of balance due to ILFN from wind turbines (see TABLE 1). One of the most distinctive symptoms she lists in the constellation of symptoms comprising WTS is Visceral Vibratory Vestibular Disturbance (VVVD), which she defines as "a sensation of internal quivering, vibration, or pulsation accompanied by agitation, anxiety, alarm, irritability, rapid heartbeat, nausea, and sleep disturbance" (p. 270).

Drawing on the recent work of Balaban and colleagues (i.e., Balaban and Yates, 2004), Pierpont describes the close association between the vestibular system and its neural connections to brain nuclei involved with balance processing, autonomic and somatic sensory inflow and outflow, the fear and anxiety associated with vertigo or a sudden feeling of postural instability, and aversive learning. These neurological relationships give credence to Pierpont's linkage of the symptoms of VVVD to the vestibular system.

Todd et al (2008) demonstrated that the resonant frequency of the human vestibular system is 100 Hz, concluding that the mechano-receptive hair cells of the vestibular structures of the inner ear are remarkably sensitive to low-frequency vibration and that this sensitivity to vibration exceeds that of the cochlea. Not only is 100 Hz the frequency of the peak response of the vestibular system to vibration, but it is also a frequency at which a substantial amount of acoustic energy is produced by wind turbines. Symptoms of both VAD and VVVD can presumably occur in the presence of ILFN as a result of disruptions of normal paths or structures that mediate the fine coordination between living tissue deformation and activation of signal transducers; these disruptions can lead to aberrant mechano-electrical coupling that can, in turn, lead to conditions such as heart arrhythmias (Ingber, 2008). Ultimately, further research will be needed to sort out the commonalities and differences among the symptoms variously described in the literature as VAD, VVVD, and WTS.

Dr. Geoff Leventhall, a British scientist, and his colleagues (Waye et al, 1997; Leventhall, 2003, 2004) have documented the detrimental effects of low-frequency noise exposure. They consider it to be a special environmental noise, particularly to sensitive people in their homes. Waye et al (1997) found that exposure to dynamically modulated low-frequency ventilation noise (20–200 Hz)—as opposed to midfrequency noise exposure—was more bothersome, less pleasant, impacted work performance more negatively, and led to lower social orientation.

Leventhall (2003), in reviewing the literature on the effects of exposure to low-frequency noise, found no evidence of hearing loss but substantial evidence of vibration of bodily structures (chest vibration), annoyance (especially in homes), perceptions of unpleasantness (pressure on the eardrum, unpleasant perception within the chest area, and a general feeling of vibration), sleep disturbance (reduced wakefulness), stress, reduced performance on demanding

verbal tasks, and negative biological effects that included quantitative measurements of EEG activity, blood pressure, respiration, hormone production, and heart rate.

Regarding work performance, reviewed studies indicated that dynamically modulated low-frequency noise, even when inaudible to most individuals, is more difficult to ignore than mid- or high-frequency noise and that its imperviousness to habituation leads to reduced available information-processing resources. Leventhall hypothesized that low-frequency noise, therefore, may impair work performance. More recently, as a consultant on behalf of the British Wind Energy Association (BWEA), the American Wind Energy Association (AWEA), and the Canadian Wind Energy Association (CANWEA), Leventhall (2006) changed his position, stating that although wind turbines do produce significant levels of low-frequency sound, they do not pose a threat to humans—in effect reverting to the notion that *what* you can't hear can't hurt you.

According to the World Health Organization guidelines (WHO, 2007), observable effects of nighttime, outdoor wind-turbine noise do not occur at levels of 30 dBA or lower. Many rural communities have ambient, nighttime sound levels that do not exceed 25 dBA. As outdoor sound levels increase, the risk of AHEs also increases, with the most vulnerable being the first to show its effects. Vulnerable populations include elderly persons; children, especially those younger than age six; and people with pre-existing medical conditions, especially if sleep is affected. For outdoor sound levels of 40 dBA or higher, the WHO states that there is sufficient evidence to link prolonged exposure to AHEs. While the WHO identifies long-term, nighttime audible sounds over 40 dBA outside one's home as a cause of AHEs, the wind industry commonly promotes 50 dBA as a safe limit for nearby homes and properties. Recently, a limit of 45 dBA has been proposed for new wind projects in Canada (Keith et al, 2008).

Utility-scale wind turbines located in Huron County, Michigan.

Much of the answer as to why the wind industry denies that noise is a serious problem with its wind turbines is because holding the noise to 30 dBA at night has serious economic consequences. The following quotation by Upton Sinclair seems relevant here: "It is difficult to get a man to understand something when his salary depends upon his not understanding it" (Sinclair, 1935, reprinted 1994, p. 109).

In recent years, the wind industry has denied the validity of any noise complaints by people who live near its utility-scale wind turbines. Residents who are leasing their properties for the siting of turbines are generally so pleased to receive the lease payments that they seldom complain. In fact, they normally are required to sign a leasing agreement, or gag clause, stating they will not speak or write anything unfavorable about the turbines. Consequently, complaints, and sometimes lawsuits, tend to be initiated by individuals who live near property on which wind turbines are sited, and not by those who are leasing their own property. This situation pits neighbor against neighbor, which leads to antagonistic divisions within communities.

Measurement of Wind-Turbine Noise

It is important to point out that the continued use of the A-weighting scale in sound-level meters is the basis for misunderstandings that have led to acrimony between advocates and opponents of locating wind turbines in residential areas. The dBA scale grew out of the desire to incorporate a function into the measurement of sound pressure levels of environmental and industrial noise that is the inverse of the minimum audibility curve (Fletcher and Munson, 1933) at the 40-phon level. It is typically used, though, to specify the levels of noises that are more intense, where the audibility curve becomes considerably flattened, obviating the need for A-weighting. It is mandated in various national and international standards for measurements that are compared to damage-risk criteria for hearing loss and other health effects. The A-weighted scale in sound-level meters drastically reduces

sound-level readings in the lower frequencies, beginning at 1000 Hz, and reduces sounds at 20 Hz by 50 dB.

For wind-turbine noise, the A-weighting scale is especially ill-suited because of its devaluation of the effects of low-frequency noise. This is why it is important to make C-weighted measurements, as well as A-weighted measurements, when considering the impact of sound from wind turbines. Theoretically, linear-scale measurements would seem superior to C-scale measurements in wind-turbine applications, but linear-scale measurements lack standardization due to failure on the part of manufacturers of sound-level meters to agree on such factors as low-frequency cutoff and response tolerance limits. The Z-scale, or zero-frequency weighting, was introduced in 2003 by the International Electro-technical Commission (IEC) in its Standard 61672 to replace the flat, or linear, weighting used by manufacturers in the past.

State of Michigan Siting Guidelines

Michigan's siting guidelines (State of Michigan, 2008) will be used as an example of guidelines that deal only in a limited way with sound. These guidelines refer to earlier, now outdated, WHO and Environmental Protection Agency (EPA) guidelines to support a noise criterion that SPLs cannot exceed 55 dBA at the adjacent property line. This level is allowed to be exceeded during severe weather or power outages, and when the ambient sound level is greater than 55 dBA, the turbine noise can exceed that higher background sound level by 5 dB. These levels are about 30 dB above the nighttime levels of most rural communities. When utility-scale turbines were installed in Huron County, Michigan, in May 2008, the WHO's 2007 guidelines that call for nighttime, outside levels not to exceed 30 dBA were already in place. Based on measurements made by the authors, these turbines produce 40–45 dBA sound levels at the perimeter of a 1,000 ft radius under typical weather conditions, and the additive effects of multiple turbines produce higher levels. Many of the turbines have been located close enough to homes to produce very noticeable noise and vibration.

Kamperman and James (2009) have offered recommendations for change in the State of Michigan guidelines (2008) for wind turbines. Some of the more pertinent details of the Michigan siting guidelines are shown in the left-hand column of TABLE 2. The state of Michigan permits sound levels that do not exceed 55 dBA or L90 + 5 dBA, whichever is greater, measured at the property line closest to the wind-energy system. These guidelines make no provisions to limit low-frequency sounds from wind-turbine operations.

In consideration of the current WHO guidelines (2007), measurements made by the authors in Huron County, Michigan, indicate that the current Michigan guidelines do not appear adequate to protect the public from the nuisances and known health risks of wind-turbine noise. In fact, these guidelines appear to be especially lenient

Table 2. Current and Proposed Wind-Turbine Siting Guidelines

Current Michigan Guidelines*	Alternative Proposed Guidelines**
Sound level cannot exceed 55 dBA or L90 + 5 dBA, whichever is greater.	Operating LAeq is not to exceed the background LA90 +5 dBA, where LA90 is measured during a preconstruction noise study at the quietest time of night. Similar dBC limits should also be applied.
Limits apply to sound levels measured at homes (as stated in Huron County Ordinance).	Limits apply to sound levels measured at property lines, except that turbine sounds cannot exceed 35 dBA at any home.
No provisions are made for limiting low-frequency sounds from wind-turbine operations.	LCeq-LA90 cannot exceed 20 dB at receiving property, e.g., LCeq (from turbines) minus (LA90 [background] + 5) < 20 dB, and is not to exceed 55 LCeq from wind turbines (60 LCeq for properties within one mile of major heavily trafficked roads).

*Source: State of Michigan, 2008

**Source: Kamperman and James, 2009

in terms of tolerable sound levels. Sound levels that approach 20 dBA higher than natural ambient levels are considered unacceptable in most countries; Michigan permits 30 dBA increases.

In considering the health and well-being of people living near wind-turbine projects, the changes recommended by Kamperman and James (2009) would abandon the 55 dBA limit in favor of the commonly accepted criteria of L90 + 5 dBA, for both A- and C-scale readings, where L90 is the preconstruction ambient level. These recommendations also include a prohibition against any wind-turbine-related sound levels exceeding 35 dBA on receiving properties that include homes or other structures in which people sleep. Additional protections against low-frequency sound are given in the right-hand column of TABLE 2. These recommended provisions would protect residents by limiting the difference between C-weighted Leq during turbine operation and the quietest A-weighted pre-operation background sound levels, plus 5 dB, to no more than 20 dB at the property line. This level should not exceed 55 dB Leq on the C scale, or 60 dB Leq for properties within one mile of major heavily trafficked roads, which sets a higher tolerance for communities that tend to experience slightly noisier conditions.

People living near wind turbines may experience sleep disturbance.

Implementation of the recommendations of Kamperman and James would result in siting wind turbines differently than what is currently planned for future wind-turbine projects in Michigan. This change would result in sound levels at nearby properties that are much less noticeable, and much less likely to cause sleep deprivation, annoyance, and related health risks. These sound-level measurements should be made by independent acoustical engineers or knowledgeable audiologists who follow ANSI guidelines (1993, 1994) to ensure fair and accurate readings, and not by representatives of the wind industry.

People living within a mile of one or more wind turbines, and especially those living within a half mile, have frequent sleep disturbance leading to sleep deprivation, and sleep disturbances are common in people who live up to about 1.25 miles away. This is the setback distance at which a group of turbines would need to be in order not to be a nighttime noise disturbance (Kamperman and James, 2009). It is also the setback distance used in several other countries that have substantial experience with wind turbines, and is the distance at which Pierpont (2009) found very few people reporting AHEs.

A study conducted by van den Berg (2003) in The Netherlands demonstrated that daytime levels cannot be used to predict nighttime levels and that residents within 1900 mile (1.18 mile) of a wind-turbine project expressed annoyance from the noise. Pierpont (2009) recommends baseline minimum setbacks of 2 kilometers (1.24 mile) from residences and other buildings such as hospitals, schools, and nursing homes, and longer setbacks in mountainous terrain and when necessary to meet the noise criteria developed by Kamperman and James (2009).

In a panel review report, the American Wind Energy Association (AWEA) and Canadian Wind Energy Association (CANWEA) have objected to setbacks that exceed 1 mile (Colby et al, 2009). A coalition of independent medical and acoustical experts, the Society for Wind Vigilance (2010), has provided a recent rebuttal to that report. The society has described the panel review as a typical product of industry-funded white papers, being neither authoritative nor convincing. The society accepts as a medical fact that sleep disturbance, physiological stress, and psychological distress can result from exposure to wind-turbine noise.

Wind turbines have different effects on different people. Some of these effects are somewhat predictable based on financial compensation, legal restrictions on free speech included in the lease contracts with hosting landowners, and distance of the residence from wind projects, but they are sometimes totally unpredictable. Planning for wind projects needs to be directed not only toward benefitting society at large but also toward protecting the individuals living near them. We believe that the state of Michigan, and other states that have adopted similar siting guidelines for wind turbines, are not acting in the best interest of all their citizens and need to revise their siting guidelines to protect the public from possible health risks and loss of property values, as well as reduce complaints about noise annoyance.

Wind-utility developers proposing new projects to a potential host community are often asked if their projects will cause the same negative community responses that are heard from people living in the footprint of operating projects. They often respond that they will use a different

type of wind turbine or that reports of complaints refer to older-style turbines that they do not use. In our opinion, these statements should usually be viewed as diversionary.

Finally, it is important to note that there is little difference in noise generated across makes and models of modern utility-scale, upwind wind turbines once their power outputs are normalized. Kamperman (pers. comm., 2009), after analyzing data from a project funded by the Danish Energy Authority (Søndergaard and Madsen, 2008), has indicated that when the A-weighted sound levels are converted to unweighted levels, the low-frequency energy from industrial wind turbines increases inversely with frequency at a rate of approximately 3 dB per octave to below 10 Hz (the lowest reported frequency). Kamperman has concluded that the amount of noise generated at low frequencies increases by 3–5 dB for every MW of electrical power generated. Because turbines are getting larger, this means that future noise problems are likely to get worse if siting guidelines are not changed.

Conclusion

Our purpose in this article has been to provide audiologists with a better understanding of the types of noise generated by wind turbines, some basic considerations underlying sound-level measurements of wind-turbine noise, and the adverse health effects on people who live near these turbines. In future years, we expect that audiologists will be called upon to make noise measurements in communities that have acquired wind turbines, or are considering them. Some of us, along with members of the medical profession, will be asked to provide legal testimony regarding our opinions on the effects of such noise on people. Many of us will likely see clinical patients who are experiencing some of the adverse health effects described in this article.

As a professional community, audiologists should become involved not only in making these measurements to corroborate the complaints of residents living near wind-turbine projects but also in developing and shaping siting guidelines that minimize the potentially adverse health effects of the noise and vibration they generate. In these ways, we can promote public health interests without opposing the use of wind turbines as a desirable and viable alternative energy source.

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References

Alves-Pereira M, Castelo Branco NAA. (2007) In-home wind-turbine noise is conducive to Vibroacoustic Disease. Paper presented at Second International Meeting on Wind-Turbine Noise, Lyon, France.

American National Standards Institute (ANSI) (1993) *ANSI Standard S12.9, Part 3—1993 (R 2008)*. Quantities and procedures for description and measurement of environmental sound, Part 3, Short-term measurements with an observer present. New York: American National Standards Institute.

American National Standards Institute (ANSI) (1994) *ANSI Standard S12.18—1994 (R 2009)*. Outdoor measurement of sound pressure level. New York: American National Standards Institute.

Balaban CD, Yates BJ. (2004) The vestibuloautonomic interactions: a telologic perspective. In: Highstein SM, Fay RR, Popper AN, eds. *The Vestibular System*. New York: Springer-Verlag, 286–342.

Bengtsson J, Persson Waye K, Kjellberg A. (2004) Sound characteristics in low frequency noise and their relevance for the perception of pleasantness. *Acta Acust* 90:171–180.

Bradley JS. (1994) Annoyance caused by constant-amplitude and amplitude-modulated sound containing rumble. *Noise Control Eng J* 42:203–208.

Castelo Branco NAA. (1999) The clinical stages of vibroacoustic disease. *Aviation, Space, Env Med* 70(3):32–39.

Castelo Branco NAA, Alves-Pereira M. (2004) Vibroacoustic disease. *Noise Health* 6(23):3–20.

Colby WD, Dobie R, Leventhall G, Lipscomb DM, McCunney RJ, Seilo MT. (December 2009) "Wind-Turbine Sound and Health Effects: An Expert Panel Review." Prepared for the American Wind Energy Association and Canadian Wind Energy Association.

Fletcher H, Munson WA. (1933) Loudness, its definition, measurement and calculation. *J Acoust Soc Am* 5:82–108.

Geen RG, McCown EJ. (1984) Effects of noise and attack on aggression and physiological arousal. *Motivat Emot* 8:231–241.

Hatfield J, Job RF, Hede AJ, Carter NL, Peploe P, Taylor R, et al (2002). Human response to environmental noise: the role of perceived control. *J Behav Med* 9:341–359.

Hubbard HH, Shepherd KP. (1990) Wind Turbine Acoustics, NASA Technical Paper 3057 DOE/NASA/20320–77, National Aeronautics and Space Administration.

Ingber DE. (2008) Tensegrity-based mechanosensing from macro to micro. *Prog Biophys Molec Biol* 97:163–179.

Kamperman G, James R. (2009) Guidelines for selecting wind-turbine sites. *J Sound Vib* 43(7):8–11.

Keith SE, Michaud DS, Bly SHP. (2008) A proposal for evaluating the potential health effects of wind-turbine noise for projects under the Canadian Environmental Assessment Act. *J Low Freq Noise, Vib and Active Control* 27:253–265.

Jung SS, Cheung W, Cheong C, Shin S. (2008) Experimental identification of acoustic emission characteristics of large wind turbines with emphasis on infrasound and low-frequency noise. *J Korean Phy Soc* 53:1897–1905.

Leventhall G. (2003) A Review of Published Research on Low Frequency Noise and its Effects. Defra Report. London: Department for Environment, Food and Rural Affairs.

Leventhall G. (2004) Low frequency noise and annoyance. *Noise Health* 6(23):59–72.

Leventhall G. (2006) Infrasound from wind turbines—fact, fiction or deception. *Canad Acoust* 34(2):29–36.

Pedersen E, Persson Waye K. (2004) Perception and annoyance due to wind turbine noise: a dose–response relationship. *J Acoust Soc Am* 116:3460–3470.

Pedersen E, Persson Waye K. (2007) Wind turbine noise, annoyance and self-reported health and wellbeing in different living environments. *Occup Env Med* 64:480–486.

Pedersen E, van den Berg F, Bakker R, Bouma J. (2009) Response to noise from modern wind farms in The Netherlands. *J Acoust Soc Am* 126:634–643.

Pedersen TH, Nielsen KS. (1994) Genvirkning af støj fra vindmøller (Annoyance by noise from wind turbines). Report No. 150, DELTA Acoustic and Vibration, Lydtekniske Institute, Copenhagen.

Persson Waye K, Öhrström E. (2002) Psycho-acoustic characters of relevance for annoyance of wind turbine noise. *J Sound Vib* 250(1):65–73.

Pierpont, N. (2009) Wind-Turbine Syndrome: a report on a natural experiment. Santa Fe, NM: K-Selected Books.

Sinclair U. (1935) I, candidate for governor: and how I got licked. New York: Farrar and Rinehart. (Reprinted, Berkeley, CA: University of California Press, 1994.)

Søndergaard B, Madsen KD. (2008) Low frequency noise from large wind turbines: summaries and conclusions on measurements and methods. EFP-06 Project, DELTA Danish Electronics, Light and Acoustics.

State of Michigan. (2008) Sample zoning for wind energy systems. http://www.michigan.gov/documents/dleg/WindEnergySampleZoning_236105_7.pdf (accessed December 2, 2009).

The Society for Wind Vigilance. (2010) An Analysis of the American/Canadian Wind Energy Association Sponsored "Wind-Turbine Sound and Health Effects: An Expert Panel Review, December 2009." http://windconcernsontario.wordpress.com/2010/01/10/media-release-the-society-for-wind-vigilance/ (accessed January 12, 2010).

Todd NPM, Rosengren SM, Colebatch JG. (2008) Tuning and sensitivity of the human vestibular system to low-frequency vibration. *Neurosci Lett* 444:36–41.

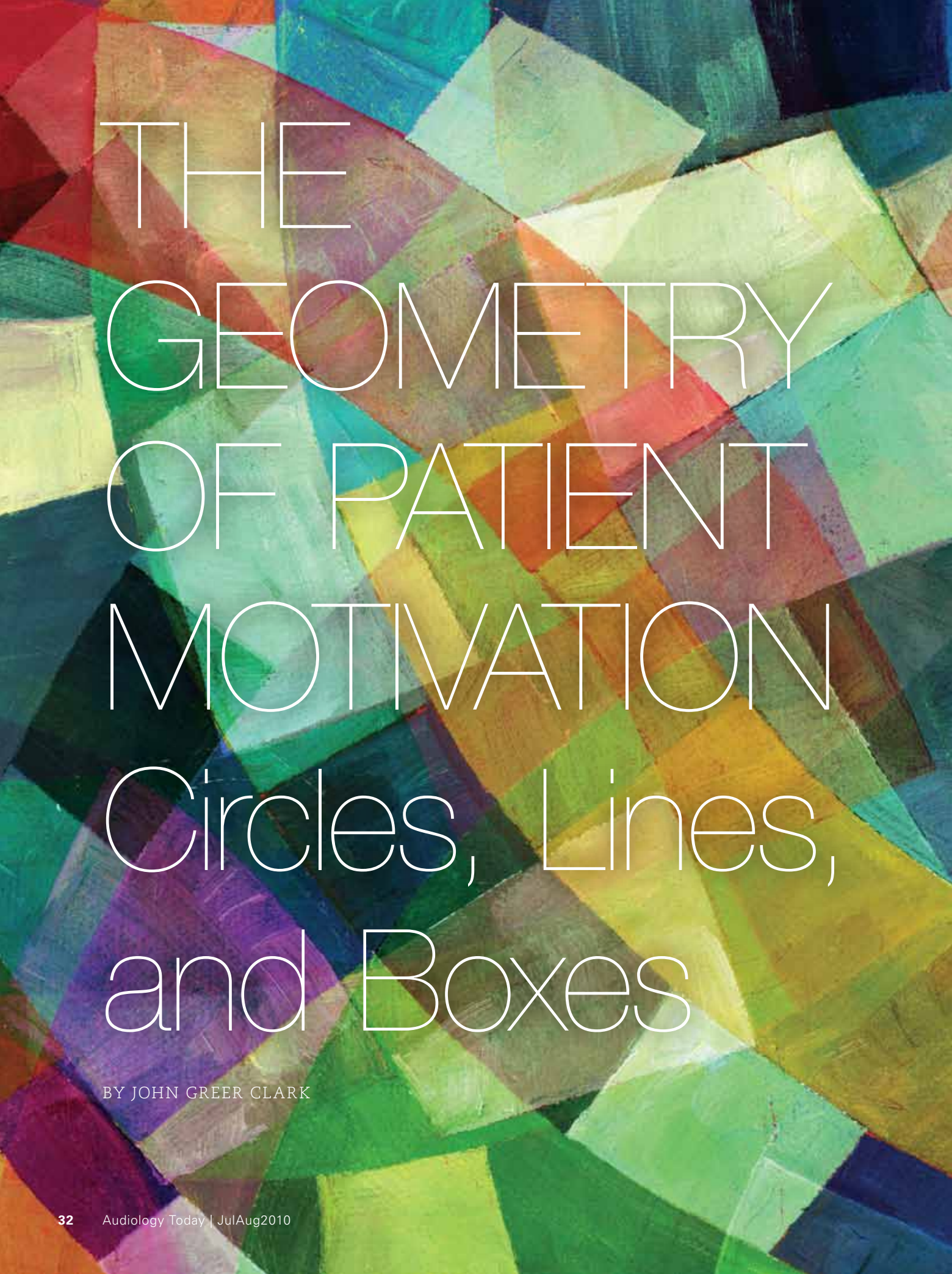
van den Berg GP. (2003) Effects of the wind profile at night on wind-turbine sound. *J Sound Vib* 277(4–5):955–970.

Waye KP, Rylander R, Benton S, Leventhall G. (1997) Effects on performance and work quality due to low frequency ventilation noise. *J Sound Vib* 205(4):467–474.

Wolsink M, Sprengers M. (1993) Wind turbine noise: a new environmental threat? Proceedings of the Sixth International Congress on the Biological Effects of Noise, ICBEN, Nice, France, 2, 235–238.

Wolsink M, Sprengers M, Keuper A, Pedersen TH, Westra CA. (1993) Annoyance from wind turbine noise on sixteen sites in three countries. Proceedings of the European Community Wind Energy Conference, Lübeck, Travemünde, 273–276.

World Health Organization (WHO) (2007) *Night Noise Guidelines* (NNGL) for Europe: Final Implementation Report. World Health Organization, Regional Office for Europe, Bonn Office.



THE GEOMETRY OF PATIENT MOTIVATION

Circles, Lines, and Boxes

BY JOHN GREER CLARK

This article relays a set of simple tools represented by three geometric symbols that, with a little practice, audiologists can use effectively to help patients build their own internal motivation for hearing help.

It has long been recognized in health-care arenas that change does not occur without motivation for that change. This holds true when dealing with substance abuse issues, medication compliance, eating disorders, change in diet, smoking cessation, exercise regimens, or any host of health-related issues. Audiologists have also long recognized that patient motivation is a key to one's acceptance of hearing care recommendations.

Frequently, audiologists find themselves going to great lengths to develop ways of motivating their patients toward action. We often counter patient resistance to our recommendations with discussions of the patient's audiogram and the implications of measured hearing deficits on speech reception. Often, we will provide third-party stories of successful patients who had once questioned if they needed amplification, yet who are now quite successful hearing aid users. We may use hearing manufacturer marketing slicks that employ celebrity endorsements to support a product. We may even embrace the age-old sales tactics of financial inducements, offering limited time discounts or savings with binaural fittings. In spite of our efforts, we often find that reluctant patients operate on their own internal timetable and are only ready to proceed when they feel the necessity. Like our patients' family members, we are at times baffled that these patients do not seem to acknowledge the same communication frustrations and urgency for action that seem so apparent to others.

In actuality, clinicians can only set the stage for patients to find their own internal motivation to tackle the tasks required to achieve desired goals. It becomes the audiologist's role to help patients recognize the negative impact of untreated hearing loss and to articulate their own reasons for change. As we might recognize from our personal life experiences, motivation that arises from within oneself is far more sustainable and leads to far greater successes than motivation that another person attempts to instill within us.

The need for audiologists to successfully kindle patients' internal motivation has been a recent topic in audiologic literature (Harvey, 2003; Beck et al 2007; Beck and Harvey, 2009) and in a series of interactive workshops for hearing health professionals (idainstitute.com). The purpose of this article is to relay a set of simple tools represented by three geometric symbols that, with a little practice, audiologists can use effectively to help patients build their own internal motivation for hearing help.

Setting the Stage

Theodore Roosevelt said, "People don't care what you know until they know that you care." Toward this end, the manner in which we attend to our patients' needs, draw out their stories, and provide a true listening rooted in understanding is critical to setting the stage for successful engagement and the attainment of clinical goals (Clark, 2008). Patients present various levels of readiness to engage within the clinical process. It is our challenge and goal to help them to find, when lacking, the internal motivation to accept our recommendations and move forward.

More than a quarter of a century ago, Goldstein and Stevens (1981) presented four postures of readiness toward hearing loss management that patients may bring to the clinic. Those in the first posture, representing the vast majority of the patients coming for audiological services, are generally positive toward rehabilitation and ready to work with the audiologist. Those holding the second position in the Goldstein and Stevens categorization also bring a positive outlook toward hearing loss intervention but may present a complicating factor (e.g., a hearing loss that may be difficult to fit with hearing aids or a concomitant complicating health condition). While those with the third posture may be generally negative toward

the idea of hearing rehabilitation, they demonstrate a willingness to work within the process. Audiologists are fortunate that those holding forth this third posture, and those of the fourth posture, who present an open rejection of hearing aids and hearing rehabilitation, constitute the minority of the patients we see. Those in these latter two groups present our greatest challenges and our greatest disappointments, as they frequently depart from the clinical visit without committing to the steps they must take and their family members strongly desire. It is for these latter two groups of patients that motivational engagement strategies are most useful.

Audiologists must combat common human emotions and behaviors that may adversely impact the services they deliver.

Audiologists, just as other health-care professionals, must combat common human emotions and behaviors that may adversely impact the services they deliver. We frequently see patients with long-standing denial, a resistance to change, skepticism toward diagnostic findings and recommendations, or ambivalence toward the actions they know they should take (Clark, 1999). We may even perceive these individuals as negative or unmotivated. Yet all such emotions and behaviors are normal responses to unwanted change. As Rogers (1951) advises, we must grant a full acceptance of our patients and the stage they are within on their personal life's journey. We must not only accept patients where they are, but also, though active listening, demonstrate that acceptance and understanding.

It is a sincere understanding and recognition that all patient emotions and accompanying behaviors are normal responses to unwanted change that fosters a positive engagement between audiologists and their patients. However, clinical success is predicated on more than the positive engagements we can establish. For those patients who fall within the third and fourth categories outlined by Goldstein and Stevens, we must also find effective strategies to help patients develop the internal motivation for self-improvement that is at the root of desired clinical outcomes.

Motivational Engagement

As much as health professionals wish to believe to the contrary, clinicians can rarely motivate patients to take sustainable action, as such motivation can only arise from within a person. Through motivational engagement, the audiologist's role becomes one of facilitative coach as patients are guided to reflect on the impact of hearing loss, the costs and benefits of action or inaction toward effective remediation, and patients' willingness and perceived abilities to make positive changes in their lives.

While there are many approaches to guide others in self-reflection toward motivation, a powerful method for clinical audiology is brought forth through three simple geometric figures—circles, lines, and boxes. Hanne Tonnesen, a physician with the World Health Organization's Collaborating Center at Bispebjerg University Hospital in Copenhagen, has used these tools to help patients make powerful changes in their lives when confronting health issues such as necessary dietary changes, medication compliance, smoking cessation, and others. She helped bring these "tools" to audiology's attention through her collaboration with the Ida Institute.

Circles

It is through the understanding gained by listening to patients' stories, often facilitated through discussions of reports on self-assessment measures, that the audiologist can gain insight into how prepared a patient is to make the changes required for improved hearing. The circle of change not only helps the clinician to visualize better the patient's preparedness for change but also to determine if change is required in the attitudinal or behavioral domain (FIGURE 1).

Patients who are not ready for making the changes requisite for success (those who are in the final two categories of Goldstein and Stevens' readiness ranking) fall into one of two areas. Those in the pre-contemplative behavioral stage may fail to admit, or sometimes even recognize, that a problem exists and only come for evaluation at the behest of another. Those in the contemplative stage may recognize

that there is a communication problem but may not fully agree where the problem originates (e.g., others mumble). Those in either stage, as well as those who are preparing for change, need further information to help them to move forward, and it is our task to listen effectively and provide information in a clear and concise manner.

During these early stages we often must help patients increase their own appreciation of the personal impact of untreated hearing loss. Unfortunately, if the information and subsequent recommendations we provide are presented when emotions are high (e.g., following confirmation of hearing loss), patients may not be able to attend fully to the problem-solving recommendations the audiologist provides (Cahill et al, 1995; Canli et al, 2000; Richardson et al, 2004). The timing of information delivery suggests that before we proceed with details, we ask patients and attending communication partners if they have any questions about any overview statements we have made, or if they have any other questions on their minds. The questions patients have for us may be related to progression of the loss, hereditary issues, cost of hearing aids, unilateral or bilateral fittings, or any host of other possibilities. But until these are addressed, we fail to have their full attention for any details we may wish to present.

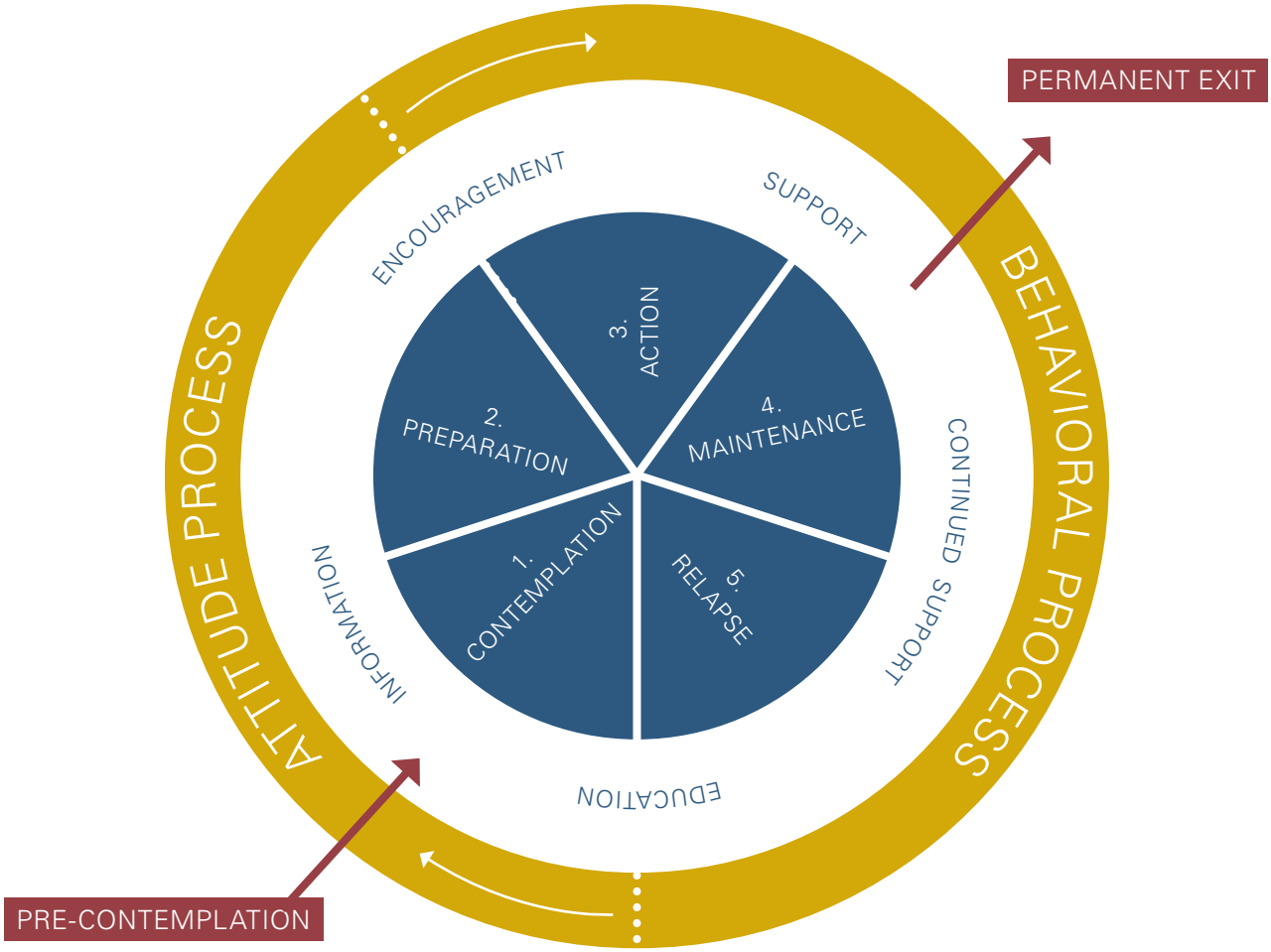


FIGURE 1: A cyclical representation of the stages of change that patients may confront when considering aspects of audiological treatment. Stages one and two require changes in attitude toward hearing loss or treatment avenues. Stages three through five represent stages requiring modification of current behaviors (modified from Prochaska and DiClemente, 1984).

When patients reach a level in which they are either prepared to make a change (move forward) or are actively proceeding with the recommendations given, our greatest assistance comes through encouragement focused on the benefits of the change they are moving toward. Finally, once a patient has been fit with hearing aids, it is vigilant aftercare that ensures continued follow through with hearing aid use and augmentative rehabilitation recommendations so that the patient does not relapse in the efforts that have been made.

While we frequently can tell where a patient resides on the circle of change quite early in a clinic appointment, sometimes we are not aware of his or her readiness ranking until we present our initial recommendation. As stated earlier, when motivation and readiness are low persuasive arguments, celebrity endorsements, third-party stories, and financial incentives frequently do not provide the inducements we may desire. Those within the stages of contemplation and preparation within FIGURE 1 are not quite ready to take action and with guidance need to reflect on the attitudes they hold toward hearing care and the need to change. An effective means to guide patients through constructive reflections can be achieved with the remaining two geometric forms—the lines and the boxes.

Lines

A visual tool to reflect on one's position on a given issue can generate needed focus and an opportunity to explore the directions one is choosing to take in life. The use of a of two lines representing a graduated scale from 0 to 10 (FIGURE 2) allows for a powerful visual "thermometer" to provide a ranking of (1) the perceived importance to make a change in one's life, as well as (2) a ranking of one's perceived ability to make changes (Rollnick et al, 2008). In audiological practice, the use of these lines is most effective in conjunction with discussions that may have evolved through self-assessment tools. The introduction of the lines may be as straightforward as the following:

Clinician: We've been discussing some of the frustrations you've had at home when talking with your wife. She seems to think it's all related to your hearing, but you think it is as much, or maybe more, the way she talks to you. Do I have that right?

Patient: Yeah. Like I said, she starts talking to me when she's in the kitchen and I'm in another room watching TV. Or with her head in the fridge. Nobody's going to hear someone like that.

Clinician: I agree. We also talked about your hearing and the fact that you have some hearing loss. But clearly the frustrations you're having seem to come from more than just your hearing loss alone. Take a look at this scale with me for a second. (Bring out the first line.) Given the frustrations you and your wife are having, how important is it to you to make life better. Zero (point to the 0) means making things better is not important to you or your wife and that everything is fine with the frustrations the way they are. Ten (point to the 10) indicates that it would be highly important to you and your wife to improve the situation at home. Can you take this pen and mark on the scale how important you think making a change would be? (Depending on the comfort level the patient has with the clinician, it may be awkward to ask the patient to mark on the line, but the active engagement of the patient at this point has been shown to strengthen the outcome.)

The key to success in using this first line is the earlier identification of some life issues that are impacted by the decreased communication function the patient/family is experiencing. If properly identified, patients will most

FIGURE 2. Use this scaling line with patients in two steps: (1) Have patients self-rank their perception of the importance of change in their lives and then (2) have patients rank their perceived abilities to make a change. The scale ranges from 0 "not at all important" or "not likely to be able to make a change" to 10 "very important to make a change" or "highly likely that a change can be made" (Rollnick et al, 2008).

Acknowledgement simply provides needed recognition and that what we are asking people to do is not always easy for them.

frequently rank importance of improvement relatively high (i.e., seven or above). If the ranking is lower than seven, the clinician may follow up with the question: "What can I do, or answer for you, that might move you higher on the scale?" If the patient has no concrete suggestion, it is time for the clinician and patient to engage the "box" to build better motivation to move forward, and the second line can be bypassed for the present time.

If the ranking on the first question is high, the clinician can move directly to the second question:

> **Clinician:** Let's look at another line scale for a moment. How likely do you believe you will be able to follow my recommendations, which might include using hearing aids, so that we can make your quality of life better? Zero would be not likely at all, and 10 would be highly likely. Can you mark this line for me?

Answering this second question begins to direct the patient toward reflection on the difficult processes often involved in changing behaviors. If the ranking on this question is also high, there is no reason to engage the boxes with the patient.

If the ranking for the second question is low, an appropriate follow up question would be: "Why do you think your abilities for this are so low?" The ensuing dialogue may uncover fears of technology, concerns of what others will think if hearing aids are worn, previous failure to follow through on difficult tasks, or some other concern. The clinician's task at this point is simply to acknowledge these concerns and reassure the patient that to some degree these issues are resolvable and that the clinician will be there to help every step of the way ("*Considering making a change like we are discussing such as using hearing aids can often be very daunting*"). We must recognize that

acknowledgement of another's concerns does not imply that we believe they are valid or that we agree with them. Acknowledgement simply provides needed recognition that we understand that what we are asking people to do is not always easy for them.

Boxes

Like the lines, boxes provide visual tools to help patients place their hearing loss into a more meaningful framework. The boxes are useful primarily for those patients who rank themselves low on the need to make a change. The dialogue may go something like this:

> **Clinician**: You don't seem to believe it's important to make any changes to improve the communication problems you're having, and maybe it isn't. But from what we've talked about (often first uncovered through completion of one of many available self-assessment scales) it seems something needs to change. For a moment, let's look at a framework that can help us sort out the advantages and disadvantages of change. Looking at this box, tell me what advantages you see for your life if you do nothing to address your hearing problem.

Directing the patient's attention to the upper left quadrant of FIGURE 3, the clinician helps the patient explore what the advantages of inaction are. It is important at this point for the audiologist to wait for the patient's lead. Audiologists, like most other health-care providers, are accustomed to leading the dialogue. However, as stated earlier, motivation comes from within. The thoughts that fill the quadrants of the box have far greater motivational power if they are the patient's thoughts. The upper left quadrant may be filled with items reflective of the comfort of leaving things the same, the safety in knowing that there is no need to learn anything new, or the money

BENEFITS OF STATUS QUO	COST OF STATUS QUO
POTENTIAL COST OF CHANGE	POTENTIAL BENEFITS OF CHANGE

FIGURE 3. A decisional balance box to guide patients in their own exploration of the pros and cons of inaction versus. forward movement (Janis and Mann, 1977).

saved by not purchasing hearing aids. The items placed in this square are most likely true concerns for the patient and should be acknowledged as such.

After reflection on the benefits of maintaining the status quo, attention is directed to the costs of inaction (upper right quadrant). Again, it is important that the audiologist takes a backseat and allows the patient to think of the costs of their hearing loss. Surveys reveal that audiologists most frequently do not engage the spouse in the hearing consultation process (e.g., Stika et al, 2002). However, it is readily apparent that reflections will be more fruitful with both communication partners drawn into the process. This quadrant may be filled with items that recognize the continued frustrations at home when misunderstandings occur, arguments arise due to hearing loss, become unable to hear grandchildren or withdraw from social activities, or any number of consequences of hearing loss. Asking the patient to look back at the previously completed self-assessment form can further facilitate this exercise. Completion of the final two quadrants in the box flows readily from the items in the first two quadrants often providing mirror images to the items previously written down.

Once the boxes are completed, it becomes apparent to all parties that the costs of inaction and the benefits of moving forward far outweigh the costs incurred by working toward solutions, or the benefits of the status quo. At this time, a reexamination of the first line will most often reveal a significant shift to the right for those who previously rated a need to change as a low priority.

Conclusion

Audiologists have frequently attempted to motivate their patients through traditional sales techniques, which often include financial incentives, celebrity endorsements, compelling arguments, and persuasion. However, the greatest source of motivation and the convincing arguments for change most always arise from within patients themselves.

Identifying the personal impact of hearing loss through guided discussions and active listening puts the audiologist in the position to ascertain where patients are on the circle of their own personal journeys from pre-awareness of their hearing loss to acceptance and recognition of a need to take action.

When patients believe they are not ready to move forward with a hearing rehabilitation plan, the use of the box tool may help patients plot their own cost-benefit analysis and will frequently give them the opportunity to weigh the pros and cons of inaction versus action, an exercise that most often leads to action.

Further discussion on the use of the circle, lines, and boxes, and other tools to meaningfully engage your patients, are available on the Ida Institute Web site: www.idainstitute.com.

John Greer Clark, PhD, is an assistant professor with the Department of Communication Sciences and Disorders at the University of Cincinnati, Cincinnati, OH.

The Ida Institute, founded with a grant from Oticon in 2007, is housed in Naerum, Denmark. The institute works collaboratively with international hearing care professionals to develop and disseminate tools to help forge professional/patient partnerships for exploration of the personal impacts of hearing loss and the effective rehabilitation of resultant communication difficulties. The author, along with David Fabry, PhD; Lorraine Gailey, PhD; and Hanne Tonnesen, MD, head of the World Health Organization's Collaborating Center in Copenhagen, Denmark, served on the Ida Institute faculty for the series of seminars titled "Motivational Engagement."

References

Beck DL, Harvey MA. (2009) Creating successful professional-patient relationships. *Audiol Today* 21(5):36–47.

Beck DL, Harvey MA, Schum DJ. (2007) Motivational interviewing and amplification. *Hearing Review*. http://www.hearingreview.com/issues/articles/2007-10_01.asp.

Cahill L, Babinsky R, Markowitsch HJ, McGaugh JL. (1995) The amygdala and emotional memory. *Science* 377:295–296.

Canli T, Zhao Z, Brewer J, Gabrieli JD, Cahill L. (2000) Event-related activation of the human amygdala associates with later memory for individual emotional experience. *J Neurosci* 20. RC99:1–5.

Clark JG. (2008) Listening from the heart. Audiology Online. http://www.audiologyonline.com/articles/article_detail.asp?article_id=2095.

Clark JG. (1999) Working with challenging patients: an opportunity to improve our counseling skills. *Audiol Today* (11)5:13–15.

Goldstein DP, Stevens SDG. (1981) Audiologic rehabilitation: management model I, *Audiology* (20):432–452.

Harvey MA. (2003) Audiology and motivational interviewing: a psychologist's perspective. Audiology Online. www.audiologyonline.com.

Janis IL, Mann L. (1977) Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment. New York: Free Press.

Prochaska JO, DiClemente CC. (1984) *The Transtheoretical Approach: Crossing Traditional Boundaries of Therapy*. Homewood, Illinois: Dow/Jones Irwin.

Richardson MP, Strange B, Dolan RJ. (2004) Encoding of emotional memories depends on the amygdala and hippocampus and their interactions. *Nat Neurosci* (7):278–285.

Rogers C. (1951) *Client-Centered Therapy*. Boston: Houghton Mifflin.

Rollnick S, Miller WR, Butler CC. (2008) *Motivational Interviewing in Health Care*. New York: Guilford Press.

Stika CJ, Ross M, Cuevas C. (2002) Hearing aid services and satisfaction: the consumer viewpoint. *Hear Loss* (SHHH, May/June):25–31.

Also of Interest

"Externalizing and Personifying Hearing Loss: A Psychological Tool for Audiologists," by Michael Harvey (*AT* March/April 2010): Log in to www.audiology.org and search key words "Michael Harvey."

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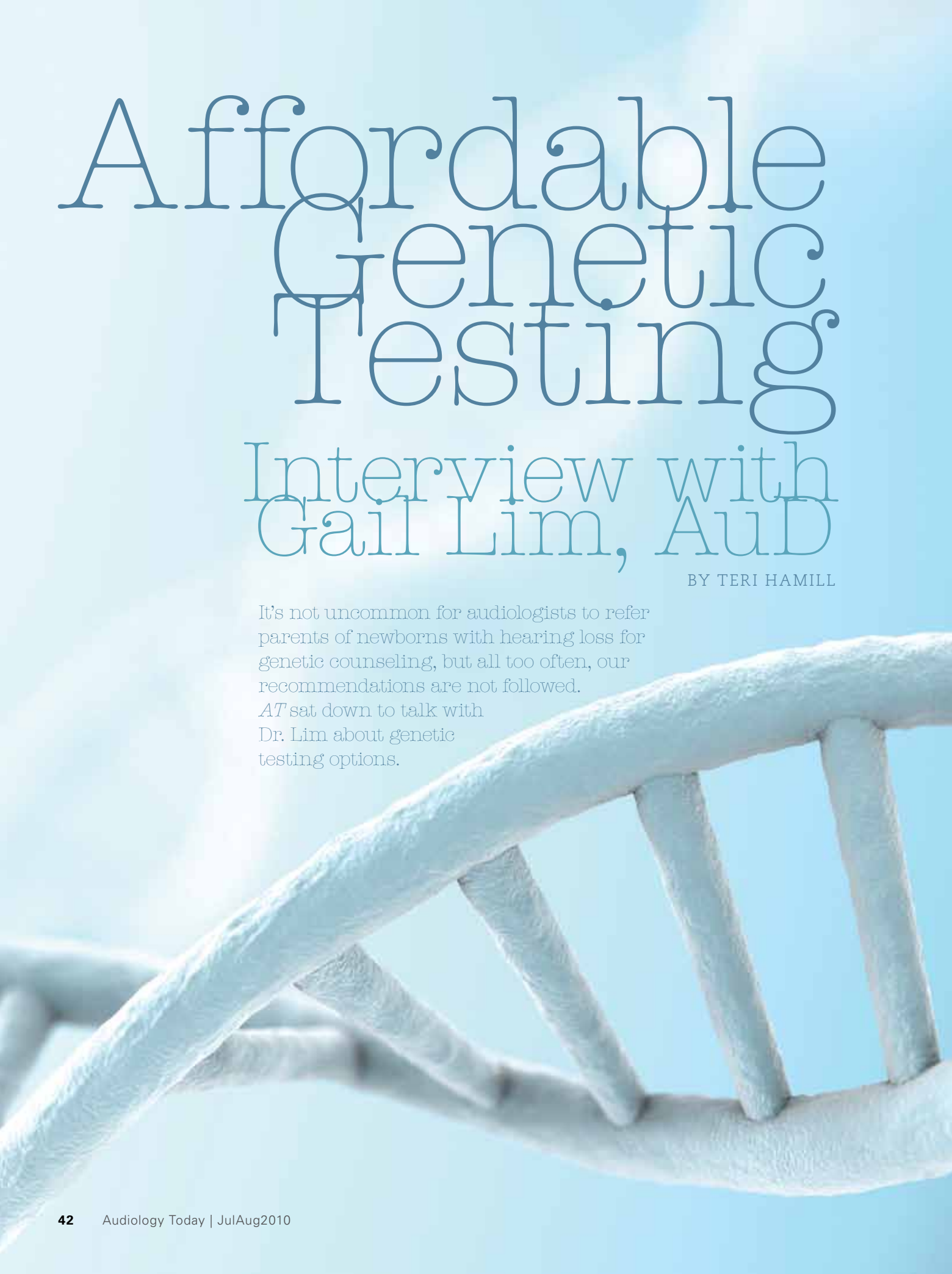
Affordable Genetic Testing

Interview with Gail Lim, AuD

BY TERI HAMILL

It's not uncommon for audiologists to refer parents of newborns with hearing loss for genetic counseling, but all too often, our recommendations are not followed. *AT* sat down to talk with Dr. Lim about genetic testing options.



Gail Lim, ARNP, AuD, is vice president for program development and the clinical director of the Neonatal Screening Program for Pediatrix Medical Group, which screens the hearing of over 480,000 infants per year in the United States. The program also facilitates follow-up on those who do not pass the screening. Clinical data from Pediatrix's hearing screening program indicate genetic etiology for an increasingly large percentage of infants with hearing loss; the incidence of hearing loss associated with the traditional risk factors such as low birth weight and birth anoxia is declining, possibly due to today's improvements in medical care. It's not uncommon for audiologists to refer parents of newborns with hearing loss for genetic counseling, but all too often, our recommendations are not followed. *AT* sat down to talk with Gail about genetic testing options.

AT: If a baby is diagnosed with congenital hearing loss, what's the likelihood that it's genetic?

GL: Let me recommend to you an article, "Newborn Hearing Screening—A Silent Revolution," by Dr. Cynthia Morton and Dr. Walter Nance (2006). It is my favorite article on genetics and hearing; it has the best diagrams, and it brings genetics to a level that people can understand. They estimated that about 65 percent of neonatal hearing loss is attributed to genetic causes. But unfortunately, genetic testing is not routinely performed on children with hearing loss, so the real prevalence may be higher. Our internal data suggest that the three strongest risk factors for sensorineural hearing loss are (1) having a sibling with hearing loss, (2) having a parent with hearing loss, and followed by (3) having any family member with hearing loss; so family history is significant. Other risks that are associated with hearing loss are babies having cardiac defects and eye abnormalities, which as you know, are common with syndromic hearing loss.

I also want to let you know that I am not a genetic counselor or an expert in genetics. My professional background is an audiologist and a neonatal nurse practitioner.

Understood! This is probably a good time to make sure we are clear on our definitions. "Syndromic" means…

"Syndromic" means that distinctive associated clinical features have been characterized, such as Down syndrome.

And not all syndromes that cause hearing loss are genetic, right?

Yes, that's correct, not all are genetic, but most syndromes are genetic. There are more than 300 forms of syndromic hearing loss.

What are the most common syndromic causes of hearing loss?

Some of the most common autosomal syndromes are Usher's, Pendred's, Waardenburg's, and brachio-oto renal syndrome, or BOR.

And remind us what "autosomal" means?

The transmission is on one of the genes that is not the X or Y sex chromosome.

Table 1. Tests Conducted in the SoundGene Screening Panel

Connexin 26 (Cx26) GJB2 Mutations[1]
35delG
235delC
167delT
M34T
Connexin 30 (Cx30) GJB6 Large Deletion
309kb large deletion
Mitochondrial Mutations
7445A>C (A7445C)
7445A>G (A7445G)
7444G>A (A7444A)
961T>C (T961C)
961T>G (T961G)
961delTT+C(n)ins
Pendred SLC26A4 Mutations
L236P
E384G
1001+1G>A
T416P
Cytomegalovirus
Detection of virus DNA

1. Under sublicense with Athena Diagnostics: U.S. Patent Numbers 5,998,147 and 6,485,908 and patents pending.

Generally, syndromes are recognized by physical features more so than by genetic testing?

Yes, but Pendred's is one of the exceptions. While it can be present at birth, it's generally not symptomatic at birth.

And some hearing loss, for example, that caused by Connexin genetic mutations, is not syndromic?

Correct, only about 30 percent of the genetic losses are syndromic, which means most babies do not have clinical features that could clue the practitioner that a problem may exist. Connexin is the most common cause of non-syndromic hearing loss and is usually autosomal recessive, which explains why two hearing parents may have a deaf or hard-of-hearing child. In fact, 95 percent of hearing-impaired babies have parents with normal hearing.

About how many genetic causes of hearing loss have been identified?

There are over 300 syndromic causes of hearing impairment. The incidence of nonsyndromic deafness is higher than syndromic hearing loss; nonsyndromic loss accounts for about 70 percent of genetic hearing loss. Some genetic causes are easier to identify than others through genetic testing. Usher's syndrome is one of the difficult ones; it can be caused by one of 400 mutations on eight different genes. Also, there are mitochondrial causes of hearing loss.

How is mitochondrial DNA different from the autosomal DNA?

The mitochondria are the part of each cell that provides the cell energy, and the mitochondria have their own genes made up of DNA. Those DNA are inherited from the mother, almost never from the father. Mitochondrial defects can be recessive or dominantly inherited, and can result in syndromes or in nonsyndromic hearing loss.

Typically, how has genetic testing routinely been conducted, and why is it that so few hearing-impaired infants receive genetic testing?

Getting genetic testing to become routine has been a challenge. One of the first challenges is obtaining an order from the primary care physician to perform a genetic test. Second, parents and physicians face the challenge of finding a lab to do the testing. Not all labs are licensed to do all the tests. Then, the physician has to decide which genetic cause should be tested for first.

Once the test is ordered (for example, Connexin), 10 cc of blood is drawn from the baby and sent to a laboratory. Approximately four to six weeks later, the physician receives the results. If the results are negative, the process is repeated with the next possible genetic cause. When testing is being performed sequentially like this, it can easily end up taking months or years to find a cause, and, of course, sometimes the cause will still not be known. That means the advantages of knowing the cause at an early age are lost. Because the process can be lengthy, expensive, and frustrating, physicians may be hesitant to order genetic testing.

How expensive is that form of genetic testing?

It ranges, generally from $300 to $1,500 per test.

But I understand that an alternative is now available, that allows less expensive, easier genetic testing.

Yes, physicians can order SoundGene™ testing, which was developed in conjunction with Pediatrix Medical Group, the organization I work for. SoundGene is based on a panel of the most common genetic and environmental risk factors for congenital hearing impairment. With just one test order, multiple common causes of hearing loss are tested for simultaneously—one environmental cause and 15 common genetic causes (SEE TABLE 1).

Which environmental cause are you looking for with the blood test?

We are testing for Cytomegalovirus (CMV) DNA.

You aren't doing an antibody titer?

No, we use polymerase chain reaction to amplify the circulating viral DNA in the baby's blood, and we target conserved areas of two viral genes. Only infants with high viral loads will be detected. CMV is thought to account for about 30 percent of the environmental causes of hearing loss, and it may be even more prevalent. This blood testing will allow identification of this environmental cause. So, let me step back and recap the process that I have described so far.

The incidence of deafness can vary over time and in different geographical regions; however, data from newborn screening programs suggest that the incidence of hearing loss is approximately 2–3 per 1,000 births. These hearing losses are thought to be caused by environmental

factors 40 percent of the time and genetic factors the remaining 60 percent.

The SoundGene panel is comprised of testing for both the CMV environmental cause and common genetic causes. Congenital CMV infection is the most common environmental factor causing hearing loss. CMV affects on average one percent of newborns in the United States. Of course, not every baby with CMV infection has hearing loss. The overall risk of hearing loss in CMV-infected infants averages about 10 percent. The hearing loss caused by CMV may be unilateral, fluctuating, progressive in nature, and can be delayed in onset for months or even years. CMV is a DNA virus that circulates in the blood and other body fluids. This testing detects the CMV DNA, not the antibodies to the virus.

The Connexin 26 gene defect is the most common form of genetic deafness in the United States. The Connexin 26 and 30 mutations account for about 24 percent of all congenital hearing loss cases in newborns. The Connexin 30 and the four common Connexin 26 mutations included in this panel detect approximately 60–70 percent of all Connexin deafness, and approximately 14–17 percent of all congenital hearing loss cases.

The Connexin 26 mutations 35delG and M34T are most common in Caucasians; the 167delT is common in Ashkenazi Jews; and the 235delC mutation is common in Asians. Newborns with Connexin 26 deafness may have profound hearing loss at birth; however, some newborns with possible combinations of Connexin mutations and other mutations may pass the newborn hearing screen test but have hearing loss later in life.

Let's stop for a moment. You've used a lot of numbers. What do those numbers like 35delG mean?

The numbers refer to a certain place, or location, on a specific gene. If you were doing what is called gene sequencing, you would be looking at every unit of the gene for a possible

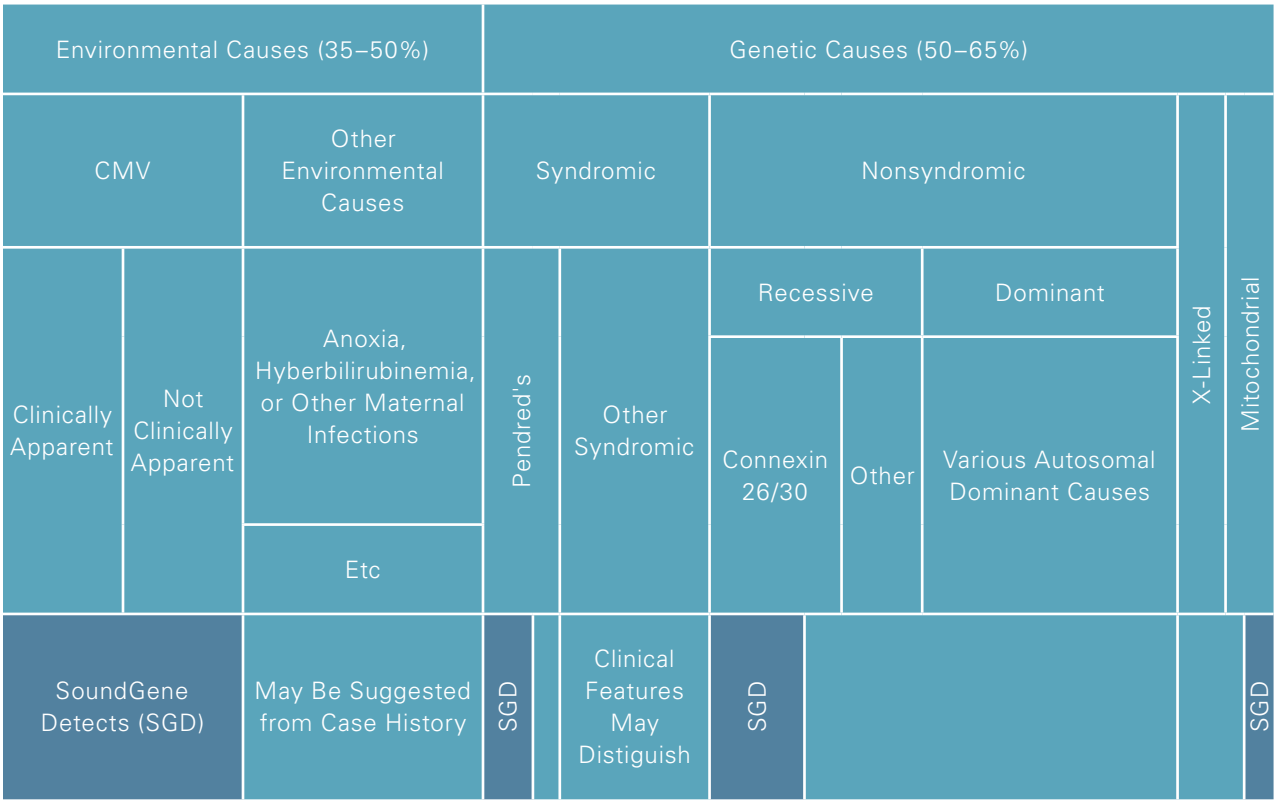


FIGURE 1. Approximate percentage of causes of neonatal hearing impairment and the relative proportion of each detected by SoundGene.

mutation of that gene along the way. In the SoundGene's genetic testing, we know that common genetic mutations occur in specific points in the gene. So SoundGene is looking at specific points or locations on the gene that are known to be places where mutations may occur.

So, you don't sequence the entire gene, you take your "genetic magnifying glass" out and look at specific locations to see if there is a genetic defect at that point?

Exactly. SoundGene looks at 15 specific points to see if a genetic mutation is present in those common problem areas. This also means that if the results are negative, there still could be a genetic mutation at a different location. Additionally, some genetic causes are harder to identify. For example, Usher's syndrome can involve multiple genes and therefore is not considered a "single gene mutation." As a result, it's significantly more challenging to detect through any genetic testing. While SoundGene does not currently test for Usher's, it does test for Pendred's, which is a syndromic cause.

Pendred's syndrome is caused by the SLC26A4 gene and accounts for about three percent of all congenital hearing loss cases, or about five percent of the genetic deafness causes. The hearing loss associated with this disorder has a variable age of onset from infancy to early childhood, and the hearing impairment can be severe-to-profound but tends to be progressive.

The disease also causes thyroid enlargement that may not be apparent until adolescence or adult life, thus complicating attempts to anticipate the hearing loss. The common mutations (L236P, 1001+1G>A, T416P, and E384G) have been shown to cover approximately 60 percent of Pendred's syndrome in the United States. These common Pendred's syndrome mutations will cover 1.8 percent of all congenital hearing loss cases. There are other genetic mutations for Pendred's that SoundGene does not currently test for.

I am looking at the list of tests included in the screening panel (SEE TABLE 1), and it also lists six mitochondrial mutations.

That's correct. Testing for the presence of six mitochondrial mutations will be included in the SoundGene panel. Mitochondrial mutations account for 0.6 to 20 percent of all congenital hearing loss cases in the United States (0.6 percent in Caucasians, 3.5 percent in Asians, and 20 percent in Hispanics). SoundGene tests some, but not all, of the mitochondrial mutations that have been associated with hearing loss. It's also possible that some of these mutations (SEE TABLE 1) might be false positives—they may occur in non–hearing-impaired persons as well. The field of genetics is not yet certain how common it is to find mitochondrial-caused hearing loss.

I am fascinated by the mitochondrial causes and often wonder if they are more common than previously thought. I believe that this is an important area for us in the future management of children with hearing loss.

Interesting.

Genetic causes of hearing loss is a topic that captures many physicians' attention—as well as how hearing loss etiology may relate to other body functions. When I speak to physicians about genetic testing, it gives me the opportunity to remind them of the importance of NOT considering a passed newborn hearing screen as the end of the story, especially in high-risk infants.

Physicians already recognize that their high-risk infants are at increased risk for motor development problems, vision problems, etc., and this provides me with an opportunity to reiterate the importance of being vigilant about monitoring the child's hearing health. I urge them to send high-risk children and their families to an audiologist to monitor and follow up on their conditions.

I love your passion about pediatric management! Returning to this specific test panel, the SoundGene panel will tell us the cause in what percentage of cases?

The figure in this article shows the estimated relative frequency of different causes of hearing loss. It's really not possible to know exact percentages at this point. There hasn't yet been enough genetic testing to know how common different etiologies are, but we think that SoundGene can be used in conjunction with other diagnostic approaches to help parents understand the cause of the infant's hearing loss, and know more about the prognosis for hearing loss progression.

How much blood needs to be drawn from the baby to do this testing?

A couple of drops, just enough to fill just two or three circles, each filled with a drop of blood. The filter paper has space for four circles, but really, we only need two.

Wow!

This is called dried blood spot testing. Although there is an array of DNA extraction kits commercially available, few can be used for dried blood spot testing. I believe that SoundGene is a highly efficient, cost-effective solution for screening the population for common causes of hearing loss.

I have heard of dried blood spot testing for newborn metabolic screening—where they take the sample of the baby's blood collected at birth to see if there were inborn metabolic errors. Can the same birth dried blood spot be used for other genetic testing as well?

Yes. The birth sample can be used for the SoundGene testing and is better for CMV testing when determining congenital versus acquired CMV infection. That birth sample can be used as long as the birth sample was stored properly and the blood hasn't been used up. When the blood spot is analyzed, for example, for metabolic disorders, tiny samples are punched out of the filter paper to perform testing. Some laboratories may need to perform repeated testing, so it depends on how many punches have been taken, and how the sample was stored. You can extract DNA for a long time, unless the sample has been stored in a harsh environment, such as extreme heat.

How long is the birth sample retained?

This can vary from state to state. Some states keep the sample only a couple months and then destroy it, while other states may keep the sample as long as 21 years.

In general, the reason the birth sample is used is for the CMV part of the test, since CMV can be acquired after birth.

Let me just be sure I'm understanding correctly. You say you test for the cytomegalovirus's DNA—if the baby is older than a couple days, then you can't determine if the exposure was prenatal?

Correct. To determine whether a positive CMV is congenital, if it occurred before birth, versus acquired after birth, the blood for the screen should be collected within two weeks after birth. The panel can test for CMV at any age but will not be able to determine whether the positive for CMV is congenital versus acquired. If the birth bloodspot can be retrieved and there is enough blood to collect from the birth sample, the panel can run all tests on the sample.

What does it cost to have SoundGene testing? Is the cost typically covered by insurance?

The cost of the entire SoundGene screen, which tests for most forms of Connexin, and Pendred's, and for select mitochondrial causes and for the presence of CMV, is $198. I really don't know if insurance covers the test; we do not bill insurance companies. We are billing the hospital laboratory, the patient, or the physician office. But I have been told that if it is a "medical necessity," it has a higher likelihood of receiving payment from third-party payers.

In some cases, it's not just the baby who is tested, but parents and/or siblings are also sometimes tested. In fact a lot of our testing is being done on adults and older children.

So, SoundGene tests for the more common nonsyndromic genetic causes from most of the Connexin defects and looks for the presence of CMV DNA in the blood, but you don't test for syndromic causes because those can be detected from clinical signs?

Also of Interest

In the News article: "Genetic Counseling, Connexin Genes, and the Role of the Audiologist: Interview with Ali A. Danesh, PhD"

Log in to www.audiology.org and search key words "genetic counseling."

If the SoundGene panel results are negative, this does not necessarily mean that the patient is negative for genetic or environmental causes.

Basically, yes, that is correct, except for Pendred's, which is syndromic, and we do test for that. It can be hard to recognize from clinical features alone at birth, and because it's important to monitor and treat that baby if and when the hypothyroidism becomes an issue.

And the total cost is $198? That's great; that's less than the traditional test for one single cause of genetic loss. If a genetic defect is found, what happens? Does a report go to the physician, the parent, or the audiologist?

SoundGene testing must be directly managed by a physician. There are genetic counselors who call the physician in the event of a positive result. The physician will manage the care of the patient and also discuss the results with the patient's parents. The patient's parents cannot be given the results directly from the lab.

I don't suppose that I, as an audiologist, can draw the baby's blood and order the test?

No, it is not within the professional scope of an audiologist to order, draw blood, or manage the SoundGene screen. However, the audiologist can make the SoundGene packets available to their patients or the patient's parents, which they can then take to the physician to have the test ordered and the blood drawn. This makes the process easier for parents and physicians by having the packets available to be able to do the test.

Furthermore, the physician can write the test order for the patient so blood can easily be drawn either in the physician office or in a laboratory. Again, only a few drops of blood are needed from the patient's heel, if a baby, or finger, if a child or older person. Alternatively, the physician can arrange to have the birth blood spot used if it is available.

You mentioned SoundGene "packets"?

The SoundGene packet is an envelope that contains the filter paper for the actual blood spot collection, educational letters for the parent and physician, payment information, and a prepaid postage envelope for overnight delivery to send the sample to the lab for testing. Once the sample is received at the lab, results are usually available in less than 72 hours.

So I can keep the "packets" in my office, and give it to the parents to take to their pediatrician or ENT, or send it with my report to the physician?

That's correct.

How do I order the packets, and what do they cost me?

You can order by contacting SoundGene at 877-220-1070 or gail_lim@pediatrix.com or www.soundgene.com.

There is no charge for packets to have them available for your patients.

I hope you have staff ready to answer that toll-free number!

Actually, that number rings directly to me. I am available to answer questions 24 hours a day, and the primary reason for that is because the SoundGene test is fairly new to some physicians, so I want to be available to help answer questions from genetic counselors, audiologists, pediatricians, or neonatologists.

So, if I'm understanding correctly, this is great, SoundGene looks for 15 of the most common genetic causes and for a common environmental cause: CMV. But there are hundreds of genetic causes of hearing loss, so a negative test doesn't mean that the hearing loss is not genetic?

Correct. If the SoundGene panel results are negative, this does not necessarily mean that the patient is negative for genetic or environmental causes. There may be yet another type of genetic or environmental cause that was not tested in the panel.

It sounds like what SoundGene does is a lot like the metabolic testing done at birth.

Yes, it's a very similar process. In the genetic metabolic disorder screening they are examining for genetic defects for things like fatty acid disorders, cystic fibrosis, etc., and they are looking for point mutations for these common genetic metabolic disorders. Also, in metabolic genetic screening, a negative does not necessarily mean a negative result. There still can be disorders caused by other mutations that were not tested.

State newborn screening programs look for genetic metabolic disorders, but I am not aware of any state that is routinely testing for genetic causes of hearing disorders. There is a state metabolic test that is associated with hearing loss called Biotinadase. There are significant benefits for testing for genetic hearing loss, as well as for all the reasons audiologists well know about early identification and treatment of hearing loss.

You've mentioned Pendred's as one of those disorders where knowing the cause of the hearing loss helps with medical management.

Yes, and CMV is another. This is a disease that may affect neurological and motor development and vision as well as causing hearing loss. The baby with CMV needs to be monitored by a physician for medical management, and also needs ongoing audiological evaluations.

And knowing if the loss is due to Connexin, which often progresses to severe-to-profound loss, might impact hearing habilitation.

Yes, if you know a baby has Connexin-related deafness, the baby may need cochlear implants as a management choice, and more knowledge about the cause of hearing loss leads to better audiology management.

In the interest of full disclosure, you mentioned that SoundGene is a product from your company, Pediatrix. Where else can I go for this sort of blood spot genetic analysis?

I am not aware that there are any other "bloodspot" screens currently available for detecting causes of hearing loss other than SoundGene. The purpose of developing this screen was to make the testing of the most common genetic and the most common environmental causes of hearing loss easily available for physicians and patients.

Thank you, Dr Lim. I think audiologists will appreciate knowing about the availability of this test.

My pleasure speaking with you. A frequent question that parents may ask the audiologist is: "What caused my child's hearing loss?" I think SoundGene gives audiologists an avenue to facilitate testing for causes of hearing loss. Hopefully this will also help close the gap from detection to diagnosis and ultimately toward intervention.

Teri Hamill, PhD, is a professor of audiology with Nova Southeastern University, in Ft Lauderdale, FL.

Reference

Morton CC, Nance WE. (2006) Newborn hearing screening—a silent revolution. *New Engl J Med* 354(20): 2151–2164.

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DO MIDDLE SCHOOL STUDENTS SET SAFE VOLUME LEVELS FOR ROUTINE IPOD USE?

A COMPARISON OF MONAURAL VERSUS BINAURAL LISTENING TRENDS

BY CAROLINE K. SNOWDEN AND DAVID A. ZAPALA

A middle school student researches the habits of her peers when selecting the volume level on personal listening devices. The study concludes that most middle schoolers select unsafe volume levels, and their monaural listening behavior results in further risk to their hearing health.

This study investigates whether middle school students set safe volume levels for routine iPod use and whether monaural listening, as opposed to binaural listening, affects selected volume levels. Results show that the majority of middle school students set unsafe volume levels, and chosen monaural volume levels are significantly greater than binaural volume levels. Age and sex had no significant effect on selected volume levels.

Background

Apple iPods have become increasingly popular as personal listening devices that are less bulky and able to hold more songs than their predecessors. However, as other authors have noted, the iPod could potentially pose a weighty threat to auditory safety (Fligor, 2007; Kean, 2010). Some iPods have been found to reach volumes as high as 111 dBA, a volume that can potentially damage hearing after one minute of exposure (Fligor, 2006). With 22,727,000 iPods sold in the first quarter of the Apple corporation's 2009 fiscal year (Apple Inc., 2009), these ubiquitous listening devices have become a potential health issue demanding further exploration.

Recent studies have revealed that the majority of iPod owners are younger than 30 (CNET News, 2005; Dwase, 2006; Kleinschmit, 2006). Of particular interest is the ownership of iPods among teenagers and children. A 2008 survey reported that 73 percent of respondents aged 12–17 owned an iPod/MP3 player (Rose and Lenski, 2008). One study reported a 12 percent incidence of noise-induced hearing loss (NIHL) in child and teenage subjects (Wang, 2008). However, few studies have been conducted to determine whether these statistics are related; those that test the volumes that individuals select generally focus on young adults, aged 18–30 (Fleming, 2007).

Of additional interest is a new trend observed among the teenage community: monaural listening. Many individuals with a set of in-the-ear headphones, or "buds," attached to a single portable music player

utilize one bud in each ear as intended. However, a practice commonly observed among teenage users is the sharing of a pair of earphones with a friend, so that each listener employs only one bud. Alternatively, some listeners use only one earphone in order to remain at least partially aware of their surroundings. The effect of monaural listening on volume selection, particularly among this age group, has also not been studied.

Purpose

This study sought to determine whether the average 12- to 14-year-old chooses safe volume levels for routine iPod listening and whether the use of one headphone (monaural listening) or two headphones (binaural listening) affects the volume that is set. This study also sought to establish the possible effect of age and sex on selected volume levels, listening duration, and subjective assessment of intensity.

Methods

All procedures in this study were approved by a school district-designed human subjects review process as outlined in the *International Rules for Precollege Science Research: Guidelines for Science and Engineering Fairs 2008–2009* for middle school science fair projects set forth by the Society for Science and the Public (www.societyforscience.org/isef).

Test Participants

Subjects were recruited from the population of middle school students attending the school of the researcher. Written informed consent was obtained from each subject and a parent or legal guardian of each subject.

Test Setup

Subjects were tested in a quiet environment, with a background volume level of approximately 54–57 dBA. A Fonix FP40-D precision sound level meter with spectrum analyzer (Frye Electronics Inc., Tigard, OR) was used to collect measurements. Input was obtained through a microphone attached to a HA-1 2 cc coupler.

Two pairs of iPod headphones (Apple Inc., Cupertino, CA) were labeled Set 1 and Set 2. They were plugged into an iPod splitter, the two jacks of which were labeled Jack 1 and Jack 2. Each pair of headphones was plugged into the jack with the corresponding numbers. Before subject testing, tests verified that the earphones of both sets emitted the same intensity of sound when the same song clip was played at the same level of iPod volume setting by comparing the overall level of each transducer on the FP40-D.

The right earphone of Set 1 was centered and attached over the "canal" of the HA-1 coupler. Plastic modeling clay (Silly Putty, Crayola Inc., Easton, PA) both attached the headphone to the coupler and acted as a barrier to outside sound.

With each testing session in a new location, the researcher verified that the right earphone of Set 1 was consistently emitting the same level of volume as it had during other tests of the same clip of music at the same volume. The researcher also ensured that the output of the iPod did not exceed 110 dBA by using the volume lock feature of the iPod. Subjects were thereby prevented from setting the volume of the iPod above 110 dBA, the safe volume level established by NIOSH (National Institute for Occupational Safety and Health) (Wang, 2005) for 80 seconds of exposure. The maximum time of sound exposure for each subject was 80 seconds.

Volume Selection Procedure

Each subject was asked to listen to a 20 second music clip and to set the volume of the iPod to the volume to which they would listen on an iPod of their own. Each subject was read the same script directing him or her through the testing procedure. The same 20-second trial was conducted four times: twice with both earphones and once each with a right and left earphone only. Four calculated

Table 1. Selected Subjective Volume Levels vs. Selection of Safe Volume Levels

Subjective Volume Level	Percentage Who Set Unsafe Volume Levels
2	14%
3	33%
4	74%
5	100%

volume levels (CVLs) were measured: two binaural CVLs and a right and left monaural CVL.

Self-Estimation of Volume Levels and Weekly Listening Habits

Immediately after the selection of volume levels, the subjects were asked to complete a survey asking them to self-assess their overall selected volume level and to estimate their weekly listening time. The surveys were completed outside of the room and later collected for analysis.

Data Collection

At the completion of each trial, a spectrum analysis was printed and labeled with the appropriate trial and subject number. These printouts were affixed to the corresponding subject's survey, which was collected after testing.

Analyses

Data were tabulated using Microsoft Excel. All statistics were calculated using GB statistics software, version 9 (Dynamic Microsystems, 2002), with a p value of <0.05 indicating significance.

Average Monaural, Binaural, and Overall Selected Volume Levels

The researcher developed an average binaural SVL (BSVL) for each subject from the two binaural trials and an average monaural SVL (MSVL) for each subject from the monaural trials of the right and left ear. An overall selected SVL was calculated by averaging the results of all four trials.

Calculation of a Safe Level of Volume

The researcher calculated a safe level of volume for each subject based on his or her reported exposure time, using the formula

$$t = 28{,}800/2(L - 85)/3,$$

solved for L, where t = the duration of sound exposure in seconds per day and L= the intensity of the sound in dBA. This formula was the basis for guidelines published by NIOSH (1998). When solved for L, it became the equation

$$L = \log 2[(28{,}800/t)^3] + 85.$$

Determination of Safe/Unsafe Volumes

The calculated safe volume level L, hereafter called the CSVL, was compared to the average SVL of each subject. If SVL > CSVL, then the researcher concluded that the subject was listening to unsafe volume levels. If SVL ≤ CSVL,

Selected Volume Levels for Middle School Students

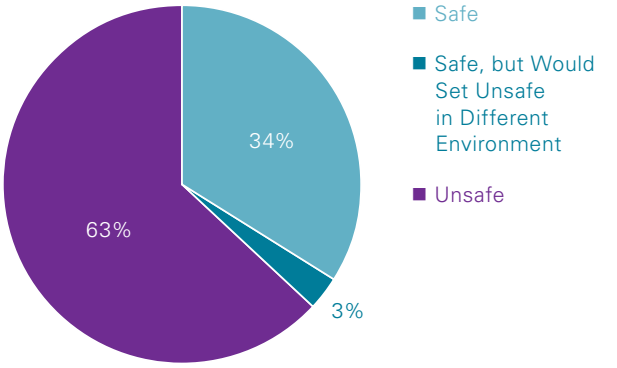

FIGURE 1. The majority of subjects set unsafe volume levels.

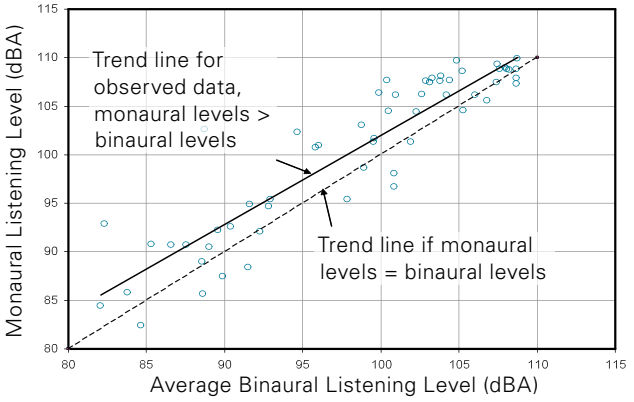

FIGURE 2. The difference between these two trend lines shows that monaural volume levels are greater than binaural volume levels. Without the ceiling effect, the slopes of these lines would probably be approximately equal and separated by 3 dB.

Monaural vs. Binaural Selected Volume Levels in Middle School Students

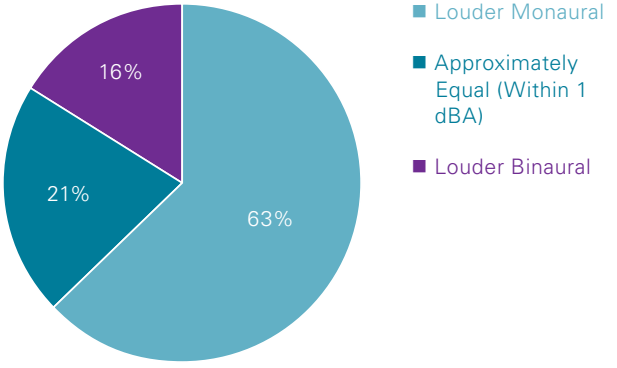

FIGURE 3. The majority of subjects had greater monaural volume levels than binaural volume levels.

then the researcher concluded that the subject was listening to safe volume levels. Safety ratios were calculated, using the formula

SR = CSVL/(MSVL, BSVL, or SVL).

Safe/unsafe volume could also be determined using these ratios: if SR ≥ 1, the volume level was safe, and if SR < 1, the volume level was unsafe. Safety ratios were statistically analyzed.

Comparing MSVLs and BSVLs

MSVLs and BSVLs were compared and statistically analyzed to determine whether the subjects selected greater monaural or binaural volumes.

Analyzing Judgment of Intensity

The self-reported intensity of each subject's SVL was expressed as an integer on a scale of 1–5 (1 being the least intense and 5 being the most). The researcher tabulated these data to show the percentage of subjects within each subjective level that set unsafe listening volumes.

Determining Effects of Sex and Age

The BSVLs, MSVLs, overall SVLs, safety ratios, and exposure time of males and females were compared and statistically analyzed. The influence of subject age (in years) was similarly analyzed.

Results

A total of 58 middle school student subjects (24 males and 34 females) volunteered to participate as subjects. Subject ages ranged from 12 to 14 years. Overall, 63 percent of subjects set unsafe volume levels (FIGURE 1). Breaking this down by listening configuration, 65 percent of monaural selected volumes were unsafe, and 53 percent of binaural selected volume levels were unsafe. Additionally, 31 percent of subjects set or wished to set the testing iPod to its maximum volume setting of 110 dBA.

Monaural selected volume levels were significantly higher than binaural selected volume levels ($t = 4.87$, $p < 0.0001$), with a consistent approximate 2 dBA difference (FIGURE 2). Selected monaural volume levels were greater than binaural levels in 63 percent of subjects. Binaural volume levels were greater than monaural in 21 percent of subjects. Binaural and monaural levels were approximately equal in 16 percent of subjects (FIGURE 3).

Of subjects whose self-reported intensity estimates were 2 out of 5 (listening level judged to be not very loud), 14 percent set unsafe volume levels. Further, 33 percent of

subjects who rated themselves a 3 out of 5 set unsafe volume levels; 74 percent of subjects who rated themselves a 4 out of 5 set unsafe volume levels; and 100 percent of those who rated themselves 5 out of 5 set unsafe volume levels (TABLE 1). Even among those who judged themselves as setting volume levels that were average (3) or below average (2), a relatively large percentage still set unsafe volume levels.

Age and sex had no statistically significant effect on the variables tested. Age and sex had no effect on the difference between monaural and binaural volume levels ($F = 0.622$, $p > 0.1$), no effect on exposure duration ($F = 0.662$, $p > 0.1$), and no effect on the safety of selected volume levels ($F = 0.417$, $p > 0.1$).

Discussion

Noise exposure can speed the process of hearing degeneration, resulting in NIHL (NIDCD, 2008). With 63 percent of subjects in this study setting unsafe volume levels, the data suggest that the listening habits of middle school students may be increasing their risk of NIHL. The volume selection habits of 12- to 14-year-olds have not previously been studied. One may speculate that as age and personal autonomy increase, iPod ownership and selected listening volumes will also increase. The unsafe listening habits in 12- to 14-year-olds are particularly significant because of the cumulative nature of NIHL. Previously, one might begin to risk hearing loss during young adulthood, as one entered the workplace. As these data show, iPod listeners of only 12–14 years of age are regularly exposed to unsafe volume levels. If this usage trend continues, hearing loss in the future population may not only be more widespread but also occur earlier in life.

There is a paucity of research about the effects of monaural listening. Anecdotally, this trend appears to be increasingly widespread: sometimes a student may wish to share music with a friend, or retain partial awareness of one's surroundings. This practice is more likely than traditional binaural use to lead to the selection of unsafe listening levels.

These data suggest that many of the subjects in this study, though risking NIHL by setting unsafe volume levels, did not see their behavior as risky. They inaccurately

judged the intensity of their selected volume level. Because adolescent judgment is not sufficient to protect students from sounds of dangerous intensity, perhaps it is now necessary to use objective volume limits. For the present, it may be wise to use the volume lock feature on the newer iPod models, establishing a safer maximum volume setting. Manufacturers of portable personal listening devices like the iPod could also limit the output of their units and headphones in future models.

Another potential way to aid listeners in setting safe volume levels would be to develop an iPod application visually indicating safe and unsafe volume levels. As a treadmill is programmed with a person's weight and then able to calculate that individual's calorie output, an iPod could be programmed with a person's listening duration, and then calculate that person's safe volume level. Ideally, just as all songs on iTunes currently list an artist name, title, and genre, they could also come with a dBA level of the song at each volume setting. Then, the volume bar on the screen of the iPod would turn red when set to a volume level above the individual's safe level, and green when set below it.

None of these changes will occur without education. People must be made aware of NIHL and helped to differentiate safe from unsafe sound. Unlike other injury, hearing loss shows no symptoms until its permanent manifestation. Without education and action, many 12- to 14-year-olds may one day discover that their teenage listening habits carried a higher price than they imagined.

Conclusion

The majority of middle school students in this study, regardless of age or sex, did not set safe listening levels for routine iPod use. Monaural volume levels are significantly greater than binaural volume levels. Accuracy of subjective judgment of intensity among middle school students is poor. These results suggest that without additional feedback, many middle school students will self-select listening levels that are loud enough to risk hearing loss, and they will not perceive that this sound exposure may be damaging to their hearing. Moreover, the practices of listening with only one ear bud or sharing an ear bud with a friend may increase overall sound exposure to more damaging levels.

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David Zapala, PhD, is an assistant professor in the Mayo School of Medicine and a senior consultant in audiology at the Mayo Clinic in Jacksonville, FL. This project was completed as a middle school science fair project. It won first place in the 2009 Florida State Middle School Science Fair Competition.

References

Apple Inc. (2009) Apple reports first quarter results. www.apple.com/pr/library/2009/01/21results.html (accessed July 25, 2009).

CNET News. (2005) Who's buying iPods? http://news.cnet.com/Whos-buying-iPods/2100-1041_3-5577396.html (accessed September 1, 2008).

Dwase D. (2006) Study profiles MP3 ownership patterns. *American Chronicle*. www.americanchronicle.com/articles/14355 (accessed November 2, 2008).

Fleming N. (2007) iPod users risk premature hearing problems. Telegraph.co.uk. www.telegraph.co.uk/news/uknews/1562410/iPod-users-risk-premature-hearing-problems.html (accessed August 31, 2008).

Also of Interest

"Stereos, MP3s, and Hearing Loss: Interview with Brian J. Fligor, ScD." Log in to www.audiology.org and search key words "MP3s and hearing loss."

"Survey of College Students on iPod Use and Hearing Health," by Danhauer et al, *JAAA* Vol. 20, No. 1 (January 2009). Log in to www.audiology.org and search key word "iPod."

Fligor BJ. (2006) "Portable" music and its risk to hearing health. *Hear Rev* (March). www.hearingreview.com/issues/articles/2006-03_08.asp.

Fligor BJ. (2007) Hearing loss and iPods: what happens when you turn them to 11? *Hear J* 60(10):10–16.

Kean C. (2010) MP3 generation: noise-induced hearing loss rising among children and adolescents. *ENT Today* (January). www.enttoday.org/details/article/554357/MP3_Generation_Noiseinduced_hearing_loss_rising_among_children_and_adolescents.html.

Kleinschmit M. (2006) Portable MP3 player ownership reaches new high. *Ipsos*. www.ipsos-na.com/news/pressrelease.cfm?id=3124 (accessed November 2, 2008).

NIDCD (National Institute on Deafness and Other Communication Disorders). (2008) Noise-induced hearing loss. http://www.nidcd.nih.gov/health/hearing/noise.asp (accessed September 1, 2009).

NIOSH (National Institute for Occupational Safety and Health). (1998) Criteria for a recommended standard: occupational noise exposure. www.cdc.gov/niosh/docs/98-126/pdfs/98-126.pdf (accessed September 8, 2008).

Rose B, Lenski J. (2008) The infinite dial 2008: radio's digital platforms. Arbitron Inc./Edison Media Research. www.arbitron.com/downloads/digital_radio_study_2008.pdf (accessed October 20, 2008).

Wang S. (2005) Listen: iPods can damage hearing. *The Heights*. http://media.www.bcheights.com/media/storage/paper144/news/2005/10/03/Marketplace/Listen.Ipods.Can.Damage.Hearing-1007099.shtml (accessed October 26, 2008).

ARC10 IN WITH THE OLD: NEW RESEARCH ON AGING AND HEARING HEALTH

PART 1 OF 2

IN REVIEW

By Larry Humes

It was my pleasure to chair the Academy Research Conference (ARC) 2010 Program Committee, with Robyn Cox, Judy Dubno, Sandy Gordon-Salant, Benjamin Hornsby, and Beth Prieve as committee members, and to chair the actual program on April 14, 2010, as well. The Program Committee put together an excellent slate of presenters, beginning with a broad overview of the problem of age-related hearing loss, and the risk factors associated with this increasingly common disorder, by the conference keynote speaker, Karen Cruickshanks, and then progressing through the auditory system from the periphery to the cortex. It is my additional pleasure to report that ARC 2010 was supported, in part, by a conference grant from the National Institutes of Health (NIH) (R13 DC010934), the Academy's first NIH grant.

In what is hoped to become a regular feature of future ARC meetings, these excellent presentations have been summarized for *Audiology Today* (*AT*) in a series of brief synopses, beginning in this issue with Karen Cruickshanks' presentation on the epidemiology of age-related hearing loss and underlying risk factors, followed by the two presentations on age-related changes in the auditory periphery. For the latter two, Richard Schmiedt presents an overview of his group's work on an animal model of presbycusis and Pam Souza and Kathy Arehart discuss age-related changes in auditory perception, including implications for treatment.

In the September/October 2010 issue of *AT*, the remaining four presentations will be summarized, including two on age-related changes in the auditory portions of the central nervous system, with Robert Frisina focusing on neurobiological changes in animal models and Kelly Tremblay describing observed deficits in the responses evoked by complex sounds in the central pathways of humans. That issue of *AT* will conclude with two presentations concerning age-related changes in higher levels of processing, including cognitive and linguistic processing, with summaries by Mitchell Sommers and Kathy Pichora-Fuller.

On behalf of the ARC 2010 Program Committee, I hope you find these brief summaries of value. I believe you will find each to provide a reasonable summary of the presentation of information that may assist you in your research or in your clinical work with older adults. If they pique your interest, as I'm sure they will, they should also provide a gateway to additional, more detailed sources of information on each topic.

Larry E. Humes, PhD, is a distinguished professor, Department of Speech and Hearing Sciences, Indiana University, Bloomington, IN. Dr. Humes was the chair for ARC10 and the principal investigator for the conference grant. He received one of the American Academy of Audiology's 2010 Presidential Award for service to the Academy.

AGE-RELATED HEARING LOSS: DEMOGRAPHICS AND RISK FACTORS

By Karen J. Cruickshanks

The project described was supported by R37AG11099 from the National Institute on Aging and R01AG021917 from the National Institute on Aging, National Eye Institute, and National Institute on Deafness and Other Communication Disorders. The content is solely the responsibility of the authors and does not necessarily reflect the official views of the National Institute on Aging or the National Institutes of Health.

Age-related hearing loss (ARHL) has been recognized as a problem for older adults since the ancient Egyptians and Greeks (Ptah-Hotep and Hippocrates), but with the aging of baby boomers, a large number of adults will be at risk for hearing loss and need hearing health-care services. The patterns of ARHL in populations can provide important evidence that ARHL is at least partially preventable if there is variation in the rates

of disease by characteristics such as gender, race or ethnicity, time, geographic location, or other exposures/behaviors.

Population-based epidemiological studies have demonstrated that the prevalence of ARHL is high, affecting 46 percent of adults over age 48, and the incidence is high as well with 1 in 25 older adults developing ARHL in a five-year period (Cruickshanks et al, 1998 and Cruickshanks et al, 2009). Other epidemiological studies have reported that African Americans and Latinos may be less likely to have ARHL than non-Hispanic whites (Agrawal et al, 2008; Cruickshanks et al, 2010).

Early epidemiological studies by Rosen and his colleagues demonstrated that rural Africans maintained good hearing thresholds at older ages, perhaps because of their quieter environment, low prevalence of hypertension, and healthier lifestyles (Rosen et al, 1962). He later studied ARHL in countries with high and low rates of cardiovascular disease (CVD), and ARHL was more common in areas with high rates of CVD compared to those with low rates of CVD (Rosen and Olin, 1965; Rosen et al, 1970). Finally, he added hearing testing to a dietary trial to lower cholesterol in Finns, and found that a less atherogenic diet appeared to protect, and possibly improve, hearing during the follow-up (Rosen et al, 1970).

Population-based epidemiological studies have demonstrated that the prevalence of ARHL is high.

More recent epidemiological studies have added to the evidence that cardiovascular disease, its risk factors such as smoking and lower socioeconomic status, and diabetes may be associated with ARHL (Cruickshanks et al, 2010). However, not all studies have found consistent results, perhaps because of differences in selection criteria for study subjects, measures of ARHL, or analytic methods. Nonetheless, there is fair evidence that vascular factors are associated with ARHL although longitudinal data are needed to confirm these patterns.

Taken together, the data reviewed support the notion that ARHL is not a necessary and inevitable consequence of aging, but like heart disease and dementias, have multiple determinants. Genetic factors also are important, and several groups have found suggestive regions in recent genetic studies (DeStefano et al, 2003; Huyghe et al, 2008; Friedman et al, 2009; Raynor et al, 2009). Nonetheless, identifying the modifiable lifestyle factors associated with the development of ARHL might lead to effective interventions more quickly than gene-based approaches.

One key piece of evidence that ARHL is preventable comes from a recent paper by Zhan et al (2010), which demonstrated that the age-specific prevalence of ARHL declined for people born between 1905 and 1964. For each five years later in birth, men were 13 percent and women were six percent less likely to have ARHL than people born in earlier periods. Thus, the age-specific prevalence of ARHL in men was almost 50 percent lower for baby boomers born in the 1950s than men born 20 years earlier. This birth cohort pattern is a type of temporal change and likely is due to modifiable exposures/behaviors as genetic changes occur more slowly.

Comparing participants ages 50–59 who were examined in 1993–95 as part of the Epidemiology of Hearing Loss Study and similarly aged participants during 2005–2008 in the Beaver Dam Offspring Study, we know that the use of lipid-lowering statin medications has increased from 3.4 to 21.1 percent, total cholesterol levels are lower (236 vs 208 mg/dl), and smoking rates are lower (56.5 vs. 49.2 percent).

While we do not know if these cardioprotective changes have contributed to the lower prevalence of ARHL in more recent generations, it is possible that

changes made to prevent other disorders of aging may have the unexpected side effect of helping to preserve hearing as we age. Although much work remains to be done to understand why hearing worsens with aging, the epidemiological evidence to date shows there is significant variation in the rates of ARHL by characteristics such as gender, race, or ethnicity; time; geographic location; and other exposures or behaviors, providing exciting directions for future research as we work to improve hearing health for tomorrow's older adults.

Karen J. Cruickshanks, PhD, is a professor with the Department of Ophthalmology and Visual Sciences and Department of Population Health Sciences, School of Medicine and Public Health at the University of Wisconsin, in Madison, WI.

References

Agrawal Y, Platz EA, Niparko JK. (2008) Prevalence of hearing loss and differences by demographic characteristics among US adults. *Arch Intern Med* 168:1522–1530.

Cruickshanks KJ, Wiley TL, Tweed TS, Klein BE, Klein R, Mares-Perlman JA, et al. (1998) Prevalence of hearing loss in older adults in Beaver Dam, Wisconsin. *Am J Epidemiol* 148:879–886.

Cruickshanks KJ, Nondahl DM, Tweed TS, Wiley TL, Klein BEK, Klein RK, et al. (2009) Education, occupation, noise exposure history and the 10-yr cumulative incidence of hearing impairment in older adults. *Hear Res* October 22,. Epub ahead of print.

Cruickshanks KJ, Zhan W, Zhong W. (2010) Epidemiology of age-related hearing impairment. In: *The Aging Auditory System: Perceptual Characterization and Neural Bases of Presbycusis*. Gordon-Salant S, Frisina R, Popper AN, Fay RR Eds. New York: Springer, 259–274.

DeStefano AL, Gates GA, Heard-Costa N, Myers RH, Baldwin CT. (2003) Genomewide linkage analysis to presbycusis in the Framingham Heart Study. *Arch Otolaryngol Head Neck Surg* 129(3):285–289.

Friedman RA, Van Laer L, Huentelman MJ, Sheth SS, Van Eyken E, Corneveaux JJ, et al. (2009) GRM7 variants confer susceptibility to age-related hearing impairment. *Hum Mol Genet* 15;18(4):785–796.

Huyghe JR, Van Laer L, Hendrickx JJ, Fransen E, Demeester K, Topsakal V, et al. (2008) Genome-wide SNP-based linkage scan identifies a locus on 8q24 for an age-related hearing impairment trait. *Am J Hum Genet* 83(3):401–407.

Raynor LA, Pankow JS, Miller MB, Huang GH, Dalton D, Klein R, et al. (2009) Familial aggregation of age-related hearing loss in an epidemiological study of older adults. *Am J Audiol* 18(2):114–118.

Rosen S, Olin P. (1965) Hearing loss and coronary heart disease. *Arch Otolaryngol* 82:236–243.

Rosen, S, Olin P, Rosen HV. (1970) Dietary prevention of hearing loss. *Acta Otolaryngol* 70:242–247.

Rosen S, Bergman M, Plester D, El-mofty A, Satti MH. (1962) Presbycusis study of a relatively noise-free population in the Sudan. *Ann Otorhinol Laryngol* 71:727–743.

Rosen S, Preobrajensky N, Tbilisi SK, Glazunov I, Tbilisi NK, Rosen HV. (1970) Epidemiologic hearing studies in the USSR. *Arch Otolaryngol* 91:424–428.

Zhan W, Cruickshanks KJ, Klein BEK, Klein R, Huag GH, Pankow JS, et al. (2010) Generational differences in the prevalence of hearing impairment in adults. *Am J Epidemiol* 171:260-266.

Also of Interest

ARC 2010 PowerPoint presentations are available online.

ARC 2011 takes place in Chicago, April 6, the first day of AudiologyNOW!® Mark your calendars for this event focusing on the evaluation and treatment of tinnitus.

www.academyresearchconference.org

AGING AND THE AUDITORY PERIPHERY

By Rick Schmiedt

Age-related hearing loss, as its name implies, refers to hearing loss (HL) that comes about solely because of age. For the audiologist, human clinical observations and interpretations are complicated by previous exposures to noise, ototoxic drugs, diet, other life-style choices, and genetics. Recent results obtained from nonmutant animal models are now helping us understand how the cochlea declines with age in a controlled environment. Other animal models have shown us the anatomical and functional deficits that occur after exposures to noise and drugs. Can we use the different animal models to help us ascertain more clearly the human condition from audiological tests such as the audiogram? We believe it is now possible to do just that.

In short, noise and drug injuries are largely confined to the outer hair cells (OHCs) that form the basis of the cochlear amplifier. Yes, there is some random loss of OHCs with age, even in non–noise-exposed animal models; however, the models have shown that presbycusis is typically not a sensory problem. In quiet-raised animal models, many show the greatest age-related OHC losses in the apical (low-frequency) region of the cochlea, rather than at high frequencies where it is normally seen in humans, especially after noise and drug exposures.

Not much appreciated until recently is that aging is more likely to affect the power supply to the cochlear amplifier; that is, the 90 mV endocochlear potential (EP) found in the scala media fluid (endolymph). This DC potential is maintained by cells within the lateral wall and the stria vascularis. Because of their high metabolic rate, aging preferentially kills off these cells, gradually reducing the EP from 90 mV down to 60–30 mV throughout the cochlear duct. This latter scenario essentially describes metabolic presbyacusis.

So how does the reduced EP affect HL? It turns out that the cochlear amplifier is exquisitely sensitive to the EP in a manner dependent on cochlear place. In the cochlear base, the relationship is at least 1 dB HL per 1 mV decline in EP, and the cochlear amplifier can have a gain of between 50–70 dB at high frequencies. In the apex, the amplifier is less sensitive to changes in EP and has a total gain of and about 20 dB. Putting these results together yields the classic audiogram configuration seen with pure age-related hearing loss: a flat loss between 10 and 30 dB up to about 1 kHz, coupled with a gradually increasing loss at higher frequencies.

What about suprathreshold tests? It is well-known that OHC lesions severely reduce or eliminate cochlear nonlinearities such as otoacoustic emissions (OAEs). But in animal models of metabolic presbyacusis, emissions are reduced somewhat, but they are very much still present. Thus, another delineator between sensory and metabolic presbyacusis is the absence or presence of OAEs, respectively.

Putting this all together suggests the following interpretations of audiogram configurations with regard to age-related hearing loss. First, normal low-frequency thresholds coupled with a sharp transition to a high-frequency HL of between 50–70 dB are the result of substantial OHC lesions in the cochlear base. Moreover, OAEs at high frequencies in the region of OHC loss will be largely absent but should be robust at low frequencies. These results strongly suggest sensory presbyacusis with a demographic of more males than females.

Second, a mild flat 10–30 dB HL below 1 kHz coupled with a gradually increasing loss at higher frequencies is indicative of EP reduction, not OHC loss. OAEs in this case should be reduced but still present across frequency. These results strongly suggest metabolic presbyacusis with a demographic of more females than males and advanced age.

And third, a mild flat HL below about 1 kHz combined with a sharp loss at higher frequencies is suggestive of a

AGING, AUDITORY PERCEPTION, AND HEARING AIDS

By Pamela Souza and Kathryn Arehart

A longstanding body of research demonstrates that older listeners have more difficulty hearing speech in noise and that this difficulty is due in part to reduced audibility that accompanies peripheral threshold changes. However, recent work shows that older adults without significant hearing loss also have difficulty recognizing speech in the presence of other talkers. For example, we found that compared to younger listeners, older listeners required a larger signal-to-noise ratio to understand speech-in-speech task, and reported that they had more difficulty hearing in such situations in their daily life, even when those listeners had normal or near-normal audiograms.

We have explored the possible role fine structure might play in age-related changes in speech perception. The ability to separate a target and competing speech

combination of the above configurations. Obviously, OAEs will be largely absent at high frequencies in areas of OHC loss but may still be present at low frequencies. These results denote a combination of both sensory and metabolic presbyacusis with a demographic of more males than females and advanced age.

Evidence to support these hypothesized configurations and related changes in auditory function may be found by analyzing our large database of audiometric tests of older adults participating in an ongoing longitudinal study of age-related hearing loss. Those studies are ongoing (see Humes and Dubno, 2010; Schmiedt, 2010).

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References

Humes LE, Dubno JR. (2010) Factors affecting speech understanding in older adults. In: Gordon-Salant S, Frisina RD, Popper AN, Fay RR, eds. *The Aging Auditory System: Perceptual Characterization and Neural Bases of Presbycusis*. New York: Springer, 211–257.

Schmiedt RA. (2010) The physiology of cochlear presbyacusis. In: Gordon-Salant S, Frisina RD, Popper AN, Fay RR, eds. *The Aging Auditory System: Perceptual Characterization and Neural Bases of Presbycusis*. New York: Springer, 9–38.

signal depends, in part, on the ability to perceive fine structure. Fine structure refers here to the ability of the auditory system to resolve low-frequency harmonic cues. Among other things, fine structure provides cues to voice pitch and for tracking intonation. When there are multiple talkers, the ability to perceive voice pitch enables us to follow one talker in the presence of another—exactly the situation that older listeners are

reporting. Accordingly, we explored fine structure perception by older listeners as a possible source of reduced speech-in-speech perception (Souza et al, submitted; Arehart et al, in press).

We reasoned that in a real conversation, listeners would have to detect differences in voice pitch between talkers, track voice pitch over time, and follow one talker in the presence of another talker. Accordingly, in our first task, the fundamental frequency (F0) difference limen was measured for vowels. In the second task, listeners relied on variations in F0 to judge intonation. In a third task, listeners were asked to identify competing vowels where the F0 separation between concurrent vowels was varied.

For all tasks, three conditions were created: (1) vocoding, which preserved periodicity cues to F0 but eliminated fine structure; (2) a simulated electroacoustic condition, which consisted of high-frequency vocoding combined with low-pass filtered speech and offered both periodicity and fine-structure cues to F0; and (3) an unprocessed condition.

Results showed that older listeners had more difficulty distinguishing between voices that were similar in pitch and had more difficulty tracking voice pitch over time. When there were two competing voices, separation of the voices in pitch was more helpful to the younger listeners than the older listeners. All of the younger listeners were able to use fine structure to improve performance (relative to the vocoded condition), but some older listeners were not.

We next reviewed data on device settings for older listeners. We expected that older listeners who were less sensitive to fine structure might rely to a greater extent on envelope cues to speech. We know that older listeners' performance is poorer with more extreme compression settings, particularly for low-redundancy speech (Jenstad and Souza, 2007). Other investigators found that some older listeners performed more poorly with fast-acting than with slow-acting WDRC, particularly in noise (Gatehouse et al, 2006; Lunner and Sundewall-Thoren, 2007). Critically, that work also pointed out that the determining factor was not age per se but reduced cognitive ability, which may accompany aging.

We can summarize the work in this area as follows. As a group, older listeners have poorer perception of fine structure, although there is also variability among older listeners. This likely makes them more susceptible to distortion of the speech envelope by signal processing such as WDRC. It is unclear whether this is due to peripheral deficits, such as reduced neural synchrony, or to a change in higher-level cognitive processes. It is possible that older adults with higher cognitive ability may be able to compensate for peripheral distortion.

With regard to hearing aid settings, a conservative approach is to simply avoid envelope distortion (from fast-acting or high compression ratios) in older listeners. Indeed, some hearing aid manufacturers have already adopted this approach in their fitting software. However, this means potential loss of improved audibility for those older listeners with tolerance for envelope distortion. Instead, our work suggests a different direction: to identify the factors that underlie variability among older listeners. A better understanding of the variability among older adults with hearing loss may guide development of tests that identify individuals who cannot benefit from "standard" device parameters. With that information, we could fit a hearing device as part of a comprehensive rehabilitation plan that considers individual peripheral and cognitive abilities. Such tests are not yet available, but our work in that area continues.

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References

Arehart K, Souza P, Miller C. (in press) Effects of age on F0-discrimination and intonation perception in acoustic and simulated electroacoustic hearing.

Arehart K, Souza P, Miller C. (submitted) Effects of age on concurrent vowel perception in acoustic and simulated electroacoustic hearing.

Jenstad L, Souza P. (2007) Temporal envelope changes of compression and speech rate: the combined effects on recognition for older adults. *J Speech Hear Res* 50:1123–1138.

Gatehouse S, Naylor G, Elberling C. (2006) Linear and nonlinear hearing aid fittings—2. patterns of candidature. *Int J Audiol* 45:153–71.

Lunner T, Sundewall-Thorén E. (2007) Interactions between cognition, compression, and listening conditions. *J Am Acad Audiol* 18:604–617.

Advocacy: What Is That?

Kari Morgenstein

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Why Audiology? For many years, I have worked with children with various disabilities and been passionate about helping others. Audiology is a field that will allow me to use my passion for helping others and to make a difference in the lives of many people.

Role Models: My parents.

Quote to Live by: "When you do the common things in life in an uncommon way, you will command the attention of the world."
—George Washington Carver

What does it mean to advocate? I think when students hear the word advocacy they think of talking to a congressional representative or marching to the Capitol. There is more to advocacy than that. The best thing about advocating is that it does not take an enormous amount of time to be effective. So, why is it that students and professionals don't take just a few minutes to send an e-mail or inform a patient on the issues in our field? Maybe the answer is simple—we all think someone else is doing it. That assumption, however, is not correct; not enough people are active in advocacy. Too many times, people look to others to take action. In the end, no one's voice is heard. As Gandhi said, "You must be the change you wish to see in the world."

How do we, as students, take action? It begins with being aware of the issues and being educated on them. This does not mean we need to obtain a law degree or know the minute details of all issues pertaining to audiology. It means that we should be up to date on key issues that affect our profession and patients. Spending a few minutes on the Academy's Web site is a good place to start. There are brief descriptions on legislation and updates on current issues as well.

To get started, choose two key issues that interest you and take action. You can log on to the Academy's Legislative Action Center (http://capwiz.com/audiology/home) and, in less than three minutes, your letter is on its way via e-mail to your representative. It is that easy! Also, you can inform your patients by explaining the issues, providing them with the contact information for their representatives, and encouraging them to write or e-mail their representative. Patients can easily advocate and send a letter through the Academy's consumer Web site, www.howsyourhearing.org.

You can also arrange a meeting with your representative. Grab another student in your program, a professor, or patient, and give it a try! When meeting with a representative, it is important to not only show why passing certain bills is crucial and beneficial for the representative's constituents, but also for him- or herself personally, along with his or her family members, who might have or develop a hearing loss.

I know it is rather cliché, but true—we are the future of audiology. Audiology is a rapidly changing profession, and if students, audiologists, and our patients take action now, we can make a positive impact on our field for many years to come. By taking action today, we can all create the change we wish to see in the world!

Securing the Future of Audiology

Dustin Richards

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Current School: 2nd-year AuD student, University of Arkansas for Medical Sciences, Little Rock, AR

Future Plans: At this point, it is difficult to tell, but I would say that the ultimate goal is private practice. Regardless of the setting, I want to ensure that no knowledge accumulated over my academic tenure is wasted. I will be an activist for the field of audiology.

Favorite Sports Teams: Los Angeles Lakers, Chicago Cubs, Green Bay Packers, and the Arkansas Razorbacks

Quote to Live by: "If a great thing can be done, it can be done easily, but this ease is like the ease of a tree blossoming after long years of gathering strength."
—John Ruskin

Audiology students know too well the sheer amount of straining it takes to commit knowledge and procedures to memory in the clinic and classroom. It is important to have a vast base of knowledge at your disposal upon entering the field as a professional. Reasoning cannot occur without such knowledge. This knowledge should not be seen as a barrier standing in the way of your desired outcome (hopefully an "A"), rather it should be seen as an opportunity to further extend your professional ability. All of this is important, but I believe that professionals and students alike are neglecting a deeper issue.

When was the last time (or even the first time) that you put a lot of thought into the future and well-being of the field? Dr. Kris English, past president of the American Academy of Audiology, recently noted a particular instance where thousands of audiologists had access to a tool that allowed for an already written letter to be sent to Congress protesting medical reimbursement cuts with just one click of the mouse. Out of thousands of audiologists, only one percent put forth what amounts to roughly 15 seconds to use the tool. If you happen to be an avid supporter of reimbursement cuts, the point still remains. This same scenario has occurred on less divided issues, such as direct patient access. It makes little sense to devote so many hours, resources, and our non-gray hairs to becoming experts on hearing, and yet show apathy toward the longevity of the field itself. The hard-of-hearing population continues to grow, but the ratio of the treated to those who remain untreated seems to remain stagnant. The best way to ensure that this changes is to secure the future of audiology, because helping those who remain untreated is what we have committed our livelihoods to. It is what we have worked so hard to be good at.

At the conclusion of our studies, we will have accumulated an enormous amount of knowledge on the function and care of hearing. That is what will make us students hearing experts. If apathy continues to prevail, though, current audiology students may live to see the day where nonhearing health-care professionals manage hearing health care. I call to all of my fellow students to become advocates of audiology before even entering the profession. If you are not made aware of current professional issues in the classroom, take the initiative to do it on your own, for the sake of yourself—and more importantly—for those people we are being trained to help. Eventually, we will have the knowledge and skills to assist the hard of hearing. Take the steps to ensure that our ability to provide such service is never taken away.

My Best Day in Audiology

New this year at AudiologyNOW! 2010 (April 14–17) in San Diego was a memory wall where attendees shared experiences and events about their best days in audiology. Here are the postings from that wall. We look forward to seeing you in Chicago for AudiologyNOW! 2011, April 6–9.

Standing in the operating room and realizing I was now part of a cochlear implants team! A total best day.

Helping my first three-year-old with hearing aids. Nothing like looking into those big blue eyes.

The first day I turned the key in the door of my own office.

The first day I worked as a licensed audiologist. Realizing that I can make a difference. I have been living that day over and over for the past 14 years.

Michelle, MA

When a lady in a SNF labeled as "demented" and "unable to communicate" suddenly smiled and began conversing after being fitted with hearing aids.

John,
San Diego, CA

A man with tears in his eyes said, "I had no idea what I was missing." Had AN removed from one ear and hearing loss in the other ear.

When I heard Gordon Hempton's sounds.

The patient who cried at the realization that she could be helped to hear again no matter what her doctor had been telling her for years.

Allen, AR

When a patient went from red-faced angry about his hearing loss to "I can do this."

When I fit my mom with new hearing aids, and she cried and told me it was the first time in her life she's ever felt normal.

Tears of joy in my office. Random hug from a stranger who stopped me on the street, hugged me to thank me for giving her husband back!

Humanitarian trip to Vietnam—I will never forget the children at the school for the Deaf in Lai Thieu. Also teaching sign language to a three-year-old Indian girl and her mom in Kuwait.

Dawn, Canada (currently in Saudi Arabia)

Having a seven-month-old baby with bilateral atresia attend to my voice after fitting him with a bone conduction aid. And the first time I signed "AuD" after my name.

Troy, CA

When a patient returned for his first check-up and said he had "heard birds sing for the first time in 20 years."

When Janelle decided to come to the VA, and then Kim did as well.

When my patient/student was mainstreamed and subsequently received a full scholarship to college and subsequently became a teacher and was then accepted as a PhD candidate…by the way, they said she would never be able to talk!

When a 65-year-old patient, with profound hearing loss in one ear and 70 db loss in the other ear said that he "never knew birds chirped differently" after he was fitted with a digital aid (having worn analog aids for 60 years).

Bob, NJ

Telling the parents of a multiple handicapped baby that their son had normal hearing without having to sedate him for the ABR.

Sue, NY, NY

A big smile from a severely dysmorphic child with Treacher-Collins syndrome, who compelled me to kneel and kiss her hand like a princess, and the look of gratitude on her mother's face (we did not speak the same language).

Quitting my ENT job to start my own practice—five years now and things are great!

When I became a private practice owner!

The day I got my AuD.

During a mission trip to Peru, I fitted a hearing aid on a three-year-old boy. When he heard voices for the first time, he began dancing!

When a lady said, with tears streaming down her face, "I thought I'd never hear like this again."

Jennifer, Houston, TX

When a mom e-mailed me that her CI daughter said her first word, "up." (Followed two weeks later by "no" and "moo." She is a champion Moo-er.)

Susan, Las Vegas, NV

When my patient was accepted in the most important university of Mexico in medicine.

Making a grown man cry...with the gift of hearing.

KHD, Tampa, FL

When I proved to ENT residents that impedance audio could really tell what was going on in the middle ear.

When a 10-year-old girl plugged her Nintendo game into her Bluetooth device and started dancing. She'd never heard the sounds before.

TX

Doing an FM fitting with my best friend and Mentor—DPJ.

Janelle K – Pittsburgh, PA

When my patient ran back into the clinic with tears in his eyes saying, "I forgot how beautiful the birds sound!"

The day a five-year-old with traumatic hearing loss loved her hearing aid so much she wanted one for her "dead" ear as well.

When my cochlear implant patient, who had been hit by a car and required extensive physical rehab, commented that she was glad she got her CI before the accident because it gave her the ability to communicate with doctors and family and probably made recovery possible.

Cada dis de trabajo en audiologia es siempre me melor dia.

Jacqueline, Columbia

The day my patient's husband thanked me for giving him back his lovely wife.

Gloria Coeur d'Alene, ID

When a daughter said, "You gave us our dad back."

Chris, RI

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MEMBER BENEFITS

Improved Monitoring for Cisplatin Ototoxicity

By Tiffany G. Baker and Lisa L. Cunningham

Cisplatin-induced ototoxicity causes high-frequency, progressive hearing loss in both adult and pediatric patients. In addition, the ototoxic effects of cisplatin can limit the dose and/or the duration of treatment that a patient may receive. Several grading scales have been established as tools for evaluating ototoxicity in patients undergoing cisplatin therapy. In addition to providing information on ototoxicity in an individual patient, these protocols are useful for developing more effective and less ototoxic treatment protocols, as well as providing a clearer picture of cisplatin-induced ototoxicity across patient populations. This information benefits research aimed at preventing cisplatin-induced ototoxicity. Recently, Chang and Chinosornvatana (2010) outlined a newly proposed grading scale for cisplatin ototoxicity that more accurately predicts audiologists' recommendations for hearing

therapy, including hearing aids. The authors emphasize the need for a grading scale that (1) is sensitive to mild hearing loss at lower frequencies, which may have significant impact on social and educational development in children and (2) provides consistent results across clinics and patient populations. Furthermore, in a recent editorial in *Journal of Clinical Oncology,* Edward A. Neuwelt and Penelope Brock (2010) pushed for an international consensus on assessment criteria for monitoring ototoxicity, especially in pediatric populations, which are particularly vulnerable to adverse effects of hearing loss on speech and language development.

Prior to the development of the newly proposed Chang scale for grading cisplatin-induced ototoxicity, three other grading scales were in place: the National Cancer Institute Common Terminology Criteria for Adverse Events (CTCAE), the American Speech-Language-Hearing Association Ototoxicity Criteria (ASHA), and Brock (Brock et al, 1991) CTCAE assigns a numeric grade (0–4) to indicate hearing status. This system utilizes both quantitative (i.e., hearing thresholds between 1 and 8 kHz) and qualitative (i.e., whether the patient required therapeutic intervention for their hearing loss) assessments of hearing. The most recent version of the CTCAE has added more quantitative elements to this grading system, which was previously somewhat subjective. However, this grading system may underestimate the prevalence of mild hearing loss and therefore may result in underreporting of ototoxicity (Knight et al, 2005; Zuur et al, 2007; Chang and Chinosornvatana, 2010).

The ASHA criteria were established for the purpose of grading hearing loss resulting from ototoxic therapy. In this system, changes in hearing sensitivity are based on information from a baseline audiogram taken before the initiation of cisplatin therapy. Ototoxic hearing loss is then defined as any one of the following: (1) 20 dB change at any one test frequency, (2) 10 dB change at any two adjacent test frequencies, or (3) loss of response at three adjacent test frequencies where a response was obtained during pretesting. An advantage of this system is that (unlike CTCAE) it includes frequencies above 8 kHz, at which cisplatin-induced ototoxicity is often most severe. However, there are potential drawbacks to the ASHA system. First, baseline data are not always available for patients requiring immediate therapy, and this grading system is limited to those patients for whom baseline data are available. Second, because the ASHA system does not assign a numeric grade to indicate the severity of hearing loss, this system is not useful in comparing hearing losses among groups of patients (as in a clinical trial). Over 70 percent of pediatric cancer patients in the United States are enrolled in clinical trials (Tejeda et al, 1996), thus emphasizing the necessity of a numerical grading scale in order to quantify cisplatin-induced hearing loss in these patients participating in clinical trials.

An internationally accepted, standardized grading scale for assessing cisplatin-induced ototoxicity is needed.

The Brock grading scale was established in 1991 specifically for the purpose of evaluating pediatric patients receiving platinum compounds, including cisplatin and carboplatin (Brock et al, 1991). This grading scale is widely used to monitor ototoxicity in clinical trials for children undergoing cancer therapy (Brock et al, 1991; Gupta et al, 2006; Kushner et al, 2006). No baseline audiogram is required, as grades 0–4 are assigned by audiometric testing at 40 dB HL (grade 0 = hearing thresholds <40 dB at all frequencies; grade 1 = hearing threshold ≥40 dB at 8 kHz; grade 2 = hearing threshold ≥40 dB at 4 kHz and above; grade 3 = hearing threshold ≥40 dB at 2 kHz and above; grade 4 = hearing threshold ≥40 dB at 1 kHz and above). This grading system does not distinguish between normal hearing and mild hearing loss (since it assigns grade 0 to any threshold <40 dB), and therefore it can fail to identify a mild hearing loss that can be a significant impairment for a child (Neuwelt and Brock 2010). In addition, the Brock system does not include frequencies higher than 8 kHz and does not include measurements at 3 and 6 kHz (Neuwelt and Brock, 2010),

frequencies that often reveal useful information about cisplatin-induced hearing impairment (Chang and Chinosornvatana, 2010).

Chang and Chinosornvatana (2010) compared their scale to the CTCAE and Brock scales in 134 patients ranging from four months to 24 years of age. They found that while the Brock system is clinically very useful, it sometimes assigned grade 0 to patients who had more clinically significant audiograms than other patients assigned to grades 1 and 2. The newly proposed Chang grading scale is a slight modification of the Brock system that is designed to be more sensitive to mild hearing loss (i.e., between 20 and 40 dB). Although each of the grading systems correlated with audiologists' recommendations regarding amplification, the Chang scale was the most specific predictor of the clinical significance of the hearing loss, especially at higher grades.

The need for an internationally accepted, standardized grading scale for assessing cisplatin-induced ototoxicity is evident. At the 2010 meeting of the International Society for Pediatric Oncologists this fall, an international consensus conference will be convened to further evaluate this important topic and develop standardized recommendations for ototoxicity monitoring in children receiving cisplatin therapy.

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References

Brock PR, Bellman SC, Yeomans EC, Pinkerton CR, Pritchard J. (1991) Cisplatin ototoxicity in children: a practical grading system. *Med Pediatr Oncol* 19:295–300.

Chang KW, Chinosornvatana N. (2010) Practical grading system for evaluating cisplatin ototoxicity in children. *J Clin Oncol* 28:1788–1795.

Gupta AA, Capra M, Papaioannou V, Hall G, Maze R, et al. (2006) Low incidence of ototoxicity with continuous infusion of cisplatin in the treatment of pediatric germ cell tumors. *J Pediatr Hematol Oncol* 28:91–94.

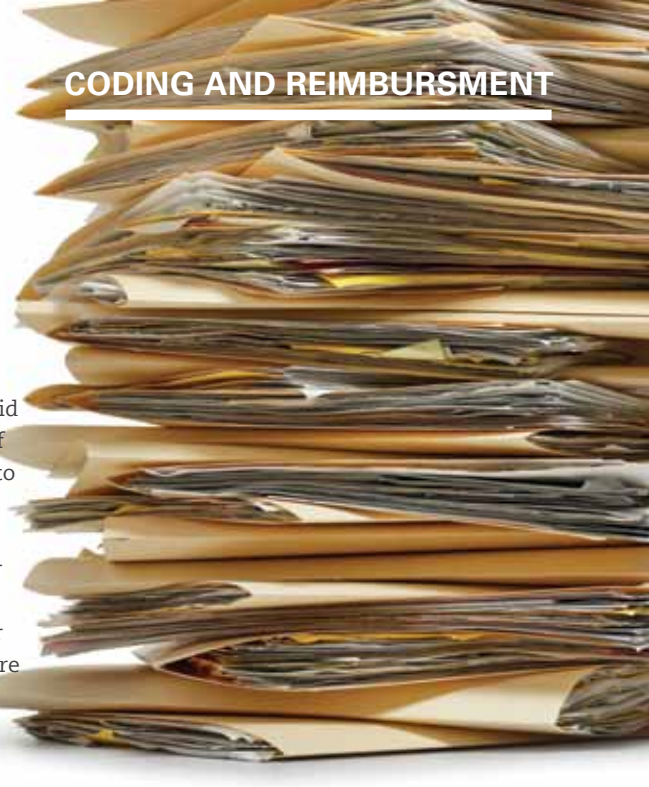
Knight KR, Kraemer DF, Neuwelt EA. (2005) Ototoxicity in children receiving platinum chemotherapy: underestimating a commonly occurring toxicity that may influence academic and social development. *J Clin Oncol* 23:8588–8596.

Kushner BH, Budnick A, Kramer K, Modak S, Cheung NK. (2006) Ototoxicity from high-dose use of platinum compounds in patients with neuroblastoma. *Cancer* 107:417–422.

Neuwelt EA, Brock P. (2010) Critical need for international consensus on ototoxicity assessment criteria. *J Clin Oncol* 28:1630–1632.

Tejeda HA, Green SB, Trimble EL, Ford L, High JL, et al. (1996) Representation of African-Americans, Hispanics, and whites in National Cancer Institute cancer treatment trials. *J Natl Cancer Inst* 88:812–816.

Zuur CL, Simis YJ, Lansdaal PE, Hart AA, Schornagel JH, et al. (2007) Ototoxicity in a randomized phase III trial of intra-arterial compared with intravenous cisplatin chemoradiation in patients with locally advanced head and neck cancer. *J Clin Oncol* 25:3759–3765.



Medicare Claim Filing Update

Due to the Patient Protection and Affordable Care Act (PPACA), commonly known as the health-care reform bill, the Centers for Medicare and Medicaid Services (CMS) has changed the claims filing period to one year for dates of service, effective January 1, 2010. You will no longer have up to 26 months to file a claim to Medicare after the date of service.

Claims after January 1, 2010, will need to be submitted by December 31, 2010. Claims with dates of service on or after January 1, 2010, received later than one calendar year beyond the date of service, will be denied. Services provided before December 31, 2009, will need to be submitted by December 31, 2010, or they will be denied. For further information, look at the Medicare Learning Network publication here: www.cms.gov/MLNMattersArticles/downloads/MM6960.pdf.

Important! Medicare Provider Enrollment Changes

The Centers for Medicare and Medicaid Services (CMS) has changed provider enrollment requirements for referring physicians that could affect your payments. The original date of compliance was to have been January 3, 2011, but claims submitted with non-Medicare-enrolled physicians' National Provider Identifier (NPI) will be denied after July 6, 2010. As of the July date, Medicare claims will be required to have the NPI of the referring Medicare enrolled physician, as well as the NPI of the audiologist providing the service. The referring physician's name should be placed in box 17 of the CMS 1500 form, their NPI in box 17b, and your NPI should be inserted in box 24J.

Updates to the Provider Enrollment, Chain, and Ownership System (PECOS) can be made here: https://pecos.cms.hhs.gov/pecos/login.do. This is a national repository of all Medicare Fee-for-Service providers.

To ensure that your referral sources are enrolled in Medicare, go to www.cms.gov/MedicareProviderSupEnroll/Downloads/OrderingReferringReport.pdf. Physicians who have validly opted out of Medicare are eligible to order and refer for services for Medicare beneficiaries and are in PECOS.

Those employed by the Public Health Service, the Department of Defense, and the Department of Veterans Affairs who refer for services for Medicare beneficiaries are required to have an approved enrollment record in PECOS, even when not submitting claims for Medicare beneficiaries. Pediatricians who have Medicare beneficiaries, such as those children with End Stage Renal Disease (ESRD) and those who are entitled to benefits of other federal programs must also be enrolled.

Also in the final rule for PPACA, CMS is requiring all written and electronic referrals be retained for seven years and submitted if Medicare requests them. Failure to comply will result in a one-year suspension of filing claims to Medicare.

Those who enrolled in Medicare six or more years ago who have not updated their information will need to submit enrollment applications to Medicare or update their information in PECOS. If you prefer to file hard copy, the applicable Medicare provider forms links are here:

For the 855I go to https://www.cms.gov/CMSForms/CMSForms/itemdetail.asp?filterType=dual,%20keyword&filterValue=855I&filterByDID=0&sortByDID=1&sortOrder=ascending&itemID=CMS019477&intNumPerPage=10

For the 855R, to reassign the benefits such as to an employer or contractor, go to https://www.cms.gov/CMSForms/CMSForms/itemdetail.asp?filterType=dual,%20keyword&filterValue=855R&filterByDID=0&sortByDID=1&sortOrder=ascending&itemID=CMS019478&intNumPerPage=10.

CMS 588 form, the *Electronic Funds Transfer (EFT) Authorization Agreement,* was updated in April 2010. If submitting a new or updated enrollment application for your Medicare Provider Transaction Access Number (PTAN), you will also need to refile this authorization agreement.

Medicaid is also requiring the use of NPIs on Medicaid claims. There is no federally required enrollment process for Medicaid providers other than the provider agreements with the state in which you practice if providing services to Medicaid beneficiaries.

Physicians Quality Reporting Initiative (PQRI)—Two Percent Reporting Bonus

Audiologists are strongly encouraged to file claims to Medicare for the measures listed below for either of the reporting periods of January 1, 2010, through December 31, 2010, or July 1, 2010, through December 31, 2010. PQRI participation recognizes audiologists as health-care providers in the Medicare and health-care arenas and focuses on audiology services in the care collaboration process. Eligible measures qualify for a two percent reporting bonus.

- Measure #188: Congenital or traumatic deformity of the ear.
- Measure #189: A history of active drainage from the ear within the previous 90 days (for patients who have disease of the ear and mastoid process).
- Measure #190: A history of sudden or rapidly progressive hearing loss.
- Measure #94, Otitis Media with Effusion (OME): Diagnostic Evaluation-Assessment of Tympanic Membrane Mobility, is not eligible for the two percent bonus, as it is specifically for those aged two months through 12 years, but should be reported if the measure is eligible.

For further information on PQRI, visit www.audiology.org/practice/PQRI.

Questions regarding coding, reimbursement, and/or compliance issues may be sent to Debra Abel, AuD, Academy director of reimbursement and practice compliance, at dabel@audiology.org or 703-226-1024.

2010 HIPAA Updates

The American Recovery and Reinvestment Act of 2009 (ARRA, also known as the "Stimulus Bill") included several HIPAA updates that may pertain to audiology, effective as of February 22, 2010:

- Additional business agreements (BAs) may be required or need to be revised due to HIPAA's expanded coverage for those entities who use personal health information (PHI),
- Breach of data requirements, and
- Notice of Privacy Practices (NPP) should be updated to reflect the change regarding the expediency in providing records to patients.

To order HIPAA resources through the Academy Store, visit www.audiology.org/pages/store and search for key word "HIPAA."

To read more about the HIPAA updates, visit www.audiology.org/practice/compliance.

Also of Interest

Check out the new ICD-10-CM section on the Academy's Web site. Log in to www.audiology.org and search key words "ICD-10-CM."

A Core Value of the Profession: Education

By ACAE Board of Directors

When Dr. Jerger convened the meeting with the founders of the Academy, they recognized that quality education was a basic tenet and foundation of a successful and independent profession. This led to the doctor of audiology (AuD), and a continuing commitment and recognition that education is a core value and pillar of the Academy. Education provides the foundation upon which everything else is built. We could not have achieved our autonomy, legislative successes, and practice independence without our transition to doctoral education.

Yet, are we satisfied with our current audiology educational system? Are we satisfied with the quality of the academic programs training the future of the profession? Are we concerned that there are not enough graduates to meet future demand for services? Are the current standards for audiology education preparing graduates to meet the needs of our patients?

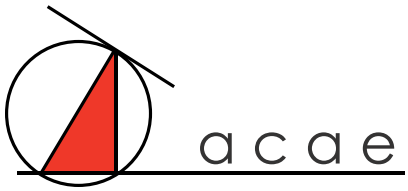
It only is in recent years that doctoral programs have either received or applied for accreditation by the new and more stringent Accreditation Commission for Audiology Education (ACAE). Until we own the educational process and associated standards that undergird the profession, we will have no claim on the educational process or outcomes (e.g., issues such as certification for supervisors, doctoral-entry with degrees other than the AuD, changes in state licensure, changes in the scope of practice, equitable education across programs, etc.). The profession has transitioned to the doctoral degree, but the transition cannot be considered complete until academic programs adopt standards that represent the core values and pillars of our profession.

Since its inception, and with relatively limited resources, the ACAE has been successful in creating a rigorous, cooperative process of accreditation with value-added data for programs and the profession rather than the typical punitive design. Two programs have already completed the ACAE beta version, and a number more have applied for accreditation and are in various stages of the process.

Our work is just beginning. Like anything else that is new, there are early adopters and those who are more cautious. Certainly, this was true with the entire doctoral-education movement. The majority of programs waited many years before transitioning and the majority began offering the doctoral degree only in the last four to five years. Broader acceptance of the new accreditation system developed for AuD programs is not far behind, especially if clinics, hospitals, and practices give priority to externs and graduates of ACAE-accredited programs knowing that they will be working with students from rigorously evaluated programs.

As a profession, we must continue to strive for quality education and standards that are the foundation of our profession. We must be sure that we do not regress to accepting the status quo and be sure that our future remains controlled by audiologists. It is our responsibility to make our commitment to the educational pillar known to the Academy's board, and our alumni academic institutions through letters and actions that will demonstrate our support for quality and equitable educational standards. It is only through rigorous and standardized educational processes, of and by audiologists, that we will become the truly autonomous and well-respected profession that we all desire—and that consumers deserve.

For more information about ACAE, visit www.acaeaccred.org.



For ABA information, contact:
American Board of Audiology
11730 Plaza America Drive
Suite 300
Reston, VA 20190
800-881-5410
aba@audiology.org

Pediatric Audiology Initiative: The Final Phase

The American Board of Audiology, with the assistance of a panel of subject matter experts (SMEs), as well as many audiologists who took time away from their busy practices or research work to respond to the ABA's survey, has completed the practice analysis phase of the pediatric audiology initiative. The ABA is appreciative of the expertise and time of so many audiologists dedicated to the profession and to the children with hearing impairment and their families that the profession is privileged to serve.

In this regard, the ABA would particularly like to recognize and thank the ABA Board's public representative, Patricia (Patty) Keffer, MBA, who has been involved in issues surrounding hearing loss and hearing health since her youngest child,

ABA Board Profile

Patty A. Keffer, MBA

Public Representative, ABA Board of Governors

Patty and her seven-year-old daughter Lydia

Hails from: McLean, VA. Grew up in Akron, OH, and lived in Angers, France, and Chicago, IL.

Degrees: MBA, Northwestern University's Kellogg School of Management

Appointed to Board: January 2010

What I Do for the ABA: My experience raising a daughter with bilateral cochlear implants enables me to share information regarding audiology consumers' needs—especially those of children. My business background equips me to bring financial considerations to mind in advocating for high-quality, cost-effective hearing care. I am also a member of the ABA Marketing Committee.

In My Free Time: I attend my children's many activities as well as volunteer regularly at their school. I am also a Girl Scout leader and enjoy biking, swimming, doing home improvement, visiting relatives, beach vacationing, and taking advantage of what the DC area offers.

Quote to Live by: "We make a living by what we get, but we make a life by what we give."—Winston Churchill

Lydia, was diagnosed as profoundly deaf as a newborn in 2003. Patty's insights and dedication to this initiative have proved invaluable.

In the days ahead, you will be hearing more about the final phase of the initiative and may be called upon by the ABA to play a role in this important project. Thank you in advance for your support of this final critical step.

The American Board of Audiology acknowledges with deep appreciation the expertise and time given to the pediatric audiology initiative by the following:

James Beauchamp, AuD, Chair
Marion Downs, PhD, Honorary Chair

Karen Anderson, PhD
Andrea Bailey, MA
Lindsay Bondurant, PhD
Tamala Bradham, PhD
Judy Elkayam, AuD
Robert Fanning, AuD
Brian Fligor, ScD
Marcia Fort, AuD
Sandra Gabbard, PhD
Alison Grimes, AuD
Melanie Herzfeld, AuD
Lisa Hunter, PhD
Cheryl DeConde Johnson, EdD
Dawna Lewis, PhD
Corinne Macpherson, AuD
Ryan McCreery, MS
Marilyn Neault, PhD
Eileen Rall, AuD
Patricia Roush, AuD
Cindy Simon, AuD
Gail Whitelaw, PhD
Jody Winzelberg, AuD
Christine Yoshinaga-Itano, PhD

The Power of Recognition Is in Your Hands…

2010 AND 2009 ACADEMY HONORS RECIPIENTS

2010

Distinguished Achievement Award
Gail Chermak
Cynthia Compton-Conley
David Hawkins
Sharon Kujawa

Humanitarian Award
Briseida deLeon Northrup

International Award in Hearing
Adrian Davis

James Jerger Career Award for Research in Audiology
Stephen Fausti

Samuel F. Lybarger Award for Achievements in Industry
Elaine Saunders

2009

Distinguished Achievement Award
David Fabry
Robert Keith
Ross Roeser

Humanitarian Award
Aysen Erdil

International Award in Hearing
Stig Arlinger

James Jerger Career Award for Research in Audiology
Sandra Gordon-Salant

Samuel F. Lybarger Award for Achievements in Industry
David Preves

The Academy Honors Committee encourages all Academy members to identify those colleagues they believe have made significant contributions to the audiology profession. If you know someone who should be recognized for his or her efforts, take time to submit a nomination packet to the committee for review. **All nominations must be received by September 24, 2010.**

Nomination Process

To nominate an individual, a nomination packet that includes a letter of nomination addressed to the committee chair and an up-to-date full curriculum vitae of the nominated individual should be submitted by the deadline. Self-nominations will not be accepted. The nomination packet should include sufficient documentation as to how the nominee meets the specified criteria for the selected category. Additional letters (3–5) in support of the nomination and any other documentation that will assist the Honors Committee in their decision are required. Nomination packets will be accepted in hard copy or electronic form. Hard copy packets should be mailed to Academy headquarters and electronic nomination packets may be sent by e-mail to Sarah Sebastian at ssebastian@audiology.org.

Nominations in all categories, except Distinguished Achievement, have a three-year life span, after which an interim of at least one year is required before resubmission. Additional supporting data, if available, should be submitted to the Honors Committee each year a nominee is being considered.

Selection of Honorees

The committee will consider all nominations, and awards will be made to qualified candidates who receive a majority vote of the voting members of the committee pending final approval of the Academy Board of Directors. Not all awards may be given each year. Selected recipients will be presented at AudiologyNOW! in Chicago, IL, April 6–9, 2011.

Guidelines

Nominations should be made in a letter format with a full curriculum vitae and 3–5 letters of recommendation of the candidate enclosed. The nomination and all supporting materials must be received at Academy headquarters by **September 24, 2010**.

Award Categories

James Jerger Career Award for Research in Audiology

This award is given to a senior-level audiologist with a distinguished career in audiology. Candidates must be members of the Academy, have at least 25 years of research productivity in audiology (not a related field), as well as have made significant contributions to the practice and/or teaching of audiology.

Samuel F. Lybarger Award for Achievements in Industry

This award is given for significant pioneering activity (research, engineering, or teaching) within the field of hearing. This award is restricted to individuals whose achievements occurred while employed by a company or corporation in the hearing health-care fields but whose contributions extended beyond their contributions to their company's services or products and served to have a significant impact on the understanding of normal or disordered auditory systems.

International Award in Hearing

This award honors and recognizes the achievements of international significance in audiology by an audiologist, hearing scientist, or audiological physician. Nominees should be nonresidents of the United States who have provided outstanding service to the profession of audiology in a clinical, academic, research, or professional capacity, and be in good standing in their country.

Humanitarian Award

This award is given to an individual who has made a direct humanitarian contribution to society in the realm of hearing. Candidates should have demonstrated direct and outstanding service to humanity in some way related to hearing, hearing disability, or deafness. Candidates should have demonstrated significant and consistent humanitarian contributions, preferably in matters related to hearing.

New! To acknowledge excellence in audiology humanitarianism, the AAAF will make a charitable gift as a tribute to the recipient of this award. The recipient may designate a $1,000 donation to his or her hearing charity of choice.

Distinguished Achievement Award

Recipients of this award may include audiologists who have been exceptional educators in the classroom or clinic, innovative in program development, and pioneering in clinical service delivery, teaching, research, or any combination of these areas. The contributions made by the recipients of this award must have an impact on the profession of audiology as a whole and not just at a state or local level. Recipients must be members of the Academy.

Address the nomination package to:
Brenda Ryals, Chair, Honors Committee
c/o American Academy of Audiology
11730 Plaza America Drive, Suite 300, Reston, VA 20190

Just Joined

New Members of the American Academy of Audiology

Cahtia Adelman, PhD
Mark Bakkum, MS
Wanderleia Blasca, PhD
Cathleen Brueckner, AuD
Sandra Caldwell, MA
Kathleen Campos, MA
Hung-Yue Chang, MS
Brandi Coffin, AuD
Susan Cook, AuD
Katya Freire
Melanie Garner, AuD
Hyunah Jeon, AuD
Wanda Johnson, AuD
Alison Kahn, MA
Vardush Keshishyan, MA
Elizabeth LeBaron, AuD
Ken Madler, MA
Jeffrey Moore, AuD
Jaklin Naghdi, MA
Claudine Palacios, MS
Martine Parekh, AuD
Rene Pedroza, AuD
Melissa Price, AuD
Michelle Quinn, AuD
Kathleen Ryan, AuD
Melissa Santerre, AuD
Jared Teter, AuD
Arturo Villegas, AuD
Carey Williams, AuD
John Young, MA

New Members of the Student Academy of Audiology

Kaori Akashi
Shelby Atwill
Richard Bird
Cori Birkholz
Jillian Blinkoff
Brittany Camillo
Caitlin Chauvette
Sara Davis
Andrea Dunn
Rose Gilani
Katherine Gilmore
Katherine Greening
Kelsey Jackson
Rebecca Jolissaint
Whitney Kidd
Timothy Lim
Josh Luekenga
Clare McClumpha
Kimberly Mentock
Gary Miyasaki
Melissa Mooney
Vanessa Peck
Kimberly Richmond
Christianne Robertson
Jennifer Robinson
Anna Shapiro
Tyler Sorensen
Mark Stevenson
Stephanie Tartaglia
Kristina Thomas
Stacie VanBodegon
Celia Velez Zayas
Trisha Wesely
Colin Wong
Lisa Zagar

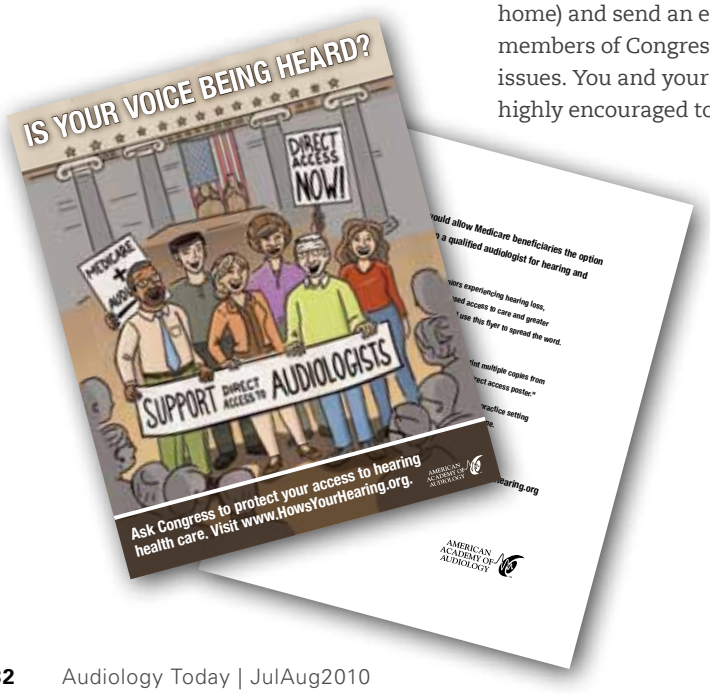
Your Patients Are Critical in Advancing Direct Access

By Melissa Sinden

When you think about who stands to benefit the most from direct access to audiologists, it is clear that the growing number of Medicare beneficiaries experiencing hearing loss will be the true winners. Direct access can mean one less trip to a physician's office, fewer out-of-pocket coinsurance payments, and increased access to care. These benefits, of course, are nothing compared to the greater quality of life that patients enjoy when they receive quality hearing health care from an audiologist.

Doesn't it make sense then that we solicit their help in leading the charge? Audiology is a relatively small profession, and it is easy for our voice to become muted in a sea of larger physician groups with deep pockets and larger memberships. We can no longer rely on audiologists alone to make sure our message is delivered. We need every supporting voice to weigh in with their members of Congress and tell them what direct access would mean to them. The stories from your friends, family, and patients are the ones that congressional representatives take to heart and that serve to shape their opinions on legislation.

During General Assembly at AudiologyNOW!® this year, then-President Kris English, PhD, described how to become a "15-second activist." She demonstrated how quickly you can log on to the Academy's Legislative Action Center (http://capwiz.com/audiology/home) and send an editable letter to members of Congress on a variety of issues. You and your colleagues are highly encouraged to continue to do so, and now patients of audiology can do the same.



By visiting the Academy's consumer Web site (www.howsyourhearing.org), patients can learn more about the advocacy issues that impact the care they receive. Urge your patients to use this site to send a message to their representatives and explain how access to audiological services has improved their lives and why direct access is so critical in ensuring that Medicare patients receive the same standard of care.

Included in this issue of *Audiology Today* is a patient advocacy flyer designed for Academy members to reproduce and place in patient areas of your practice setting. This flyer educates patients and friends of audiology on why direct access is important and how they can help guarantee access to hearing health care.

We hope that you will make these flyers available for your patients to take home with them, generating thousands of 15-second activists. Every e-mail, phone call, and letter truly makes a difference.

You know the life-changing positive impact your care has on patients living with hearing loss. It is time those patients had a voice on Capitol Hill.

Melissa Sinden is the senior director of government relations with the American Academy of Audiology.

AIT Position Statement Open for Peer Review

The *2010 Auditory Integration Training Position Statement* is open for widespread peer review until **July 16, 2010**. Send comments to Task Force Chair Carrie Spangler, AuD, at carrie.spangler@email.sparcc.org. To review the document, visit www.audiology.org and search key words "2010 auditory integration."

AMA SOP Response "Tool Kit" Available Online

Audiology is among 10 provider groups reviewed in the American Medical Association (AMA) *Scope of Practice (SOP) Data Series*. The reports on nonphysician providers were commissioned based on the AMA's concerns that certain professions are expanding their "scope of practice" at the risk of potential harm to the public. Upon the release of the audiologists module, the Academy assembled a task force for its review, and it was determined that the document contained a number of inaccuracies, misstatements, and falsehoods that were not reflective of the profession of audiology.

The stated intent of these reports is "to provide background information for state- and federal-based advocacy campaigns where the health and safety of patients may be threatened as a result of unwanted scope of practice expansions sought by nonphysician providers." As such, the Academy felt it was necessary to develop materials to assist audiologists in educating policymakers on the facts.

The Government Relations Committee created educational materials, which are now available on the Academy Web site. You will find a copy of the Academy task force report, the Academy audiology *Scope of Practice Statement*, and a list of frequently asked questions regarding the AMA *SOP Data Series*, in addition to other helpful tools. These materials are intended for member use to combat any inaccurate information being disseminated to policymakers as a result of the AMA publication. Visit www.audiology.org and search key words "AMA SOP response."

Resume Review Service

You think your resume is done—but is it really? Have you had a professional audiologist review your resume? Does it present your most relevant experience to employers? The only way to know for sure is to ask for qualified feedback. To assist those in the job market, the Academy is offering a FREE resume review service to members. Job seekers can also submit items such as cover letters, curriculum vitaes, and thank-you notes for review. Please allow 7–10 days to have your job materials reviewed.

For more information, visit www.audiology.org and search key words "resume reviews."

Are You Connected to the Academy's Consumer Site?

The Academy's recently launched consumer Web site now features an area on the home page for your patients to "advocate for audiology." Check out the site as we continue to make upgrades and make sure your organization, practice, clinic, or university department is linked to www.howsyourhearing.org.

Members in the News and More

Recently, two Academy members, De Wet Swanepoel, PhD, and Jay Hall III, PhD, were featured on Yahoo Sports and other online publications for their study on the NIHL danger from the blaring vuvuzela trumpets at the World Cup soccer games in South Africa. The Academy posts "members in the news" stories like this on our Web site, Facebook, Twitter, and more. Visit www.audiology.org and search key words "members in the news."

Oticon's Philanthropic Collaboration with AAAF Continues

Oticon, Inc., has been a generous friend of the AAA Foundation for many years. The company has funded the Marion Downs Pediatric Lecture since 2004, and has made several gifts in support of research, education, and public awareness with funds raised through the Hearing with Our Hearts program and other collaborative efforts. At AudiologyNOW! ® 2010, Oticon President Peer Lauritsen announced that Oticon would make a $25,000 gift to the Foundation, thus continuing its tradition of generous philanthropic support. Lauritsen stated, "Oticon is proud to partner with the American Academy of Audiology Foundation on its many educational and service initiatives that benefit people with hearing loss and the people who care for them. Through our support of these activities, we reaffirm Oticon's commitment to always put the needs of people first."

Oticon's Alternative Energy Block Party Benefit was a success, as the company pledged to donate $10 to the Foundation for every audiologist who attended the benefit event, featuring rock bands Cheap Trick and the Infidels. Everyone had a rockin' good time at the sold-out benefit, and best of all, Oticon's gift ensures continued funding for educational projects such as the Student Travel Award Reimbursement (STAR) Program, which funds educational opportunities for graduate students across the United States.

Oticon also kicked off its Mission to Xanthia Expedition at the Foundation Booth at AudiologyNOW! The mission team, led by Jackie Clark, PhD, from UT Dallas, will provide hearing health care to the underserved populations in the Vredefort Dome area of South Africa. In addition to providing hearing aids and supplies for the trip, Oticon will send two humanitarian audiologists to Africa to work on the mission team. Jamie Shumaker and Julie Verhoff were chosen from among hundreds of audiologists who submitted entry forms for the drawing held at the Foundation booth on April 17. Friends of the Foundation can track the progress of the mission as Jamie and Julie provide dispatches from South Africa on the Team Xanthia blog. Visit www.audiologyfoundation.org to access their blog and learn more about this humanitarian partnership.

Oticon also supported the Foundation's Auction 4 Audiology with several donations including a guitar autographed by Cheap Trick, a set of Agil hearing devices, and several plush hearing-service dogs.

Cheryl Kreider Carey, CAE, executive director, thanked Lauritsen and his colleagues from Oticon at AudiologyNOW!, "Oticon has been a generous supporter of the Foundation. Their philanthropy creates opportunities for us to do great things for the profession of audiology and those it serves—thank you!"

Jamie Shumaker, pictured with Foundation Director of Development Kathleen Devlin Culver (front row left to right), celebrates her selection for the Xanthia mission trip with Oticon staff Henning Falster, Mariann Cadieu, and Jim Kothe (back row left to right).

Auction 4 Audiology Raises Over $11,000

They may not have been wearing wetsuits—but there was definitely lots of surfing going on at AudiologyNOW! Convention attendees and cybershoppers across the country surfed the sale in the AAA Foundation's online Auction 4 Audiology running April 5–17.

Over 60 items were displayed at the Foundation Booth including collectibles, electronics, jewelry, and handcrafted art—a special focus this year. New for 2010 was the "Make a STATEment" contest, which encouraged AuD programs and Student Academy of Audiology (SAA) chapters to donate items that showcased their state. We are pleased to announce that the SAA chapter at The University of Texas at Dallas donated the auction item that received the most bids. Their contribution of the one-of-a-kind handcrafted James Jerger doll was a real treasure and was contested in a fierce bidding war! The chapter won a well-deserved night of food, fun, and a break from the books for their great auction item that ultimately raised over $200 for the Foundation.

The highest bid in the auction was $1,525 for the Hamer Vector Flametop electric guitar signed by Cheap Trick and donated by Oticon, Inc. Other popular items included a $1,200 gift certificate to the Ritz-Carlton donated by Lyric Hearing, an 8GB iPod touch donated by Unitron, and a multicomponent vase crafted and donated by John Penrod, a retired audiologist.

When the sun had set on the auction on Saturday, April 17, we had raised over $11,000 to support research, education, and public awareness in the hearing sciences. The auction is one of our favorite benefit events and we thank everyone who bid, donated, or helped make it such a success. If you're interested in donating to the 2011 Auction 4 Audiology, please contact Tara Conte at tconte@audiology.org.

Mindy Brudereck emerges victorious from a fierce bidding war for a crocheted James Jerger doll.

2010 Auction 4 Audiology Donors

Deb Abel
Alabama Academy of Audiology
American Academy of Audiology
American Board of Audiology
American Institute of Balance Education Foundation
AuDBling.com
AudioSync
Auditech, Inc.
John Barker
Judith Blumsack
James Brandess
California Academy of Audiology
Cheryl Kreider Carey
Connecticut Academy of Audiology
CounselEAR, LLC.
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Richard Danielson
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Educational Audiology Association
Etymotic Research, Inc.
Ever-Dry Hearing Aid Saver Co.
M. Patrick Feeney
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Lyric Hearing
Dianne Meyer
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Plural Publishing
Renata Consumer Batteries/Sy Kessler Sales, Inc.
April Ressler
SAA Chapter at Auburn Univ.
SAA Chapter at Missouri State Univ.
SAA Chapter at Univ. of Pittsburgh
SAA Chapter at Univ. of Texas at Dallas
SAA Chapter at Univ. of Washington
San Diego Padres
Sensimetrics Corporation
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Starkey Laboratories, Inc.
TIMS for Audiology
Unitron
Univ. of Mississippi Med. Center
Washington State Academy of Audiology
Westone Laboratories, Inc.
Williams Sound Corporation
Woodturnings by John Penrod

New AAA Foundation Board Members Announced

As of July 1, David Fabry, Karen Jacobs, and Michael Mallahan have begun a three-year term on the Foundation Board of Trustees. Also joining the board is Academy Past-President Kristina English, who will fill a one-year term and serve as liaison to the Academy Board. The Foundation is delighted to welcome this talented group of individuals who will bring their unique perspectives to the board. Ending their terms on the Foundation board are A.U. Bankaitis, Sharon Fujikawa Brooks, and Patrick Feeney. Each made an impact on the Foundation's philanthropic efforts during their term as a trustee and are thanked for sharing their time and talents with their colleagues on the board.

New trustees: **Kris English, PhD**, is a professor at the University of Akron/NOAC, Akron, OH. She earned her undergraduate and master's degrees at San Diego State University and completed her doctoral degree at the consortium program at SDSU and Claremont Graduate University. Her areas of interest include audiological counseling and the art and science of teaching audiology. She

has authored four books and 16 chapters and has given over 150 presentations in the United States, Canada, and Europe. She served as a board member of the Educational Audiology Association for 10 years, including as president in 1997–1998. She has served on the board of the American Academy of Audiology for four years.

David Fabry, PhD, is managing director of Audiosync Hearing Technologies. He is a past president (2001) and board member (1997–2002) of the American Academy of Audiology, past Board member of the American Board of Audiology, and has previously held positions as director of audiology at Mayo Clinic (1994–2002) and the University of Miami (2007–2009). He is currently the content editor of *Audiology Today*. He earned three degrees from the University of Minnesota, a bachelor's degree in psychology (1981), master's in audiology (1984), and a doctoral degree in hearing science (1988).

Current and future Foundation board members at the Foundation's annual on-site board meeting at AudiologyNOW!

Karen Jacobs, AuD, is a private practitioner in Grand Rapids, MI, and owner of AVA Hearing Center, which she started in 1998 following 15 years in an ENT practice. She has been active in the profession, serving recently on the American Academy of Audiology Board of Directors, on the American Board of Audiology Board of Governors, as president of the Michigan Academy of Audiology, and as a volunteer for other national and state organizations in support of hearing health care. She has a BS and an MA from Central Michigan University, and an AuD from the George S. Osborne College of Audiology at Salus University.

Michael Mallahan, AuD, is the director of the Hearing & Balance Lab in Everett, WA, and has been in private practice since 1995. He is regionally recognized for expertise in providing assessment and direction for rehabilitative care for patients with balance disorders. He received his undergraduate and graduate education at Western Washington University and his AuD from A.T. Still University of Health Sciences. His greatest joy is serving children in Guatemala leading medical mission teams through the Healing the Children organization.

The AAA Foundation is incredibly fortunate to have such dedicated volunteers and looks forward to another successful year!

2010 James Jerger Awards for Excellence in Student Research

The AAA Foundation presented each of the following young researchers with a James Jerger Award for Excellence in Student Research at AudiologyNOW! 2010:

Tracy Barsheff, BS
Western Michigan University
Fetal Alcohol Syndrome: Influence on the Ear and Cranial Ganglia

Melody Benedic, BA
Louisiana State University Health Sciences Center
Inter-Aural Differences of Wave V to Click and Speech Stimuli in Children at Risk for (C)APD

Shannon Daniels, AuD
University of Connecticut
Electrophysiological Correlates to Behavioral Gap Detection

Stephanie Nagle, BA
University of Connecticut
Comparing the Diagnostic and Screening Gaps-in-Noise Tests

Each individual received a $500 award funded annually by an anonymous Foundation donor who is committed to the promotion of research in the hearing sciences. For information on how you can support audiology research, contact Kathleen Devlin Culver at 703-226-1049.

From left to right: AAA Foundation Chair Dianne Meyer congratulates James Jerger Award winner Melody Benedic along with Jill Preminger and Jennifer Shinn.

Classified and Employment Line Listing Rates for *Audiology Today*

Up to 50 words	$125
Each additional word	$2

Agency discount not valid for line listings.

Classified and Employment Display Advertising for *Audiology Today*

Ad Rates	1x	6x	12x
Full page	$1,630	$1,425	$1,295
1/2 page	$1,230	$1,015	$900
1/4 page	$880	$760	$730
Full Color			$1,375
2nd Color Matched			$800

Agency discount 10%: valid to advertising agencies only, does not include color.

Contact Christy Hanson at chanson@audiology.org or 703-226-1062 for more information or to place an ad.

HEARCareers

Web Employment Postings

Posting Rates	Members	Nonmembers
Single 30-Day Posting	$245	$290
Single 60-Day Posting	$450	$550
3 Job Postings for 1 Month	$625	$750
5 Job Postings for 1 Month	$980	$1,120

Resume search included with job posting.

Contact Vanessa Scherstrom at vscherstrom@audiology.org for more information.

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APRIL 6–9 2011

CHICAGO

CALL FOR PRESENTATIONS

Share your experience and knowledge with other audiologists. Submit a presentation proposal for AudiologyNOW!® 2011.

The Program Committee is looking for presentation proposals from first-time presenters, seasoned presenters, and everyone in between.

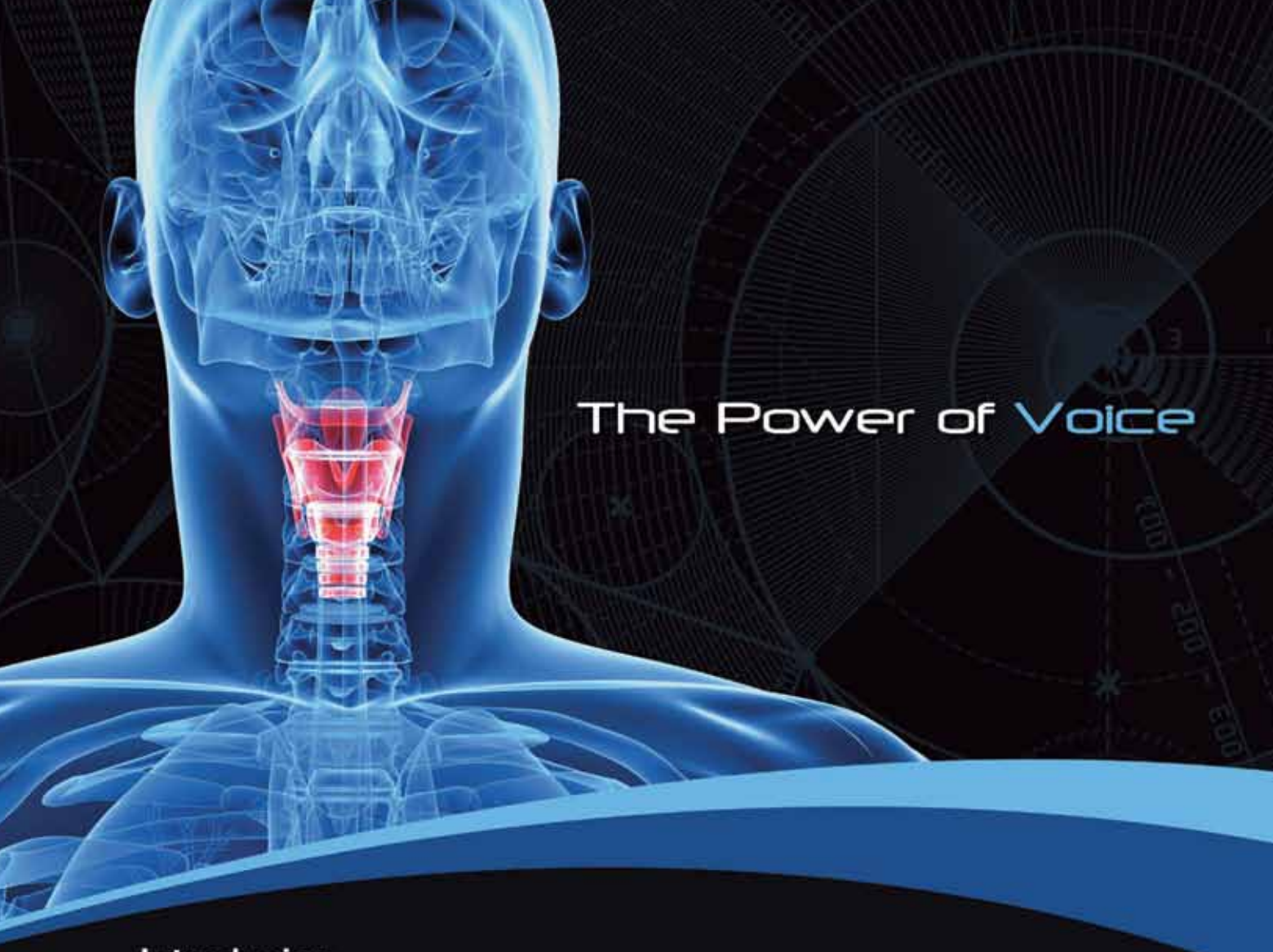
SUPER TRACKS FOR 2011

- Pediatrics
- Vestibular
- Treatment
- Practice Issues
- Neuro-Audiology (with a special emphasis on Tinnitus)

Submit proposals online at www.audiologynow.org starting August 2, 2010.

AudiologyNOW!®

AMERICAN ACADEMY OF AUDIOLOGY



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SpeechPro has already revolutionized the way we fit hearing instruments. Simply talk, and the hearing instrument programs to target in seconds – validated simultaneously with a real-ear speech mapping system.

Now, VCOM gives you the freedom to fit hearing aids using voice commands. VCOM lets you program the hearing device "hands free" so that you can move about the patient and not be stuck behind a computer keyboard and mouse. Besides voice programming, interact with the computer's "Persona" by letting the computer help answer the patient's questions…ie. "Why do I need two hearing aids?" "Will these help in noise?" Or, use VCOM to help train your office staff… "What is auditory deprivation?"… "What is binaural summation?" The options are endless.

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For a limited time order **5** EVoK 900 hearing instruments and receive a Persona Speech Mapping System absolutely **Free**

PERSONA® MEDICAL

Exclusive territories may be available in your area.
VIEW THIS EXCITING TECHNOLOGY AT
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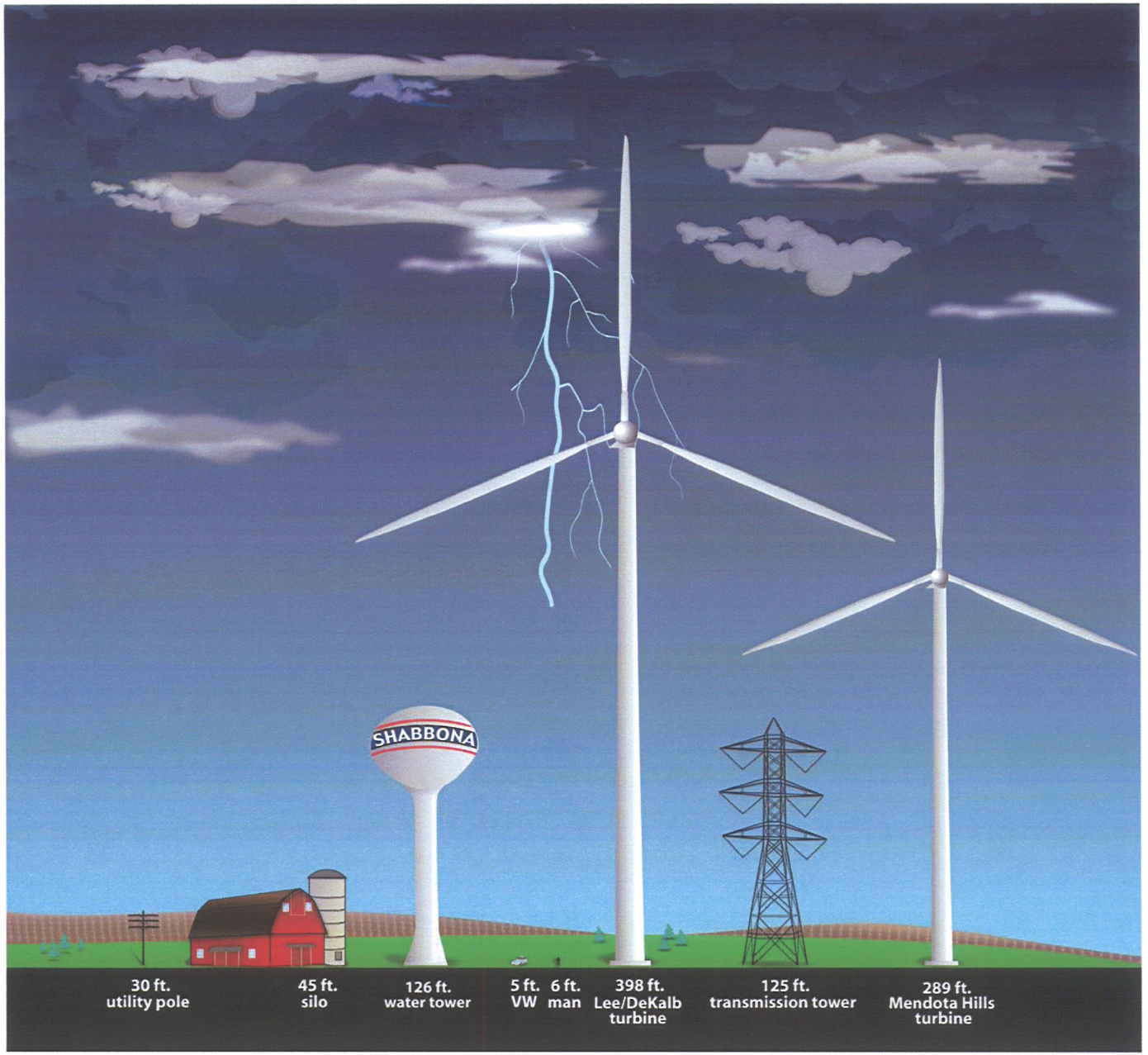
EXHIBIT 2

Mars Hill Wind Turbine Project
Health Effects – Preliminary Findings

- 28 turbines, 389 ft tall
- Online Dec 06, Complete Mar 07
- 20 homes North and East of turbines
- 35 adults, 16 children live within 3400 feet
- 15 people interviewed (13 face to face Mar 12, 2009) to date

Michael A. Nissenbaum, MD, *presentation to Maine Medical Association March 2009*


SHABBONA
30 ft.
utility pole
45 ft.
silo
126 ft.
water tower
5 ft.
VW
6 ft.
man
398 ft.
Lee/DeKalb
turbine
125 ft.
transmission tower
289 ft.
Mendota Hills
turbine

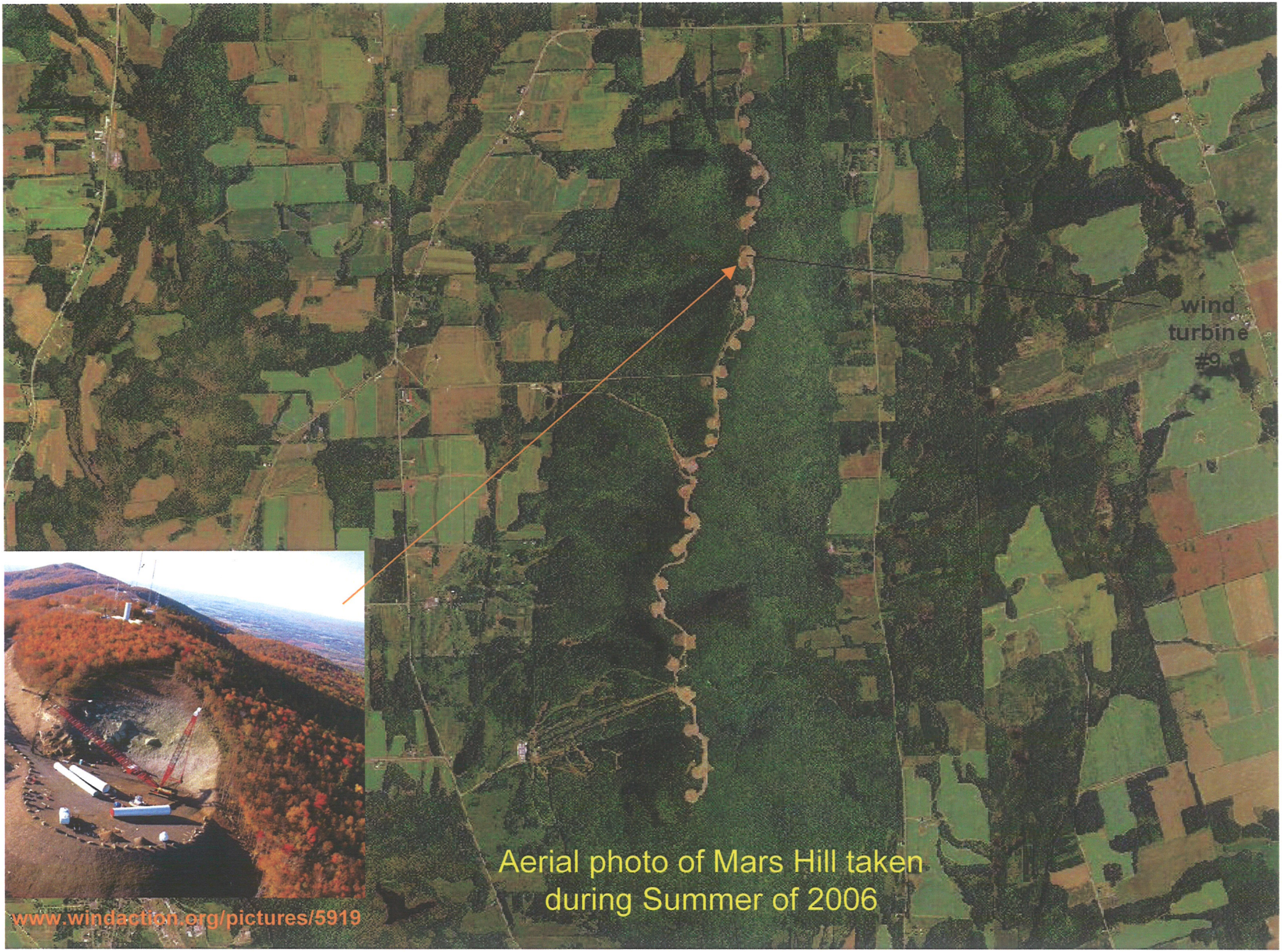
Locations of 28 wind turbines (red dots) and 2 meteorological towers (gold dots), based on coordinates included in the FAA's 7460-1 database for the Mars Hill windplant, Aroostook County, ME.

wind turbine #9

Courtesy Dan Boone

Mars Hill's North End - East Ridge Road

Michael A. Nissenbaum, MD, March 2009



Aerial photo of Mars Hill taken
during Summer of 2006

www.windaction.org/pictures/5919

Mars Hill Experience

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Questionnaire Used

Name	Age	Turbine Dist.	Years here	Occupation	Telephone #	email

Information provided by: Address:

Pre existing medical conditions or diagnoses:				
Medications prior to WTP:				
New medical conditions or diagnoses since WTP:				
New medications or dose changes since WTP:				

Sign/Symptom	Frequency/Severity	Freq/Sev PRIOR to WTP	Improves when away?	Seen a doc? New Rx or Tx?	Comment
Sleep disturbance:					
Difficulty falling asleep:					
Waking up mid. of night:					
Headaches ☐ Migraines ☐					
Dizziness					
Ears ringing					
Balance probs					
Unusual body sensations (specify):					
Weight: gain ☐ loss ☐					
Palpitations					
Changes in appetite (spec):					
Feelings of 'Stress'					
Feelings of 'Anger'					
Feelings of 'hopelessness'					
Feelings of 'anxiety'					
Feelings of 'irritability'					
Feelings of 'Depression'					
Other					

1. Has your quality of life been altered in any way since the wind turbine project went online?
2. How so?
3. Have you considered moving away?
4. Why haven't you moved away?

I understand and consent to this information being collected as part of a medical investigation. I understand no names shall be used in any report generated with this information, and that no patient names will be released at any time. The report or excerpts from the report may be presented to government or to other bodies such as the Maine Medical Association, and may be published in journals or other media.

_____ signature _____ date

_____ print name

Michael A. Nissenbaum, MD, March 2009

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Population Sample - Demographics

- 20 homes in affected area
- Members of 9 homes interviewed
- ***None of 16 children interviewed***

Interviewed:

- 7 females, age range 41-73, mean 59 years
- 8 males, age range 47-75, mean 61 years

- Distance to nearest turbine ranges 1200 – 3400 ft
  Mean distance 2500 feet

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

Population Sample - Demographics

Sex	Age	Occupation	Distance to nearest turbine (ft)
F	confidential	confidential	3400
F	confidential	confidential	2400
F	confidential	confidential	2500
F	confidential	confidential	3000
F	confidential	confidential	3200
F	confidential	confidential	1200
F	confidential	confidential	2300
M	confidential	confidential	3400
M	confidential	confidential	2400
M	confidential	confidential	3000
M	confidential	confidential	3200
M	confidential	confidential	1200
M	confidential	confidential	2100
M	confidential	confidential	2400
M	confidential	confidential	2300

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

SLEEP DISTURBANCES **(new onset)**

Sleep Disturbance (total)	**14**	**93%**
Waking up middle of night:	13	87%
Difficulty falling asleep:	7	47%
1-2/WK	3	20%
3-4/WK	2	13%
5-7/WK	9	60%

Discussed with MD:	**13**	**87%**
Offered Rx:	12	80%
Accepted Rx:	5	33%
Offered & Declined Rx:	7	47%

Michael A. Nissenbaum, MD, March 2009

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Headache

Increased Headache:	**8**	**53%**
New onset headaches:	**6**	**40%**
Increased migraine frequency:	**2**	**13%**
New Rx	**2**	**13%**
Increased Migraine Rx	**1**	**6%**

Michael A. Nissenbaum, MD, March 2009

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Dizziness	**3**	**20%**
Tinnitus	**1**	**6%**
Unsteadiness	**1**	**6%**
Unusual Body sensations:	**3**	**20%**
Chest pulsations	**2**	
Pulsatile ear pressure	**1**	

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Hypertension

New Dx Hypertension	3	20%
Worsened BP	1	6%
New Rx offered or increased:	4	27%
New Rx accepted or increased:	3	20%
New Rx declined:	1	

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Troubled by Shadow Flicker

Troubled by Shadow Flicker:	**5**	**33%**
nausea & dizziness	*2*	
dizziness alone	*2*	
triggers migraine	*1*	

" like turning a light switch on and off, on and off '

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Weight Change

Weight changes since turbines online:	**6**	**40%**
Weight gain:	**5**	**33%**
Weight loss:	**1**	**6%**

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Psychiatric Symptomatology

Feelings of:

"Stress"	11	73%
"Anger"	13	87%
"Anxiety"	6	40%
"Irritability"	4	27%
"Hopelessness"	11	73%
"Depression"(total)	8	53%
new:	7	
increased:	1	

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Anger

" Absolute rage – you feel you want to kill someone, and don't know who to kill " *(67 y.o. woman)*

" So angry I could kill " *(65 y.o. man)*

" Makes my blood boil " *(65 y.o. woman)*

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Hopelessness

" Nobody will help us "

" No options – can't leave, and can't live here "

" This is an awful thing to have happen to you "

" People don't believe us – (our complaints) fall on deaf ears "

" No one cares. No one listens."

" They just tread on us "

" It's very hard watching my child suffer "

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Depression

7 new subjective symptom complexes **47%**
1 worsened prior Dx

4 New Rx offered
1 declined (incompatible with job license)
3 New Rx: Cymbalta, Lexapro, Mirtazepine **20%**

1 prior Dx, Rx increased/changed: Zoloft, Trazodone

Tearful at points during interview: 4 27%
2 women, 2 men

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

New Prescriptions

Total Number of New and Increased Prescriptions: 15

New Rx	12
Increased	3

Cymbalta
Mirtazepine
Trazodone
Hydrocodone
Benazepril
Anxiolytics (2)
BP meds (3)
Lexapro
Zoloft
Meloxicam
Tylenol III
Topamax

10 Rx offered and declined

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Has your quality of life been affected? 15 100%

"Loss of joy in living . . .put a lot of life's plans on hold"
"No desire to go outside"
"Feel trapped"
"Dreams have been dashed"
"Was our dream home . . . it's all been stolen from us"
"We have no peace and quiet"
"My husband's (who has advanced MS) only pleasure in life was to see the wild animals. They are gone."
"No sleep"
"Sinking feeling every night when I (come home) and see them."
"I used to be able to hear it snow, before. Now, I do not look forward to going home."

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Have you considered moving away?

Yes	**15**	**100%**

Why have you not moved away?

Can't afford to:	**11**	**73%**

Recent professional appraisal with loss of home value perceived as enough to make it impossible to move away: 8/9 homes 90%

Michael A. Nissenbaum, MD, March 2009

Mars Hill Wind Turbine Project Health Effects – Preliminary Findings
Symptoms Survey Results

Current survey weaknesses:

- Small sample
- Case Series structure
- Retrospective
- No study control
- No analysis for statistical significance as yet

- **Preliminary findings nonetheless alarming**
- **Do we have a right to subject the non coastal population of Maine to a 30 year prospective study?**

Michael A. Nissenbaum, MD, March 2009

Mars Hill ME DEP Nightime Noise Variance 45=>50 dbA

"There are 4 protected locations were the noise level would be above 45 dBA, but less than 50 dBA, **which is approximately equivalent to the noise that songbirds make . . .** the Department finds that the applicants' project will not have an unreasonable adverse impact . . . and therefore grants a variance from the noise standards for the windpower farm."

DONE AND DATED AT AUGUSTA, MAINE, THIS 1ST DAY OF JUNE, 2004.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: Dawn R Gallagher
DAWN R. GALLAGHER, COMMISSIONER

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application January 12, 2004
Date of application acceptance January 22, 2004

Date filed with Board of Environmental Protection
RC/L21635AN/BN

FILED
JUN - 2 2004
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

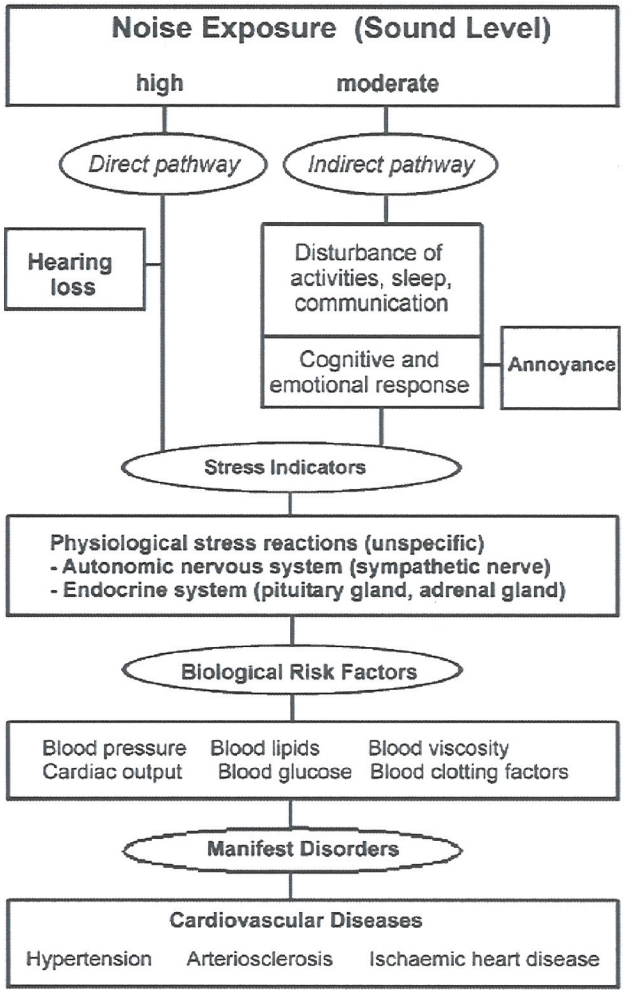
Michael A. Nissenbaum, MD, March 2009

Mars Hill ME DEP Nightime Noise Variance 45=>50 dbA

In fact, the turbines at Mars Hill produce night time readings 52.5 dBA, which Andrew Fisk of MDEP has characterized as 'substantially in compliance', and has issued a letter of compliance to First Wind/UPC.

He acknowledged, during a recent meeting in Fort Kent, that this reflected an average measurement which included downtime, though the statute is meant to regulate sound sources during operation.

Is this the Mars Hill Experience?



Preliminary findings are alarming

More detailed studies are required:

- Diurnal cortisol studies
- Larger population sample
- Detailed cardiovascular studies
- Detailed psychiatric assessments

*****16 Children*** MUST be studied.**

Health Aspects of Extra-Aural Noise Research, W. Babisch, German Federal Environmental Agency
Noise and Health 2004, 6;22, 69-81

Michael A. Nissenbaum, MD, March 2009

DO NO HARM

In light of these growing, serious medical concerns, we propose a moratorium on the building of any such "wind farms" until more research is done on the health impact that such facilities will have on the communities surrounding such technology. These communities and the Maine DEP and Health Services must be allowed time to study and learn from the European and Canadian experiences, as well as from the many affected families in Mars Hill, Maine, and put into place appropriate regulations and ordinances, prior to expanding the wind industry in the State of Maine.

Excerpt, Statement of the Medical Staff of NMMC, March 2009

Michael A. Nissenbaum, MD, March 2009

DO NO HARM

The State of Maine has a vast, unpopulated hinterland. There is little need to site industrial wind developments in proximity to residential communities if there is a risk of negative health effects. Quality of life, quality of place, and a healthful environment should be the right of all residents of Maine, including those of the rural north.

Excerpt, Statement of the Medical Staff of NMMC, March 2009

Michael A. Nissenbaum, MD, March 2009

Preliminary Findings are Alarming
In the Meantime, DO NO HARM

Options:

- Request moratorium until more extensive medical studies are done and current state of knowledge is fully understood by authorities and regulations reflecting risks and hazards put into place

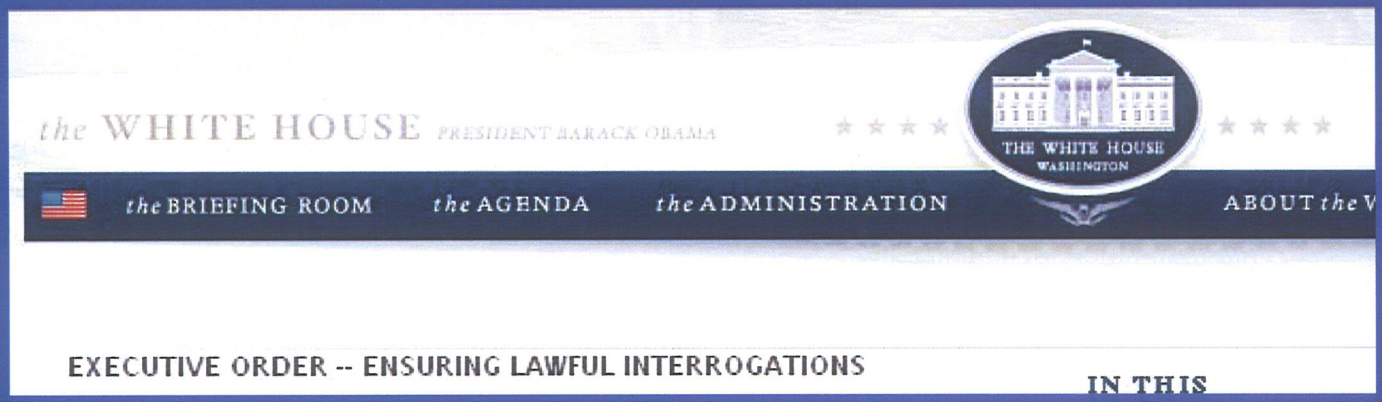
- Request siting setbacks reflecting current state of knowledge and non US jurisdictions' best practices (France, Germany, Australia) – including use of db(C) calibration

- Request a Wind Developer "Code of Conduct" be established and enforced by the State's Attorney General's Office (similar to NY State)

Michael A. Nissenbaum, MD, March 2009

Further Studies Must be Done NOW

How is any medical scientist going to conduct an epidemiological study of wind turbine health effects when 'Good Neighbor' and lease-holder gag clauses exist in land lease contracts?



Effective immediately, an individual in the custody or under the effective control of an officer, employee, or other agent of the United States Government, or detained within a facility owned, operated, or controlled by a department or agency of the United States, in any armed conflict, **shall not be subjected to any interrogation technique or approach, or any treatment related to interrogation, that is not authorized by and listed in Army Field Manual 2 22.3**

BARACK OBAMA
THE WHITE HOUSE,
January 22, 2009

Sleep Deprivation is not permitted in Army Field Manual 2 22.3

Michael A. Nissenbaum, MD, March 2009

WHO 2000 *Guidelines: Community Noise*

- When low frequency components are present, noise measures based on dBA measurements are inappropriate - dBC is a better measure when health effects are to be minimized

- It should be noted that a large proportion of low frequency components may increase considerably the adverse effects on health and the evidence on low frequency noise is sufficiently strong to warrant immediate concern

Berglund et al., 2000

EXHIBIT 3

BOULEVARD PLANNING GROUP

P.O. BOX 1272, BOULEVARD, CA 91905

Carl Stiehl, DPLU Project Manager March 11, 2010

5201 Ruffin Road, Ste B

San Diego, CA 92123-2960

via: Carl.Stiehl@sdcounty.ca.gov

RE: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006)

Dear Mr. Stiehl,

These comments are submitted on behalf of the Boulevard Planning Group, as a result of a unanimous vote taken at our regular meeting held on March 4, 2010. Our rural low-income community is one of the most impacted by the current all-out assault represented by major wind energy developers who are jockeying to gain a foothold and reap the unwarranted and unsustainable tax and rate payer funded subsidies, tax credits, tax breaks, accelerated depreciations, and upfront grants--at the expense of our community and those who visit this ruggedly beautiful area. Residents and visitors alike are drawn here for the currently appealing wide open spaces, scenic vistas, varied recreation resources, and the quiet ambiance which allows one to hear nature's varied voices without industrial scale noise, visual, and light intrusion / pollution

One company at work in our community is Iberdrola Renewables which recently announced a profit in excess of $1 billion. They have already collected over $500 million in 2009 tax payer funded ARRA grants and expect to rake in another $300 million or more in 2010 ARRA grants. They are in line to get an estimated $13 million grant for their 200 MW Tule Wind project in McCain Valley, our main recreation area. We see their heavy hand, and others, at work with significantly reduced setbacks / protections as proposed in this zoning ordinance amendment.

The County must resist the siren's call and false claims and promises of "Big Wind" including claims that there are no environmental impacts and that wind is a low cost alternative. The following statement, taken from the linked editorial, raises important issues / questions that should be asked and answered: http://www.windaction.org/faqs/26050

"Before you accept at face value that wind is a low-cost option for electricity, Windaction.org advises you to understand how electricity is priced in your region. When a wind project comes to town, ask the wind developer and your electric utility: What is the long-term price the utility is committed to purchasing the wind power? and, What is the wholesale price of electricity in your region? "

A full EIR should be undertaken for these zoning ordinance amendments due to the significant and cumulative impacts these reduced protections represent. The reduced protections will also set a bad precedent for any projects proposed on federal, tribal, and /or state lands that have the potential to impact our human and natural communities. Often times, private and conserved properties abut these proposed sites which are outside of County jurisdiction, as is the case with the Tule Wind proposal in McCain Valley. Overall, the impacts of these proposed amendments demand a full CEQA review .

The reduced setbacks will allow for increased density of turbine projects and increased profits for Iberdrola, Invenergy, Sempra, SDG&E, Hamann Companies, and others. For the impacted rural communities, the reduced setback requirements represent the following increased cumulative threats / negative impacts :

- Public health and safety
- Noise, infrasound and low sound vibration
- Fire threat from increased ignition sources
- Fire fighting interference
- Reduced property values
- Increased insurance rates
- Environment, biology, habitat degradation and fragmentation
- Visual pollution, landscape altering destruction
- Transformation from rural community character to industrial zone
- Economic impacts from educed ecological and recreation based tourism, and more.

Distributed Generation should outrank and take precedence over large scale rural projects: Using the carrot and stick approach, the County should adopt a policy, if one does not already exist, that ranks renewable energy projects in a manner that supports, gives preference to, and provides incentives to, distributed generation projects in the already built environment with existing infrastructure. Any industrial scale renewable energy projects proposed for undisturbed and/or sensitive lands in rural areas, with limited emergency services and infrastructure, and that require expensive, extensive, and destructive new transmission lines through fire prone areas, should be ranked dead last and strongly discouraged by the County.

Distributed generation alternatives to large scale rural projects: The California Renewable Energy Transmission Initiative (RETI) has determined there is up to 27,000 MW of potential small-scale distributed generation in the state. Other studies, including the San Diego Smart Energy 2020 Plan, by Bill Powers, state that San Diego County has an estimated 5,000 MW of potential photovoltaic capacity on existing structures and already disturbed lands. Developing distributed renewable energy generation facilities at and close to the point of use

would have fewer environmental impacts and be far less expensive than building large scale projects in rural areas that require new transmission lines and substations that are prone to disruption by wildfire.

The assigned PUC Administrative Law Judge's proposed decision on the Sunrise Powerlink project recommended denial of the project based on lack of need and the viable and less expensive, less environmentally destructive, and more reliable distributed generation alternatives. CPUC Commission John Bohn has also acknowledged that, *"...unlike other generation sources, (distributed generation) projects can get built quickly and without the need for expensive new transmission lines. And...these projects are extremely benign from environmental standpoint, with neither land use, or air emission impacts".* Moreover, distributed generation facilities pose significantly lower risk of shut-offs and damage from wildfires and thus would improve reliability. Here is a link to short video (3-1-10) of an on-site rooftop cylindrical solar panel project, that absorbs light from any angle, at a new Jersey Costco store that won an award for renewable excellence for Distributed and Onsite energy. It was installed by Solar Power Inc., a San Diego Company: http://link.brightcove.com/services/player/bcpid6801356001?bctid=69203632001

For the record, we herby incorporate by reference our Boulevard Planning Group scoping comments on the joint DEIR/EIS review for the Tule Wind, ECO Substation and Energia Sierra Juarez projects submitted to the PUC and BLM on February 15, 2010. A copy is attached for your convenience.

Also, please see our draft Boulevard Community Plan, under review as part of the General Plan Update, for more details on our support of and preference for low-impact residential scale wind and PV solar projects.

Section 5: 6123 Meteorological testing facility:

c: Notification should also include the impacted Community Planning Group. 300 feet is not a wide enough notification zone for adjacent properties. Any properties within site of the MET tower, that are placed on the market, will be required to fully disclose the MET tower permit and/or installation, and the fact that it represents the potential for a future industrial wind energy project, thereby impacting their property values. **Notification should also go to the same impacted property owners and Planning Group when existing permit extensions are applied for and under consideration**

d. Setbacks should be more than the height of the MET tower from non-participating properties and existing occupied buildings. Guy wires may create a whining, humming noise during certain wind events that could create a nuisance. MET towers also represent a potential wind energy project which must be disclosed during property sales, which could lead to lost sales or much reduced values.

e. There is no need to allow the installation of multiple MET towers within 500 feet of each other. A separation of several thousand feet, or several miles is more realistic.

f. All access roads need to be proven to have a deeded legal easement rights prior to any approvals or permits. Most rural roads are private and are not available for legal access without a deeded easement grant.

We strongly oppose the allowance of MET towers without an Administrative Permit as proposed with compliance of subsections b,d,e,f,gh,j and k of this section. Neighbors and planning groups need to be notified and allowed to provide input on any approval process.

Section 9: 6951 Wind Turbine System (small)

This section should also address vertical axis wind turbines, some of which are showing promise such as the Helix Wind design which survived the December 7, 2009 wind storm that damaged all 25 turbines at the Kumeyaay wind facility, and Mariah Power's Windspire. Both turbines are installed in the Boulevard, Jacumba area. The Windspire was very quiet when recently observed, and unobtrusive at only 30 feet tall.

a.1. Some smaller backyard turbines can be very noisy due to faster blade rotational speeds. They tend to be close to residences, and adjacent property lines, making their noise more constant. Small wind turbines are also subject to malfunction, blade throw, and other issues. The proposed setback of just the turbine height alone may not be adequate to protect adjacent, non-participating residences and sensitive receptors

a. 2. Fencing of small turbines seems excessive and adds an extra cost burden for non-commercial use.

a.3. Noise levels at the nearest non-participating residence should also be required--not just at the property line.

Large Wind Turbine System

b. 5 acre lots are too small for large turbines and would not allow for adequate setbacks for impacts to non-participating property owners , including noise, vibrations, shadow flicker, blade throw, tower collapse and fire. **Secondary fire access should be required with legal easements verified**. **Access roads should be required to be brought up to County road standards and paved. Enforceable road maintenance agreements and funding should be required prior to any project approvals.**

b. 1. i :Setbacks: We strongly oppose the significant reduction in setback requirements from public and private road easements and open space easements from the current 4 times the height of the turbine down to just the height of the turbine *tower* due to negative public health and safety impacts. The extra 150 feet or so of blade length needs to be added for the total height of the turbine. Average industrial wind turbines now stand an average of around 500 feet tall. Documented blade throw has been recorded at 1,650' to 2,200'. See Bethany Wind Turbine Study: http://townofbethany.com/other%20pdf%20files/Wind%20Turbine%20Committee%20Report.pdf. The current 4 times setback is closer the new recommendations of 1-2 miles to prevent the most significant public health and safety impacts that we strongly recommend and support

Following a catastrophic failure of two Vestas wind turbines on Feb 22 and 23, 2008, the Danish energy agency requested an investigation into the events. A report was produced by engineers at Risø DTU. A video of one of the failures can be seen here: http://www.windaction.org/videos/14294 . ***It is important to note that the debris from the first turbine failure which occurred on February 22 spread as far as 700 meters (2200 feet) away.*** Risø DTU is formerly a government research institution under the Danish Ministry of Science, Technology and Innovation.

Combined recommendations from the Danish report:

• It is recommended that the Consulting Committee for the Secretariat looks at these events soon, and provides guidelines to ensure that the certification of models and projects more precisely shows the required maintenance.

• It is further recommended that requirements for ongoing service and maintenance of wind turbines are very soon considered by the Consulting Committee for the Secretariat. Together with the industry, they should work to ensure that all wind turbines receive the necessary qualified service and maintenance.

Here is a link to the final investigative report: http://www.windaction.org/documents/21858

Here is a link to a short 2007 GE Energy document, "Extreme wind speed: risk and mitigation" http://www.windaction.org/documents/13914. It explains the risk in the event of extreme wind conditions including hurricane or tornado and any mitigation. ***Note, the document acknowledges the risk of blade throws and tower collapse.*** Also note that the area targeted for wind energy in East County is subject to extreme wind events, including hurricane and gale force winds and large twisting dust devils which can be hundreds of feet wide and extend several thousand feet high. Local barns and massive oak trees have been damaged by these twisting wind events. Hurricane Kathleen, in the late 70's took out I-8 and the railroad in the Mountain Springs /Ocotillo area. Boulevard was hit hard with torrential rains and high winds. We also point to the catastrophic failure at the Kumeyaay Wind facility during the December 7, 2009 high wind/ storm event. The facility was off-line for almost three months.

b.1.ii: Again, we strongly oppose the significant reduction in setback requirements from property lines, existing residences or buildings occupied by civic use types, from the current 8 times the wind turbine system height down to just 3 times the turbine system height, for the same reasons noted in our comment above at b.1.i. We also strongly oppose a minimum setback of 600 feet as grossly inadequate to protect public health and safety and sensitive receptors.

b.1.iii: We support additional setbacks, *beyond the new called for setbacks of 1-2 miles*, for noise and vibration compliance and for the protection of public health and safety. This section needs to take into account the potential for turbine malfunction including fire ignition, tower collapse and blade throw which can reach several thousand feet beyond the permitted turbine itself. Some of the turbine components weigh several tons. Residents beyond several miles complain of turbine noise impacts.

2. Fencing around individual turbines It is not necessary and we oppose it. It just adds to the cumulative significant visual impacts and further reduces / restricts movement of wildlife through the area.

3. Signs: Each turbine should have its own physical street address to aide in emergency response, especially in rugged rural areas far from any emergency response stations. Fires and accidents could occur at any time during construction, operation and maintenance.

4. Noise: The County Noise Abatement and Control Requirements should address the infrasonic low sound vibrations associated with the operation of industrial wind turbines. Preliminary ambient sound and vibration studies and ongoing monitoring should be required at adjacent sensitive receptor locations, including residential, recreation, open space, conserved lands, and critical wildlife habitats and corridors. These studies should be conducted by a third party that is not associated with the applicant. Again, we recommend a minimum 1-2 mile radius for these studies.

6. Visual , 7. Turbine Description, 8 Non-Operational Turbines, 9. Removal Surety: We support Section 6, 7, 8 & 9.

10. Existing Administrative Permits for Wind Turbines: Why is this here? Are there any existing administrative permits for wind turbine projects that were granted pursuant to Section 7060 prior to January 1, 1986. If so, wouldn't they be invalidated for lack of action and significant changes since the permit was issued?

6652 Solar Energy System:

b.1. Offsite PV Use: All adjacent property owners and the impacted community planning group should be noticed in a timely manner regarding any and all Administrative Permit applications for off-site solar projects including those less than 10 acres, especially in rural areas where the commercial and industrial zones may be limited and close to rural villages. New transmission infrastructure may also be needed in rural areas that could result in significant and cumulative impacts.

We support the MUP requirements for all other forms of solar energy production, especially those that require copious amounts of water and new infrastructure.

b.2& 3: We support the requirement for Major Use Permits for PV and other solar power projects on 10 acres or more, however, increased set-backs may be needed from non-participating properties, existing residences, conserved lands and other sensitive receptors. The reference to projects on more than 10 acres needs to be clarified as there appears to be confusion on the part of some property owners who reside on more than 10 acres and are considering a project for on-site use with the potential to sell excess energy back to the grid. Would the size of their property alone require a MUP? We do not believe that is the intent of the County.

NOTICE OF MITIGATED NEGATIVE DECLARATION (MND) FOR POD 09-006

We strongly object to this MND, based on the significant and cumulative impacts these changes represent, and formally request a full EIR for the Solar Wind Energy Zoning Ordinance Amendment (POD 09-006)

We object to the proposed MND due to the multiple significant and cumulative impacts that these reductions in setback requirements represent to our natural and visual resources, public health and safety, rural community character, property values, our tourism and recreation based economy and more. It is our strong position that a full Environmental Impact Report is needed to address the whole of the project and all of the impacts these significant changes and full compliance with CEQA. These changes also represent the potential for increased numbers of industrial turbines and increased density within those turbine facilities, thereby increasing the risk to resources, public health and safety, adjacent properties and our rural and natural communities in general. There will also be negative economic impacts through reduced property values and increased rates and /or cancellations for fire insurance.

CEQA Initial Study- environmental check list:

8. Description of project: We strongly object to the statement that the proposed ordinance amendments will "improve and enhance the public welfare and safety...". It is our strong position that the proposed amendments represent just the opposite. They are a huge step back from the previous requirements *(reducing setbacks from a previous 4-8 times the height of the turbine system down to 1-3 times)* and will result in significant and cumulative negative impacts to public health, welfare, and safety, and much more. The significantly reduced setbacks will result in an increased health and safety threat from malfunctioning turbines to adjacent non-participating properties, including residences, recreation areas, trails, conserved wild lands, and more. Industrial wind facilities require significant amounts of back up generation which is usually gas-fired power that has need to be kept available on standby.

9. Surrounding land uses: Historic Route 80 was left out of the list of main roads that serve the County. Views from Historic Route 80, along with a sense of history, will be most impacted due to the targeted wind resource

areas in East County. Historic Route 80 is promoted to tourists through the East County Visitors Bureau. It is a favorite route for car clubs, motorcycle, and bicycle groups.

Determination that a Negative Declaration will be prepared (page 4):

We strongly disagree with the Initial Study and determination to prepare a Negative Declaration. The proposed amendments will have major impacts that demand a full Environmental Impact Statement. Those impacts include but are not limited to the following significant and cumulative impacts:

- Environmental and visual resources
- Biological resources including endangered and sensitive species,
- Increased threat to public health, safety, and welfare
- Negative impacts to already stressed local tourism and recreation based economies
- Environmental Justice issues and undue burdens on rural low-income communities in targeted wind energy zones.
- Increased risk of fire and other damage from malfunctioning industrial wind turbines and related infrastructure. This risk includes increased rates and potential cancellation of fire insurance.
- Increased interference with fire fighting and aerial law enforcement operations
- Interference with radar weather forecasting and law enforcement communications resulting from turbulence generated by multiple wind energy projects within the same general area.
- Increased road damage and required maintenance from multiple projects requiring heavy truck traffic on poorly engineered rural roads
- Increased industrialization and fragmentation of areas that have already been scientifically identified as globally rare and significant Mediterranean mosaic with diverse and abundant wildlife with critical binantional wildlife corridors.
- Soil erosion and diversion of water to ground and surface water impacting both quality and quantity.

I. AESTHETICS (page 6):

a) We strongly object to the Less than Significant Impact noted. The correct selection would be Potentially Significant based on the significant and cumulative impacts that will occur. The significantly reduced setback requirements (from 4-8 times the turbine height to just 1-3 times the height), as proposed in these amendments, will allow for an increased number of wind turbine projects overall with higher turbine density within the various project footprints.

b) Again, we strongly object to the Less than Significant impact to scenic resources. The impact is Potentially Significant for the same reasons as those noted in I. a) above. We also want to note that the difficulty in mitigating for, or camouflaging, the visual impact from industrial wind turbines which now stand an average of 500 ' tall. For example, the existing Kumeyaay Wind turbines are 325' tall and stand starkly sky lined on a highly visible ridgeline which can be seen for miles and miles around. They can even be seen from the western portion

of Imperial Valley when the sun glints off rotating blades. Their blinking red night lights and flashing bright white strobe lights are also highly visible where only dark skies previously existed. **The proposed zoning ordinance amendments will serve to usher in the transformation of our scenic rural landscapes and vistas into 50-story tall whirling, blinking, strobe light flashing industrial zones with all the related infrastructure, damage, scarring and fragmentation--and the cumulative significant impacts that transformation represents.**

c) & d) Less than Significant should be changed to Potentially Significant Impact for degrading the existing visual character or quality of site and surrounding areas and creating new source of light or glare. See comments I a) and I b) above.

II AGRICULTURE RESOURCES (page 10-12):

a) Converting farmland impacts could be potentially significant based on cumulative and significant impacts from multiple wind and/or solar projects on or adjacent to farmland, including the related necessary infrastructure. For example, multiple proposed wind and solar projects are connected to the Sunrise Powerlink and ECO Substation projects. Along with the existing Southwest Powerlink, there will be three major power lines and easements impacting the prime farmland of the Jacumba Valley Ranch. Reduced setback requirements will result in the potential for more wind facilities with higher turbine densities.

c)conversion of farmland to industrial uses: This should be rated as a potentially significant impact instead of Less than Significant. Due to reduced setback requirements, these new industrial uses could result in significant and cumulative impacts from an increased number and density of turbine projects resulting in noise, vibrations, visual, environmental and disrupted access to both participating and non-participating farm and livestock operations. The farming/livestock operations could be abandoned in lieu of increased turbine operations and income, or due to negative impacts as has happened elsewhere, resulting in an increased number of absentee landlords who do not live in the impacted area. Industrial turbines can negatively impact livestock operations and well being.

III AIR QUALITY (PAGE 13-16)

a), b) & c): Please provide the evidence that industrial wind energy "will contribute to lowering polluting emissions from large power plants supplying power to the County of San Diego". It is a well known fact that wind energy is intermittent and requires an almost equal amount of backup generation which is usually natural gas fired power. Along with air quality impacts from the construction and grading activities and tons of cement mixing and decomposition, sources of PM_{10} will be increased with the increased number of industrial wind facilities, allowed by the proposed reduced setback requirements, and their miles and miles of new access roads (usually unpaved). There will also be significant and cumulative impacts from SP6 emissions from the related new transmission lines and substations required to support these industrial projects in rural neighborhoods.

d) Expose sensitive receptors to substantial pollution concentrations: These proposed changes could be potentially significant to certain rural neighborhoods in targeted wind energy zones, especially in and around Boulevard and the Tecate Divide. Along with the increased truck traffic during construction and constant replacement of giant wind turbine blades and other components, there will be impacts from increased SP6 and other EMF fields along the new transmission corridors and around the new electrical substations that will be required and connected actions to future industrial wind and /or solar projects. Wind turbines also require frequent oil /fluid changes with spills potentially impacting sensitive surface waters and sole source groundwater resources.

IV. BIOLOGICAL RESOURCES (PAGE 17-22)

a) - c): There will be significant and cumulative impacts from other industrial wind / solar / transmission projects outside of County jurisdiction on federal, state and tribal lands and/or a combination of those lands such as the Tule Wind project in McCain Valley. The Multiple Species Conservation Plan (MSCP) is mentioned in this MND document. However, East County is the most targeted area for wind energy development and the East County MSCP is still incomplete. There are also concerns that proposed precedent setting changes to the MSCP to allow for mitigation lands to be purchased outside the impacted area will further exacerbate the damage from large scale industrial projects in our area of globally rare and significant Mediterranean Mosaic habitat, with mitigation occurring outside our impacted area.

d) & e) There are Potentially Significant Impacts to wildlife corridors, habitat and lands proposed for conservation: Again, we point you to the linked Las Californias Binantional Conservation Initiative and ask that you compare the critical wildlife corridors with the wind energy maps to see the conflict and threat to our abundant and diverse species and intact habitat that will be fragmented by multiple industrial wind energy and transmission projects and proposed corridors to support even more projects: http://consbio.org/what-we-do/las-californias-binational-conservation-initiative

V. CULTURAL RESOURCES (PAGE 23-28)

The most targeted wind energy areas are in East County which was the last stronghold for local tribes. The area is rich in cultural landscapes and resources. The views to and from them are unique to the region and retain significance to living tribal members. Many of these impacts to landscapes, sacred places and traditional cultural properties, in our view, will be incredibly difficult to mitigate.

Those experienced in cultural resource investigation and protection have informed us that many sites identified as individual sites are often part of larger more expanded sites or complexes which is often not recognized until after the fact and the damage is done. This is the case in impacted McCain Valley and much of East County.

The significant and cumulative impacts to these cultural resources should be ranked as Potentially Significant instead of the current Less than Significant.

VI. GEOLOGY AND SOILS (PAGE 29-35)

This section should be ranked as Potentially Significant Impact due to the significant and cumulative impacts that could result from collapsed industrial wind turbines and numerous power lines due to seismic impacts and liquefaction. Without proper setbacks, these structural failures could result in downed powerlines and blocked evacuation routes trapping residents and visitors from fleeing any fires that followed a quake and /or preventing access for emergency services. The San Diego Union Tribune's front page article (2-7-10) reports that industrial wind turbines have never been studied for seismic stabilities. We find this alarming, especially since Tule Wind is proposed for the McCain Valley National Cooperative Land and Wildlife Management Area that is one of the most visited recreational areas in the BLM's Eastern San Diego planning area. Turbines are proposed inside the Lark Canyon OHV Park and campground and near Cottonwood Campground--family oriented use areas. The wind turbine that was subjected to the recent test is only 80 feet tall. At Tule Wind, and other future wind energy projects in our area, the turbines will be close to 500 feet tall which represents a potential for increased structural failure and the crashing down of

multi-ton nacelles, 150 ' long blades, and hundreds of gallons of oil per turbine. See:http://www.signonsandiego.com/news/2010/feb/07/wind-turbine-getting-seismic-shakedown/

In February 1892 a 7.8 (or 7.3 depending on which report you read) earthquake occurred with reported ground fissures in McCain Valley and Jewell Valley and rockslides in Mountain Springs, Carrizo and Jewel Valley areas. These areas are targeted for wind energy projects. Here is Link to USGS page: http://earthquake.usgs.gov/earthquakes/states/events/1892_02_24.php . A more detailed report of ground cracking open in McCain Valley, earth appearing sifted several feet deep in Jewel Valley, and rock slides in Mountain Springs and Jewel Valley, is included at page 103 of Memories of the Early Settlements by Ella McCain (1955). Ella reported that:

" My husband and I were living in McCain Valley at the time, he was plowing to plant grain. In the field where he was plowing, the ground cracked open and the crack remained there for several years. At Jewel Valley, then Church Dome, the ground opened and closed again near where my nephew, Johnny Williams was playing. He ran to the house, told his father and uncle, they dug down to see and the earth looked like it had been sifted for several feet down. Rocks rolled from hillsides. I was visiting in Potrero at the time and I have never felt another quake as severe as that one, in Potereo. It kept shaking four or five days, it was said that there were one hundred sixty two shocks in the next two days..."

The California Geological survey shows locations of where the 1892 earthquake was reportedly felt, including McCain Valley. This earthquake has reportedly been associated with a 20 foot displacement on the Laguna Salada fault in western Imperial County near where the Imperial Valley Substation is located, near the proposed SES Stirling Solar Two project site at Plaster City, and near the Sunrise Powerlink route. Go to this link to use the interaction feature for the map: http://redirect.conservation.ca.gov/cgs/rghm/quakes/historical/events/18920224_0720/18920224_0720.html

VII HAZARDS AND HAZARDOUS MATERIALS (PAGE 35-41)

Our research shows that industrial wind turbines use various lubricants / fluids that could be hazardous, especially in the event of a spill or leak as one documented below. The linked document "Castrol: Focus on Wind Turbines", shows diagrams where the various turbine components require lubricants/fluids:

http://www.castrol.com/liveassets/bp_internet/castrol/castrol_advantage/STAGING/local_assets/downloads/w/wind_turbines_brochure_EN.pdf

It is our understanding that several hundred gallons per turbine may need replacement on an average of every 3-6 months. The linked Castrol document claims the use of their specialized lubricants can reduce the need for such frequent maintenance. Regardless, the County needs to address the reality that industrial scale wind energy does involve potentially hazardous substances and wastes, some of which can be hazardous during transport, storage, operation and maintenances, spills and fire events. The County needs to admit and plan for this reality.

This linked document states that each turbine will each have approximately 214 gallons of lubricants and hydraulic fluid in its nacelle or hub at any given time, for a total of 27,820 gallons among all 130 turbines, in

addition to 40,000 gallons of electrical servicing oil stored onsite: http://www.masstech.org/offshore/CapeWindFAQs/airwater.html

The Potentially Significant Impacts from multiple renewable energy projects, on local, state, federal and tribal lands, in the groundwater dependent areas of the County include potential leaks of hazardous fluids used in wind turbines and other hazardous materials used in various solar thermal projects. **Here is an article regarding impacts to a domestic water well from a 491 gallon oil spill from an explosion at a wind turbine farm:** http://www.windaction.org/news/13367?theme=print

Not all projects will fall under County authority or control. Industrial wind turbine facilities, especially those that are adjacent to important roadways and/or transmission lines should be added to the Operational Area Emergency Plan and Multi-jurisdictional Hazard Mitigation Plan.

g) Exposure of people or structures to significant risk of loss injury or death involving wildland fires (page 42):

This section should be marked as Potentially Significant Impact instead of Less than Significant. As noted in our previous comments above, the cumulative and significant threat to our High Fire Danger Zone area from multiple industrial wind turbine projects, with their thousands of gallons of hazardous fluids, related transmission lines, substations, transformers, underground vaults, etc, the potential for catastrophic failures, debris fields, explosions and fires, which could also block roads, is drastically increased. Some of the cumulative projects and impacts may occur in areas outside of County jurisdiction and control.

VIII HYDROLOGY AND WATER QUALITY (page 45-56):

See our comments at VII above.

The following information was taken directly from the American Wind Energy Association's website:

"Small amounts of water are used to clean wind turbine rotor blades in arid climates (where rainfall does not keep the blades clean). The purpose of blade cleaning is to eliminate dust and insect buildup, which otherwise deforms the shape of the airfoil and degrades performance.

Similarly, small amounts of water are used to clean photovoltaic panels.

Water use numbers for these two technologies are as follows:

WATER CONSUMPTION--WIND AND SOLAR

Technology	*gallons/kWh*	*liters/kWh*
Wind [1]	*0.001*	*0.004*
PV [2]	*0.030*	*0.110*

[1] American Wind Energy Association estimate, based on data obtained in personal communication with Brian Roach, Fluidyne Corp., December 13, 1996. Assumes 250-kW turbine operating at .25 capacity factor, with blades washed four times annually.

[2] Meridian Corp., "Energy System Emissions and Materials Requirements," U.S. Department of Energy, Washington, DC. 1989, p. 23.

The AWEA information quoted above is at : http://www.awea.org/faq/water.html

Using the posted AWEA information, theoretically, a 1.5 MW turbine operating at 100% capacity factor for a full year will require 13,140 gallons of water per year (1.5mw x 1000kw/mw x 8760 hr x .001 gal). A 100-turbine farm could use 1,314,000 gallons per year. Even if cut to 30-50% energy production rate, over 1/2 million gallons of water per year per turbine farm is a lot of water in an arid groundwater dependent area. Where will the water come from? Who will monitor any groundwater wells? Another question to ask if whether or not any type of detergent or cleaner is used when washing the turbine blades, that could also negatively impact surface and groundwater over time with accumulation and percolation. Cumulative impacts from both water use and potential contamination are potentially significant and must be addressed.

a) Some cumulative projects will be located outside County control and authority. Boulevard watershed is also split by the Tecate Divide with half in the San Diego Regional Water Quality Control Board area and half in the Colorado River Basin Regional Water Quality Control Board.

f) Cumulative projects in the same area could result in Potentially Significant Impacts through blasting, grading for turbine pads and access roads, storm water runoff, oil spills, and more. Not all projects will be subject to County control and authority.

h) Hundreds of hydraulic fluid leaking industrial wind turbines can lead to localized areas of contamination. Nearby springs, seeps and storm runoff could become contaminated and impact downstream wells and wildlife water sources. Go to this link to see photos of leaking turbines at the Kumeyaay Wind facility: http://www.eastcountymagazine.org/node/2734

IX LAND USE PLANNING (PAGE 57)

b) Conflicts with multiple projects on state, federal, and/or tribal lands could result in significant land use planning conflicts and cumulative impacts.

XI NOISE (PAGE 59-66)

It is important to recognize that night-time ambient noise levels in rural areas are often 30dB or lower; so, wind farms may become the new and dominant acoustic presence. Wind developers often tell local planning boards and decision makers that the turbines will be inaudible, which is rarely the case. Sometimes they will take the decision makers to the base of existing turbines to show how quiet it is, when the real noise is projected out and away from the turbines towards adjacent properties.

If temperature inversions or other atmospheric stability effects that cause excessive noise occur just 10% of the nights, that means that nearby residents may still find their sleep disturbed 35 nights a year. Denial of these issues by wind energy proponents does not mean the problem does not exist. In Boulevard, off-reservation residents within several miles of the existing Kumeyaay Wind project complain of frequent noise and vibration impacts. The catastrophic failure that shut down the wind farm operations from December 7, 2009 to early March 2010 was their only respite, giving the impacted residents some of their first peaceful night's sleep since the 2005 installation of the turbines.

Here is an excerpt from a January 2010 KPBS story on wind energy in East County: Jerry Yops is a property owner/resident on Ribbonwood Road in Boulevard. His property, and others will lay between the existing 50 MW Kumeyaay wind and the proposed 200 MW Tule Wind project. YOPS: "***There is a noise problem and also there's a – what's called wind turbine syndrome. It's been studied extensively and there's a doctor in New York, Nina Pierpont, that has studied this and it actually exists as wind turbine syndrome. You can hear a noise from – I'm two to three miles away. You can hear noise 24 hours a day. It sounds like a large truck on the freeway that never goes away; it's just constant."*** See the entire story at: http://www.kpbs.org/news/2010/jan/27/community-opposition-proposed-energy-projects/

a) Exposure to ongoing noise and infrasonic/low sound vibrations from the operation of one or more industrial wind turbine facilities, is a Potentially Significant Impact that needs to be addressed not ignored. It is our strong concern that the proposed significant reduction in setback requirements, the County Noise Ordinance, and other applicable standards, are all flawed and do not adequately address the very real emerging public health and safety impacts resulting from the operation of industrial wind turbines as documented by a growing body of evidence from around the nation and the world. San Diego County is obligated to provide real and enforceable protection for its citizens and resources from these new sources of industrial noise and infrasonic vibration pollution and the resultant health and environmental impacts.

At page 60 the Ramona Community Plan is referenced. What about the Boulevard Community Plan that specifically addresses wind turbine related noise and other impacts and the necessary setbacks to protect the human and natural communities?

At page 61, we strongly reject the statement that, "It is not believed that noise generated from large wind turbine facility result in impacts to human health". This wind industry promoted position has been thoroughly contradicted by an ever increasing number of reports, videos and other evidence to the contrary. The MND goes on to refer to reports from the British Wind Energy Association and joint AWEA/CanWEA reports that reportedly show no correlation exists between the noise generated from wind turbines and humans living in the vicinity of large turbines. Wind energy associations are the lobbying and PR arm of the "Big Wind" energy companies and those whose living and investments rely on the proliferation and forced intrusion of industrial wind energy turbines into our communities, residential neighborhoods, and wildlands. Therefore, their biased reports should be read with the understanding that those who paid for and had control over the content of the report, represent those who profit off of big wind--often to the tune of billions of dollars per year, most of which comes at the expense of US tax and rate payers. They place profit over community protection.

On March 27, 2009, residents of Mars Hill living within 3600 feet of First Wind's wind energy facility filed a civil complaint in Maine Superior Court seeking relief from the "significant harm" caused by the First Wind and others by the construction and operation of the site--including turbine noise, lights and shadow flicker. The full complaint can be accessed by clicking on this link: http://www.windaction.org/documents/22650

An analysis which discredits the American Canadian Wind Energy Association's Wind Turbine Sound and Health Effects can be found at http://www.windvigilance.com/awea_media.aspx . It states that:

"Conclusions of the A/CanWEA Panel Review are not supported by its own contents nor does it have convergent validity with relevant literature. *The A/CanWEA Panel Review acknowledges that wind turbine noise may cause annoyance, stress and sleep disturbance and that as a result people may experience adverse physiological and psychological symptoms. It then ignores the serious consequences.*

World Health Organization identifies annoyance and sleep disturbance as adverse health effects.

In 2009 the World Health Organization released a peer reviewed summary of research regarding the risks to human health from noise induced sleep disturbance. Some of the adverse health effects documented include fatigue, memory difficulties, concentration problems, mood disorders, cardiovascular, respiratory, renal, gastrointestinal, musculoskeletal disorders, impaired immune system function and a reported increased risk of mortality to name a few.

Health Canada acknowledges the health consequences of stress and considers it a to be a risk factor in a great many diseases, such as heart disease, some types of bowel disease, herpes, mental illness and difficulty for diabetics to control blood sugar. It states severe stress can cause biochemical changes in the body, affecting the immune system, which leaves the body vulnerable to disease.

Despite the acknowledgement that wind turbine noise may cause annoyance, stress and sleep disturbance the A/CanWEA Panel Review fails to offer any science based guidelines that would mitigate these health risks.

On the contrary the A/CanWEA Panel Review concludes by suggesting that the authoritative health based noise guidelines of the World Health Organization should be ignored and that wind turbine noise limits be based on public policy. "

The French National Academy of Medicine has called for a halt of all large-scale wind development *within 1.5 kilometers (roughly 1 mile) of any residence, and the U.K. Noise Association recommends a 1km* separation distance. Dr Nina Pierpont has done studies on wind turbine noise impacts which she named Wind Turbine Syndrome. Of the ten families included in her case series, all living between a half mile and mile from turbines, eight have (so far) moved out of their homes; Pierpont now recommends setbacks of 2km (1.25 miles) in flat terrain, and 3.2km (2 miles) in hilly terrain. Pierpont's peer-reviewed Wind Turbine Syndrome book was recently released. More information is available at www.windturbinesyndrome.com.

Here is a link to a video with turbine noise. Please read the notes under the video box, including the one from Rick James noting the video audio is missing much of the low frequency content from about 250 Hz down. It is the lower frequency sounds of the turbines that penetrate homes and vibrate buildings. http://www.windaction.org/videos/15829

A reference to the NREL Overview of Existing Wind Energy Ordinances is made at page 61 and elsewhere in this MND. This linked Washington Times piece, reportedly based on documents obtained through the Freedom of Information Act, indicates that the NREL is not an unbiased apolitical entity especially where industrial wind energy is involved: http://washingtontimes.com/news/2010/mar/09/covering-up-the-wind-energy-failure//print/.

The Department of Energy's Lawrence Berkeley National Laboratory report titled "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi- Site Hedonic Analysis" released December 2009 generated media headlines claiming "Wind farms have no effect on property value." The DOE report which cost taxpayers $500,000, has since been discredited by numerous professionals. In his paper, "Wind Farms, Residential Property Values, And Rubber Rulers" Albert R. Wilson, a valuer of environmental impacts on business and real estate, with 25 years experience including 10 years of teaching and writing on the subject, writes that the underlying methods used in the development of the DOE study raise serious questions concerning the credibility of the results. In particular, the authors failed to follow any of the well-developed and tested standards for performing regression analyses on property sales. Wilson's view is shared by others. See the Wilson report here:
http://www.arwilson.com/pdf/newpdfs/WindFarmsResidentialPropertyValuesandRubberRulers.pdf
http://www.windaction.org/releases/25672

Pl ease refer to more extensive comments and linked documents on pages 11-13 in our attached Tule Wind, ECO substation and Energia Sierra Juarez scoping comments on Wind Turbine Syndrome, and other turbine noise related reports. At a minimum the County should take their lead from the 2008 "how to" guide for criteria for siting to prevent health risks from sound by George Kamperman and Rick James which is referenced by the County. The professional report can be found at http://windaction.org/documents/17229. It recommends 1.5 km setback. Dr. Nina Pierpont's Wind Turbine Syndrome peer reviewed research now recommends a 2 km setback in hilly terrain. Kamperman/James recommend testing prior to approval to establish ambient noise / vibration levels in order to create enforceable contracts and mitigation requirements.

Here is a link to a British article (Sunday Times 12-13-09) regarding a cover up of wind turbine noise issues in a government report :
http://www.timesonline.co.uk/tol/news/environment/article6954565.ece.

In his Sleep disturbance and wind turbine noise, Dr. Christopher Hanning (May 2009) stated that: *"In my expert opinion, from my knowledge of sleep physiology and a review of the available research, I have no doubt that wind turbine noise emissions cause sleep disturbance and ill health".* Find the full report at: http://www.windaction.org/documents/22602

Perspectives on wind turbine noise by *by Dr. G. P. van den Berg* appeared in the Summer 2009 issue of Echoes, the newsletter of the Acoustical Society of America. See the short report at:
http://www.windaction.org/documents/22351

See the Acoustic Ecology Institute's Special Report : Wind Energy Noise Impacts at :
http://www.acousticecology.org/srwind.html

b) Exposure of persons to or generation of excessive groundbourne vibrations or groundborne noise levels. See noise comments above. We strongly disagree that a setback of 600 -1,000 feet will ensure no impacts. The cited 1995 Transit Noise and Vibration Impact Assessment is outdated and not really applicable to the known and emerging impacts from industrial wind turbines.

In regards to noise / vibration impacts on wildlife see the study noted below at : http://aeinews.org/archives/573. Endangered and sensitive species will be impacted by the proliferation of wind energy projects in and near sensitive lands, conserved lands, critical habitat, critical wildlife corridors and more:

NPS study: moderate noise can have major impacts on animals

December 12, 2009 in The Acoustic Ecology Institute

An ongoing research project from the National Park Service Natural Sounds Program is about to publish a groundbreaking paper that outlines the many ways that even moderate increases in human background noise can create major impacts on animals. The study proposes a new metric for use in bioacoustics research, the "effective listening area." This is the area over which animals can communicate with each other, or hear other animals' calls or movements; as might be expected, animals focus especially on listening for sounds at the very edges of audibility, so that even a small increase in background noise (from a road, wind farm, or regular passing of airplanes) can drown out sounds that need to be heard. The authors note analyses of transportation noise impacts often assert that a 3dB increase in noise - a barely perceptual change - has "negligible" effects, whereas in fact this increased noise reduces the listening area of animals by 30%. A 10dB increase in background noise (likely within a few hundred meters of a road or wind farm, or as a private plane passes nearby) reduces listening area by 90%.

Noise pollution exacerbates the problems posed by habitat fragmentation and wildlife responses to human presence; therefore, highly fragmented or heavily visited locations are priority candidates for noise management. Noise management might also offer a relatively rapid tool to improve the resilience of protected lands to some of the stresses imposed by climate change."

The findings include the following:

- Masking affects not only audibility, but understanding: “thresholds for discrimination between calls of the same species were consistently higher than were detection thresholds for the same calls.” Not surprising, but easy to forget: background sound often obscures the words being said, though we can still hear the voice.
- Bats that listen for ground movements of their prey hunt more in quiet areas than noisy ones; similarly insect-eating birds are more likely to avoid noisy areas than other birds.
- Masking can also make it more difficult for animals to tell what direction a call (such as a mating call) is coming from
- Pronghorn antelope showed a marked shift in proportion of time spent foraging and in vigilance (looking around) when closer to roads: foraging dropped from 45% of the time to 35%, while vigilance increased from 40% to over 50%.
- Two key studies of increased vigilance in clearly noise-triggered contexts: Ground squirrels showed a marked increase in vigilance behavior when hearing squirrel alarm calls at a site in a wind farm than in a quiet site (including a slightly less “relaxed” non-vigilance baseline state), and a lab study with chaffinches found that the mean time spent pecking (eating) between times scanning the area decreased when noise was introduced.

The authors conclude by stressing: ***"Chronic noise exposure is widespread. Taken individually, many of the papers cited here offer suggestive but inconclusive evidence that masking is substantially altering many ecosystems. Taken collectively, the preponderance of evidence argues for immediate action to manage noise in protected natural areas….The costs of noise must be understood in relation to other anthropogenic forces, to ensure effective mitigation and efficient realization of environmental goals. Noise pollution exacerbates the problems posed by habitat fragmentation and wildlife responses to human presence; therefore, highly fragmented or heavily visited locations are priority candidates for noise management. Noise management might also offer a relatively rapid tool to improve the resilience of protected lands to some of the stresses imposed by climate change."***

Here is a link to an article regarding the loss of a goat herd on impacts from industrial wind turbines: http://news.bbc.co.uk/2/hi/asia-pacific/8060969.stm

Here is link to another article regarding a family that had to move from their farm due to impacts from an industrial wind farm on their health and the health of their alpaca herd.: http://betterplan.squarespace.com/todays-special/2009/5/20/52009-its-all-in-your-head-are-you-a-congenitally-unhappy-pe.html

c)We strongly disagree that the impact from a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project are less than significant. There will be significant and cumulative impacts from multiple wind energy project. The proposed zoning ordinance amendments will allow for more wind energy projects overall with increased density--due to significantly reduced setback requirements. They also set a precedent for projects on lands outside County authority. Setback requirements with a minimum of 1-2 miles are needed to protect the human and natural communities from these unnatural industrial scale noise and vibrations impacts.

d) We strongly disagree that the substantial temporary or periodic increase in ambient noise levels in the project vicinity will be less than significant. See comments above on noise and vibration impacts. We are also concerned with the proper establishment / documentation of pre-project ambient noise and vibrations levels and enforceable permit requirements to ensure protection of people and animals.

XIII. PUBLIC SERVICES (page 69):

It is our strong opinion that the cumulative impacts from the proliferation of more large scale wind turbine facilities , more dense projects, allowed by these proposed zoning ordinance amendments with reduced setbacks, will be significant. The introduction of new wind turbine projects and the necessary new transmission lines and substations, including those on surrounding lands not under County jurisdiction, will require the building, equipping, and staffing of numerous new fire / emergency response facilities to address significant new fire, public health and safety, threats these projects represent.

XIV. RECREATION (page 70):

It is our strong opinion that there will be significant and cumulative adverse impacts to recreation resources in the East County area based on the increased number of wind energy projects, with increased density, that will be allowed with the proposed amendments--including projects on lands outside County jurisdiction. Reduced / lost recreation opportunities in the impacted areas may require mitigation within the same planning area.

XV. TRANSPORTATION / TRAFFIC (page 70):

a & b) The construction and ongoing maintenance of multiple industrial wind energy projects in the same area could impact rural roads and intersections, especially if they were not designed, engineered, or constructed to meet the needs of heavy truck traffic carrying huge heavy weight components. Most of our rural roads do not meet current standards. Components delivered to the installation sites by truck would be of significant weight. Nacelles, typically transported in two sections, can have a total weight of 80 tons. Assembled cranes, typically transported in as many as 15 trucks, can weigh as much as 450 tons. Some of these projects may be located on lands outside of County jurisdiction while impacting County roads, traffic, and maintenance requirements. The Tule wind project proposes to bulldoze a new road across the Tule Creek 100 year flood plain--because their large equipment will not fit under the I-8 overpass on McCain Valley Road. During wet years Tule Creek is flowing stream that feeds into protected lands and habitats.

c) Cumulative and significant impacts to flight paths and aerial operations for military, law enforcement (including Border Patrol), air ambulance, etc, may result from the proliferation of wind turbine projects and the more dense projects allowed by the reduced setback requirements in these proposed amendments. The turbulence from wind turbine facilities can also impact Doppler radar showing as false storm activity which may also result in changed flight paths and operations.

d) See comments "a" & "b" above.

e) Cumulative impacts with reduced emergency services access could occur on dead end rural roads, including recreation areas in McCain Valley, if blocked by collapsed towers, debris fields from malfunctioning turbines, fires and explosions generated by single or multiple projects, including those on lands outside County jurisdiction. Tule Wind project proposes to use Ribbonwood Road for construction and maintenance access for their McCain Valley road project, the same road proposed for ingress/egress for the new Boulevard Border Patrol station just north of I-8. Turbines and transmission lines will also impede fire and rescue services in and around project areas.

XVI. UTILITIES AND SERVICE SYSTEMS:

d) In the groundwater dependent rural areas of East County, where most of the wind energy projects are focused, there could be significant and cumulative impacts from the construction and maintenance of multiple wind energy projects, and the related new transmission and substation projects and access roads. The proposed zoning ordinance amendments can increase the number and density of these projects thereby creating cumulative impacts--some of which may be outside County jurisdiction. The Sunrise Powerlink project, and their ongoing quest for legally acceptable water sources , is an example of the difficulties of finding adequate water resources in the backcountry. The PUC and BLM approved that project prior to a water source being determined and secured.

f & g) We strongly disagree that the generation of solid waste is not anticipated with wind and solar projects. Cumulative impacts from construction and demolition debris (which the County requires to be recycled) and the fairly frequent need to dispose of damaged wind turbine blades, which reportedly cannot be recycled due to their composite nature, from multiple industrial wind energy projects in rural areas that no longer have any bin/ transfer sites or other form of publicly available disposal, is significant and must be addressed. There are also waste oil storage and transportation requirements for turbine projects. Cumulative impacts include multiple projects that may be outside County jurisdiction. We point to the existing Kumeyaay Wind facility which had to remove all 75 turbine blades from all 25 turbines after they suffered catastrophic failure during the December 7, 2009 storm event. Damaged blades are currently littering the ground at the base of the turbines, along with the discarded rotor nose cones. The lack of a close disposal / recycling facility will increase the need

for truck transport of waste with increased GHG impacts. Sycamore Landfill in Santee, approximately 60 miles to the west, is the closest licensed facility. A proliferation of wind projects could result in need to dispose of a significant number of blades, approximately 150 feet in length and weighing several tons each.

XVII.MANDATORY FINDINGS OF SIGNIFICANCE:

a, b & c) We challenge the County's findings that no significant, cumulative, or substantial environmental effects will occur due to the proposed zoning ordinance amendments and significantly reduced setback requirements. We believe our detailed comments and references prove that there will be significant, cumulative and substantial environmental effects / impacts including adverse effects on both the human and natural communities. These effects will also adversely impact our rural property values. See our attached joint scoping comments to the PUC/BLM on Tule Wind, ECO Substation and Energia Sierra Juarez projects (dated 2-15-10) for more information on all the issues noted in these comments and more.

Multiple wind energy, and their related transmission and other infrastructure projects and easements will generate significant and cumulative impacts to the proposed East County MSCP and **the Las Californias Binational Conservation Initiative (LCBCI). The LCBCI has already scientifically identified much Southeastern San Diego County, targeted for industrial wind energy projects and transmission infrastructure, as globally significant and rare Mediterranean mosaic with diverse and abundant wildlife, including endangered and sensitive species, critical habitat and wildlife corridors.**

The attached LCBCI report includes the following summary*: "The border region of California and Baja California—Las Californias—lies at the center of one of the world's biodiversity hotspots, harboring ecosystems and species that occur nowhere else on earth. It is also a growing, multi-national metropolitan area of more than 5 million people. The integrity and functionality of ecosystems in the border region, as well as the health, economy, and standard of living of its residents, depend on a system of open space reserves that are interconnected across the international border. The urgency of this need cannot be overstated, as the ever-growing human footprint of development is beginning to preclude opportunities for protecting a functional open space system."*

Over 1,000 acres was already purchased in Jacumba, for inclusion into the Anza Borrego Desert State Park, as part of the LCBCI process. It is our understanding that other purchases have been made in the Hauser Canyon area that has also been the target of industrial wind energy proponents.

CONCLUSION:

We strongly urge the County to withdraw/deny the proposed Mitigated Negative Declaration for the Solar Wind Energy Zoning Ordinance Amendment and to move forward with the legally required Environmental Impact Report mandated by CEQA to address the significant and cumulative impacts generated by the proposed amendments, including impacts from projects on lands outside County jurisdiction.

The County is flat out wrong to state that these proposed zoning ordinance amendments will *"improve and enhance public welfare and safety"* and that *"It is not believed that noise generated from large turbine facilities results in impacts to human health".* They are a huge step backwards from the previous requirements *(reducing setbacks from a previous 4-8 times the height of the turbine system down to 1-3 times)* and will result in significant and cumulative negative impacts to public health, welfare, safety, and much more.

The significantly reduced setbacks will result in an increased health and safety threat from noise, infrasonic vibrations, and malfunctioning turbines to adjacent non-participating properties, including residences, recreation areas, trails, conserved wild lands, and more. Industrial wind facilities require significant amounts of back up generation, often equal to the capacity of the wind farm itself, which is usually gas-fired power that has need to be kept available on standby.

We have provided enough information to support our request for significant increased setback requirements related to industrial wind turbines, more in line with the requirements in the current zoning ordinance. New and emerging information fully justifies setbacks of at least 1-2 miles for industrial wind turbines, which now stand an average of 500 feet tall, to protect public health and safety, the environment, and rural property values.

It is unconscionable and perhaps unlawful for the County to deny the evidence we have presented of the real harm / damage that can result from the installation and operation of industrial scale wind energy facilities. Especially in rural areas, where the ambient noise and vibration levels are generally low with even lower night time noise levels. Property owners have actually been bought out by wind energy project owners based on impacts to their health and well being. Unfortunately, those buyout agreements usually include a gag order to protect the project owner/ investors.

The County and its various agencies have both a legal and a moral duty and obligation to protect its citizens and its scientifically identified globally significant and rare resources and wildlife linkages in East County, as documented in the Las Californias Binational Conservation Initiative. We strongly encourage the County to comply with that legal and moral obligation instead of caving in to the overblown and unsupported claims made by the industrial scale wind industry representatives who, from all appearances, place their profits far above public health and safety and the overall well being of our rural human and natural communities. Their financial gain comes at the expense of our rural communities, our quality of life and more, and at the increased expense of tax and rate payers (us again). Unlike the corporate industrial wind entities, with headquarters out of state and overseas, we live here and will face significant and cumulative impacts on a daily basis--unless we are eventually forced from our homes as others have been forced from theirs after various agencies allowed industrial wind turbines to be built too close. The few local jobs that may be created and any financial benefits the County might receive are not worth the transformation of rural east county into an industrial zone for an industry that may be obsolete in just a few years and no longer supported by massive government subsidies.

There are many opportunities for San Diego County to protect valuable and critical rural resources while generating renewable energy at and near the point of use, including the emerging fuel cells with combined heat and power like the Bloom Box and Clean Edge, that negate the falsely professed need for industrial scale wind energy projects, and large scale solar projects in environmentally sensitive areas of East County that require new extensive, expensive and destructive, transmission infrastructure and back up generation.

Please do the right thing and deny the proposed Negative Declaration, which represents cumulative and significant impacts, and move forward with a full Environmental Impact Report in compliance with CEQA.

Sincerely,

Donna Tisdale, Chair
691-766-4170
donnatisdale@hughes.net

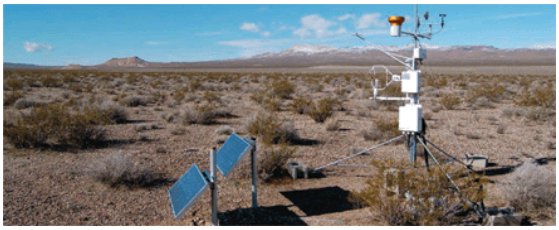
EXHIBIT 4

Science 13 June 2008:
Vol. 320. no. 5882, pp. 1409 - 1410
DOI: 10.1126/science.320.5882.1409

News of the Week

ECOSYSTEMS:
Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle?

Richard Stone



Waiting to exhale? CO_2 flux readings suggest that the Mojave Desert in Nevada is gulping carbon at the rate of a temperate forest.
Credit: Desert Research Institute, Nevada

URUMQI, CHINA--When Li Yan began measuring carbon dioxide (CO2) in western China's Gubantonggut Desert in 2005, he thought his equipment had malfunctioned. Li, plant ecophysiologist with the Chinese Academy of Sciences'Xinjiang Institute of Ecology and Geography in Urumqi, discovered that his plot was soaking up CO2 at night. His team ruled out the sparse vegetation as the CO2 sink. Li came to a surprising conclusion: The alkaline soil of Gubantonggut is socking away large quantities of CO2 in an inorganic form. A CO2-gulping desert in a remote corner of China may not be an isolated phenomenon. Halfway around the world, researchers have found that Nevada's Mojave Desert, square meter for square meter, absorbs about the same amount of CO2 as some temperate forests. The two sets of findings suggest that deserts are unsung players in the global carbon cycle. "Deserts are a larger sink for carbon dioxide than had previously been assumed," says Lynn Fenstermaker, a remote sensing ecologist at the Desert Research Institute (DRI) in Las Vegas, Nevada, and a co-author of a paper on the Mojave findings published online last April in Global Change Biology.

The effect could be huge: About 35% of Earth's land surface, or 5.2 billion hectares, is desert and semiarid ecosystems. If the Mojave readings represent an average CO2 uptake, then deserts and semiarid regions may be absorbing up to 5.2 billion tons of carbon a year--roughly half the amount emitted globally by burning fossil fuels, says John "Jay" Arnone, an ecologist in DRI's Reno lab and a co-author of the Mojave paper. But others point out that CO2 fluxes are notoriously difficult to measure and that it is necessary to take readings in other arid and semiarid regions to determine whether the Mojave and Gubantonggut findings are representative or anomalous.

For now, some experts doubt that the world's most barren ecosystems are the longsought missing carbon sink. "I'd be hugely surprised if this were the missing sink. If deserts are taking up a lot of carbon, it ought to be obvious," says William Schlesinger, a biogeochemist at the Cary Institute of Ecosystem Studies in Millbrook, New York, who in the 1980s was among the first to examine carbon flux in deserts. Nevertheless, he says, both sets of findings are intriguing and "must be followed up."

Scientists have long struggled to balance Earth's carbon books. While atmospheric CO2 levels are rising rapidly, our planet absorbs more CO2 than can be accounted for. Researchers have searched high and low for this missing sink. It doesn't appear to be the oceans or forests--although the capacity of boreal forests to absorb CO2 was long underestimated. Deserts might be the least likely candidate. "You would think that seemingly lifeless places must be carbon neutral, or carbon sources," says Mojave co-author Georg Wohlfahrt, an ecologist at the University of Innsbruck in Austria.

About 20 kilometers north of Urumqi, clusters of shanties are huddled next to fields of hops, cotton, and grapes. Soon after the Communist victory over the Nationalists in 1949, soldiers released from active duty were dispatched across rural China, including vast Xinjiang Province, to farm the land. At the edge of the sprawling "222" soldier farm, which is home to hundreds of families, oasis fields end where the Gubantonggut begins. The Fukang Station of Desert Ecology, which Li directs, is situated at this transition between ecosystems.

In recent years, average precipitation has increased in the Gubantonggut, and the dominant Tamarix shrubs are thriving. Li set out to measure the difference in CO2 absorption between oasis and desert soil. An automated flux chamber measured CO2 depletion a few centimeters above the soil in 24-hour intervals on select days in the growing season (from May to October) in 2005 and in 2006. The desert readings ranged from 62 to 622 grams of carbon per square meter per year. Li assumed that Tamarix and a biotic crust of lichen, moss, and cyanobacteria up to 5 centimeters thick are responsible for part of the uptake. To rule out an organic process in the soil, Li's team put several kilograms in a pressure steam chamber to kill off any life forms and enzymes. CO2 absorption held steady, according to their report, posted online earlier this year in Environmental Geology.

"The sterilization treatment was impressive," says biogeochemist Pieter Tans, a climate change expert with the U.S. National Oceanic and Atmospheric Administration in Boulder, Colorado. "They may have found a significant effect, previously neglected, but I would like to see more evidence." Indeed, the high end of the Urumqi CO2 flux estimates are off the charts. "That's more carbon uptake than our fastest growing southern forests. It's a huge number. I find it extremely hard to believe," says Schlesinger, who nonetheless says the Chinese team's methodology looks sound.

Missing sink? *Tamarix* shrubs are thriving in China's Gubantonggut Desert, but the soil itself may be socking away far more CO_2 at night. Credit: M. Stone

At first, Li was flummoxed. Then, he says, he realized that deserts are "like a dry ocean." The pH of oceans is falling gradually as they absorb CO2, forming carbonic acid. "I thought, 'Why wouldn't this also happen in the soil?' " Whereas the ocean has a single surface for gas exchange, Li says, soil is a porous medium with a huge reactive surface area. One question, Tans notes, is why the desert soils would remain alkaline as they absorb CO2. Li suggests that ongoing salinization drives pH in the opposite direction, allowing for continual CO2 absorption. But where the carbon goes--whether it is stowed largely as calcium carbonate or other salts--is unknown, Li says. Schlesinger too is stumped: "It takes a long time for carbonate to build up in the soil," he says. At the apparent rate of absorption in China, he says, "we'd be up to our ankles in carbon." One possibility, DRI soil chemist Giles Marion speculates, is that at night, CO2 reacts with moisture in the soil and perhaps with dew to form carbonic acid, which dissolves calcium carbonate--a reaction that warmer temperatures would drive in reverse, releasing the CO2 again during the day. (Unlike most minerals, carbonates become more soluble at lower temperatures.) In that case, Marion says, Li's nighttime absorption would tell only half the story: "I would expect that over a year, there would be no significant increase in soil storage due to this process," he says, as the dynamic of carbon sequestration in the soil would vary from season to season. Li agrees that this scenario is plausible but notes that his daytime measurements of CO2 flux did not negate the nighttime uptake.

In any case, other researchers say, absorption alone cannot explain the substantial uptake in the Mojave. Wohlfahrt and his colleagues measured CO2 flux above the loamy sands of the Nevada Test Site, where the United States once tested its nuclear arsenal. From March 2005 to February 2007, the desert biome absorbed on average roughly 100 grams of carbon per square meter per year--comparable to temperate forests and grassland ecosystems--the team reported in its Global Change Biology paper.

Three processes are probably involved in CO2 absorption, Wohlfahrt says: biotic crusts, alkaline soils, and expanded shrub cover due to increased average precipitation. "We currently do not have the data to say where exactly the carbon is going," he says. Like the Urumqi team, Wohlfahrt and his colleagues observed CO2 absorption at night that cannot be attributed to photosynthesis. "I hope we can corroborate the Chinese findings in the Mojave," he says. Arnone and others, however, believe that carbon storage in soil is minimal.

Wohlfahrt suspects biotic crusts play a key role. "People have almost completely neglected what's going on with the crusts," he says. Others are not so sure. "I'm mystified by the Mojave work. There is no way that all the CO2 absorption observed in these studies is due to biological crusts, as there are not enough of them active long enough to account for such a large sink," says Jayne Belnap of the U.S. Geological Survey's Canyonlands Research Station in Moab, Utah. She and her colleagues have studied carbon uptake in the southern Utah desert, which has similar crust species. "We do not see any such results," she says.

Provided the surprising CO_2 sink in the deserts is not a mirage, it may yet prove ephemeral. "We don't want to say that these ecosystems will continue to gain carbon at this rate forever," Wohlfahrt says. The unexpected CO_2 absorption may be due to a recent uptick in precipitation in many deserts that has fueled a visible surge in vegetation. If average annual rainfall levels in those deserts were to abate, that could release the stored carbon and lead to a more rapid buildup of atmospheric CO_2--and possibly accelerate global warming.

Science. ISSN 0036-8075 (print), 1095-9203 (online)

EXHIBIT 5

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Reply To: 6320.0010(10)
File Name: 2010 EFSC ASC Summit Ridge Cmts 09202010
TS Number: 10-1494
TAILS: 13420-2009-FA-0217

September 20, 2010

Sue Oliver
Energy Facility Siting Officer
Oregon Department of Energy
245 Main Street, Suite C
Hermiston, OR. 97838

Subject: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind project, Wasco County, Oregon

Dear Ms. Oliver:

The Fish and Wildlife Service (Service) has reviewed the August 24, 2010, Application for a Site Certificate (ASC) for the proposed Summit Ridge Wind Project (Project) to be located in Wasco County, Oregon. The proposed Project will include up to 87 wind turbines (2.0 to 3.0 MW each) with a total nominal generating capacity of approximately 200 MW of electricity. The Project will include about 19 miles of new access roads, turbine foundations, underground and overhead electrical collection systems, meteorological towers, and an operations and maintenance building. The Project will also include a communications system, a substation, and interconnection facilities to tie into the transmission line, located to the west of the project. The transmission feeder line will be an overhead 230 kV (kilovolt) line and will be approximately eight miles long.

Much of the project site is agricultural land used for dry land winter wheat production. The proposed facility would be built on land one to four miles west of the Deschutes River Canyon extending from approximately river mile 7 on the north end of the project boundary to river mile 31 on the south end. The Service supports the use of disturbed habitats for the placement of wind energy generation. However, we remain concerned regarding short and long-term Project impacts to migratory birds including bald and golden eagles, and bats.

The Service supports renewable energy and the economic benefits that wind energy generation brings to local communities. We also recognize wind power development has the potential to impact wildlife and habitat resources. The Service provided comments on the Notice of Intent to Apply for an Energy Facility Site Certificate (NOI) for the Project in a letter dated July 13, 2009, and Preliminary ASC in a letter dated November 18, 2009. We appreciate the opportunity to

provide additional comments, and we look forward to working with you and LotusWorks on this important project.

Our previous comment letters focused on: (1) the potential for project specific mortality to birds and bats, including cumulative impacts of wind energy projects within the Columbia River corridor; and (2) measures to avoid or minimize Project impacts and adequate mitigation to offset unavoidable project impacts to biological resources. The Service subsequently received information in an email on June 24, 2010, from LotusWorks documenting the presence of golden eagles, large stick nests, and bald eagles in the project vicinity. Our comments below will focus on project impacts to bald and golden eagles and other migratory birds. We refer you to our previous two letters referenced above regarding other issues of concern.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, and nests except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during specific wind project operations even if all known reasonable, effective measures to protect birds are implemented. The Service's Office of Law Enforcement (OLE) carries out its mission to protect migratory birds through investigations and enforcement as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the OLE focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take.

Additionally, the Bald and Golden Eagle Protection Act (BGEPA) prohibits the taking of golden and bald eagles except when specifically authorized by the Department of the Interior (16 U.S.C. 668-668d). The Service has new regulations (Federal Register 74:46836-46879; 11 September 2009) (USFWS 2009) that may eventually allow a wind project to receive a permit to take golden or bald eagles under the BGEPA (50 CFR 22.26), for programmatic actions that are consistent with the goal of stable or increasing eagle breeding populations. Therefore, we encourage LotusWorks to work closely with the Service to identify available protective measures and develop an Avian and Bat Protection Plan (ABPP) and implement those measures prior to and during Project construction and operation.

The Service's goal for golden and bald eagles is stable or increasing breeding populations. Data from long-term studies of golden eagle migration, population models, and surveys sponsored by the Service indicate cause to be concerned about population trends for golden eagle (Millsap and Allen 2006, Good et al. 2007, Farmer et al. 2008, Smith et al. 2008, USFWS 2009). The Service was sufficiently concerned regarding the status of golden eagles that we determined, until further data shows golden eagle populations can withstand additional take, we will only consider BGEPA permit issuance of new golden eagle take for safety emergencies and for projects that

result in net benefits to golden eagles. Bald eagle permit issuance criteria would limit permits to only 5% of the Maximum Sustainable Yield.

Project Impacts and Service Recommendation

Golden eagles and other bird species are known to collide with wind turbines and transmission lines. Studies for the Project document the presence of golden eagles (12 detections) and three inactive large stick nests that were likely golden eagle nests, with a fourth nest that may have been built by golden eagles. These nests were located within 1,000 to 10,000 feet from Project wind turbines (Northwest Wildlife Consultants, Inc. 2010). Additionally, adult bald eagles were observed (4 detections) on or in proximity to the Project. The Service is concerned regarding the potential for injury or mortality from a turbine strike, transmission line collision, or other Project-related disturbance to bald and golden eagles. The Project studies and reports provide only a limited eagle impact analysis.

With the expected growth of the wind industry in the western United States, the Service anticipates that the number of golden eagles killed annually will multiply. The Service is concerned that the population trend of golden eagle will drop even more rapidly as a result of collisions with wind turbines, resulting in greater conflicts between renewable energy industry and agencies. Ultimately, fewer golden eagles will exist unless we find solutions to either greatly reduce golden eagle mortalities at wind projects, reduce other sources of mortality to off-set losses of golden eagles from wind farms, or enhance golden eagle populations with habitat or other reforms.

In the absence of clear solutions to address golden eagle mortalities at wind energy projects, to enhance populations through conservation measures, or to off-set losses in other ways, our best efforts should be directed at avoidance of mortalities by siting wind turbines well away from areas where resident and migrating eagles are known to concentrate their activities. The Service believes the Project, including all turbines, transmission and roads, and associated facilities has the potential to result in injury and mortality of individual golden eagles and potential loss of nest sites over the life of the Project.

The Service recommends that LotusWorks prepare an Avian and Bat Protection Plan consistent with the Service "white paper" titled *Consideration for Avian and Bat Protection Plans* (FWS 2010) that addresses bald and golden eagles, other migratory bird species of concern, and bats. We recommend that the Oregon Department of Energy defer the approval of the Project site certificate until an Avian and Bat Protection Plan is completed, and available for review. We further recommend the following measures be incorporated into any site certificate approval:

To reduce the likelihood of golden eagle take and to minimize Project impacts, we recommend the following measures be included in the development of the Project:

1. Minimize the potential for resident golden eagle collisions by locating individual Project wind turbines a sufficient distance from golden eagle nest sites. Based on the best information available to us, a radius of a minimum of six miles from a golden eagle nest to the nearest turbine will likely avoid take of adult golden eagles associated with that nest. Any wind turbines proposed closer than six miles to golden eagle nests should not

be constructed until specific golden eagle studies have been implemented that define areas where no golden eagle use occurs (see studies in #2, below). These golden eagle-specific data should then be integrated into a protective turbine location "micrositing" design where turbines within six miles of a golden eagle nest are only sited in areas determined to be golden eagle non-use locations;

2. Conduct site specific studies to help define areas of use and non-use by golden eagles including:

    - Complete nest surveys within six miles of the Project location;
    - Conduct observation-post studies to observe the behavior of the adults (if present) without disturbing nesting behavior. These studies collect information on territory occupancy, productivity, fledging success, foraging and winter habitat and other information per the Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010); and
    - Satellite telemetry of nesting golden eagles within six miles of Project location.

3. Develop a Project construction plan that fully integrates avoidance of golden eagle disturbance during construction activities by implementing concurrent protective timing windows and distance buffers during sensitive nesting and fledging activities.

    - Distance and timing: Construction and maintenance activities between January 1 and July 15 should not be conducted within 1 mile of an active golden eagle nest (or ½ mile if not line-of-sight), unless site specific surveys indicate otherwise.

The Service has regulations in place that allow us to issue 'Programmatic Permits' to project applicants whose developments have the potential to incidentally 'take' golden eagles over extended periods of time. The Service is not currently issuing those permits, but is developing conditions that will likely be components of them. Permit conditions will likely include,, appropriate Advanced Conservation Practices - measures that represent the best available techniques to reduce take to a level where additional take is unavoidable: and permit conditions will also likely include mitigation measures to offset whatever birds are taken so that the effect of the Project on eagles will be consistent with the Service's goal of stable or increasing breeding populations. It is possible that a programmatic permit issued by the Service when it becomes available, would include as permit conditions many of the recommendations for monitoring, adaptive management and conservation actions described below:

1. Develop and implement a golden eagle monitoring plan (including monitoring of Project-related golden eagle mortality, golden eagle territory occupancy, nest success, and productivity) over the life of the Project to ensure all golden eagles injured or killed by wind turbines or other impacts to golden eagles are immediately identified and reported.

2. Develop and implement an adaptive management plan to address new information that is obtained during operation of the Project, including all turbines, transmission, and roads, and connected wind projects that effectively address any identified problems.

- Utilize turbine feathering and cut-in speeds of 5 m/sec to 6 m/sec at times of low wind speed to reduce bird (and bat) fatalities;
- Lock rotors during daytime and at night during peak migration periods and peak presence of migrating birds and bats;
- Specific commitment to integrate turbine operation curtailment (seasonally or permanently) into Project management to minimize impacts to bald and golden eagles;
- Specific commitment to remove turbines if they are found to cause repeated mortalities of golden or bald eagles;
- Experimental procedures (e.g. blade painting for higher visibility);
- Minimize lighting associated with the Project including:
    a) FAA visibility lighting of wind turbines should employ only strobed, strobe-like, or blinking incandescent lights, preferably with all lights illuminating simultaneously; and
    b) Keep lighting at both operation and maintenance facilities and substations located within ½ mile of the turbines to a minimum level by using motion or infrared light sensors and switches to keep lights off when not required, shield operation lights downward, and do not use high intensity, steady burning, bright lights; and
- Commitment to implement future technology when available.

Additionally, specific conservation actions should be collaboratively developed with the Service to meet the conservation goal of stable or increasing breeding populations of golden and bald eagles. The Service cannot permit take of golden eagles; however were we able to, we would look for the types of measures identified below to potentially offset such take in a manner that is consistent with the goal of stable or increasing breeding populations of golden eagles. The local-area eagle population of concern in this case is the area encompassed by a circle 140 miles from the Project boundary, by definition (USFWS 2009). This is the area within which we would expect evaluations of the effects of this Project on eagles would take place. The following should guide any collaborative development of proposed conservation measures:

- Ensure no net loss or an increase in golden eagles in the local-area population via:
    - Land acquisitions or easement purchases;
    - Nest site protection;
    - Habitat enhancement via:
        - Restoration projects (e.g. juniper removal in shrub-steppe systems that will enhance prey base);
        - Grassland restoration efforts with native grasslands;
        - Cheatgrass control programs;
        - Nest platforms;
        - Nest enhancements;
    - Reduce electrocution mortality via partnering with utilities to implement Avian Power Line Interaction Committee standard (APLIC 2006) retrofits of problem distribution lines;
    - Reduce losses to lead poisoning via:
        - Education program on lead poisoning;

  - Raptor rehabilitation centers;
- Contribute to regional or population-wide monitoring and research on golden eagles and wind turbines to better inform management across the West.

Conclusion

The Service appreciates the opportunity to comment on the ASC for the Summit Ridge Wind Project. We support well-designed wind projects that are carefully sited on habitats that will result in less impacts to Service trust resources. We recommend that the Oregon Department of Energy defer the approval of the Project site certificate until an Avian and Bat Protection Plan is completed, and available for review. We further recommend the measures outlined in this letter be incorporated into any site certificate approval. The Service is available to continue to work with LotusWorks in the review, development, mitigation, and monitoring of the Project.

If you have any questions regarding the Service's comments or desire to meet with us to discuss these issues further, please contact Jerry Cordova or me at (541) 383-7146.

Sincerely,

Nancy Gilbert

Nancy Gilbert
Field Supervisor

cc:
Steve Cherry, Oregon Department of Fish and Wildlife, Heppner, Oregon
Chris Carey, Oregon Department of Fish and Wildlife, Bend, Oregon
Mike Green, US Fish and Wildlife Service, Migratory Birds, Portland, Oregon
Doug Young, US Fish and Wildlife Service, Oregon Fish and Wildlife Office, Portland, Oregon
Robert Romero, US Fish and Wildlife Service, R1 Law Enforcement, Oregon

References

Avian Power Line Interaction Committee (APLIC). 2006. Suggested practices for avian protection on power lines: the state of the art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission, Washington, D.C. and Sacramento, CA.

Farmer, C.J., L.J. Goodrich, E. Ruelas Inzunza, and J.P. Smith. 2008. Conservation status of North America's birds of prey. Pp. 303 – 420 *In* K.L. Bildstein, J.P. Smith, E. Ruelas Inzunza and R.R. Veit (eds.). State of North America's birds of prey. Series in Ornith. # 3, Nuttall Ornith. Club and the Am. Ornith. Union.

Good, R.E., R.M. Nielson, H. Sawyer, and L.L. McDonald. 2007. A population estimate for golden eagles in the western United States. J. Wildl. Manage. 71:395-402.

Millsap, B.A., and G.T. Allen. 2006. Effects of falconry harvest on wild raptor populations in the United States: theoretical considerations and management recommendations. Wildl. Soc. Bull. 34:1392-1400.

Northwest Wildlife Consultants, Inc. (NWC) 2010. Ecological Baseline Studies and Impact Assessment for the Summit Ridge Wind Power Project, Summit Ridge Wind Power Project. March 22, 2010. Pendleton, OR. and Goldendale, WA. 85 pages.

Northwest Wildlife Consultants, Inc. (NWC) 2010. Summit Ridge Wind Project Habitat Mitigation Plan, Summit Ridge Wind Power Project. March 30, 2010. Pendleton, OR. and Goldendale, WA. 4 pages.

Northwest Wildlife Consultants, Inc. (NWC) 2010. Summit Ridge Wind Project Wildlife Monitoring and Mitigation Plan, Summit Ridge Wind Power Project. March 30, 2010. Pendleton, OR. and Goldendale, WA. 9 pages.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle technical guidance: inventory and monitoring protocols; and other recommendations in support of eagle management and permit issuance. Division of Migratory Bird Management. US. Fish and Wildlife Service.

Smith, J.P., C.J. Farmer, S.W. Hoffman, G.S. Kaltenecker, K.Z. Woodruff, and P.F. Sherrington. 2008. Trends in autumn counts of migratory raptors in western North America. *In* K.L. Bildstein, J.P. Smith, E. Ruelas Inzunza and R.R. Veit (eds.). pp 217-254. State of North America's birds of prey. series in Ornith. # 3, Nuttall Ornith. Club and the Am. Ornith. Union.

U.S. Fish and Wildlife Service (FWS) 2009. Federal Register - 44. 74 FR 46836, Rules and regulations, Department of the Interior (DOI) United States Fish and Wildlife Service (FWS), 50 CFR Parts 13 and 22, [FWS-R9-MB-2008-0057; 91200-1231-9BPP-L2] RIN

1018-AV81, eagle permits; take necessary to protect interests in particular localities, part II, action: final rule. September 11, 2009.

U.S. Fish and Wildlife Service. 2010. Considerations for Avian and Bat Protection Plans. U.S. Fish and Wildlife Service White Paper. 11 pages.

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October 11, 2010

VIA EMAIL AND U.S. MAIL

Matt Schneider
Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, California 92123-1666
matthew.schneider@sdcounty.ca.gov

Re: Backcountry Against Dumps, the Protect Our Communities Foundation and East County Community Action Coalition's Scoping Comments on the San Diego County Wind Energy Ordinance (POD 10-007)

I. INTRODUCTION

These scoping comments are submitted on behalf of Backcountry Against Dumps ("BAD"), the Protect Our Communities Foundation ("POC") and East County Community Action Coalition ("ECCAC") (collectively "Conservation Groups") in response to San Diego County's (the "County's") Notice of Preparation of an Environmental Impact Report ("NOP") for the proposed Wind Energy Ordinance amendments, POD 10-007 ("Amendments" or the "Project"). Conservation Groups commend the County for deciding to prepare a full Program Environmental Impact Report ("PEIR") and appreciate the opportunity to submit these scoping comments thereon.

As described in detail in these scoping comments, the Amendments would have numerous significant impacts that must be analyzed in the PEIR under the California Environmental Quality Act ("CEQA"), Pub. Res. Code § 21000 *et seq*. These include not only the impacts the County determined, in its Initial Study ("IS"), to be potentially significant, but also impacts on water supply, wildfire and emergency response, and climate change.

Additionally, before the County prepares the PEIR, it should further revise the draft Amendments to clarify and/or improve several of their provisions. Most notably, the County should revise the Amendments to (1) give preference to distributed generation projects in

urbanized or otherwise already developed areas with substantial energy demand and (2) discourage large-scale energy projects on ecologically, culturally, or otherwise sensitive and irreplaceable open space or agricultural land.

II. CONSERVATION GROUPS ARE VITALLY CONCERNED

All three Conservation Groups are directly impacted by the County's proposed Amendments. BAD is a community organization comprising numerous individuals and families residing in the Boulevard region of eastern San Diego County. Members of BAD are directly affected by the County's land use planning and are keenly interested in the proper management of lands within the County in order to maintain and enhance their ecological integrity, scenic beauty, wildlife, recreational amenities, cultural resources, watershed values, and groundwater resources. Some members of BAD rely for their entire domestic, municipal, and agricultural water supply on the vulnerable aquifers of eastern San Diego County that are threatened with contamination and overdrafting by ongoing and proposed land use development. The Amendments present the potential for energy development that could harm the East County's natural resources, and BAD's members.

ECCAC is a coalition of community groups with the common goal of preserving their rural quality of life and the natural resources of eastern San Diego County. ECCAC and its members seek to maintain the ecological integrity, scenic beauty, wildlife, cultural resources, recreational amenities, watershed values, and groundwater resources in eastern San Diego County. ECCAC's members use County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments pose the potential to harm the use and enjoyment of these public resources by ECCAC's members as well as the public at large.

POC is a community organization composed of numerous individuals and families residing throughout eastern San Diego County who would be directly affected by projects that might be approved under the Ordinance as amended. POC's purpose is the promotion of a safe, reliable, economical, renewable and environmentally responsible energy future. POC's members use County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments and the consequent development of energy development projects and infrastructure it might allow threaten the use and enjoyment of these East County public resources by POC's members.

Accordingly, Conservation Groups respectfully request your careful attention to their comments which follow.

III. THE PEIR MUST IDENTIFY CUMULATIVE PROJECTS AND THOROUGHLY ANALYZE CUMULATIVE IMPACTS

CEQA mandates that EIRs "discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." 14 Cal. Code Regs. ("CEQA Guidelines") § 15130(a). And a project's incremental impact cannot be considered insignificant merely because the project and/or other future projects will "compl[y] with [a] specified plan or mitigation program addressing the cumulative problem." *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 115-16. Further, even where the lead agency determines that a project's incremental effect would not be cumulatively considerable, it must still "describe its basis for [so] concluding." CEQA Guidelines § 15130(a).

Here, the County must thoroughly address the Amendments' cumulative impacts in the PEIR. Further, the County may not rely solely on this Project's and future projects' compliance with the County's land use and other regulations to conclude that the Amendments will not have cumulative impacts. *See Communities for a Better Environment*, *supra*, 103 Cal.App.4th at 115-16; *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443 fn. 8 (city "cannot . . . avoid [CEQA] responsibility for its decision to amend the general plan and rezone . . . site" to allow development of wetlands on ground another agency would regulate and mitigate wetlands impacts). However, the County frequently makes this error in its cumulative impact analyses in the IS. *See, e.g.,* Initial Study ("IS"), pp. 12 ("Therefore, compliance with the Code ensures that the project will not create a significant new source of substantial light or glare, which would [have a significant impact] on a project or cumulative level"), 24 (because specific future projects would require discretionary permits the significant archaeological resources would then be sufficiently protected such that a project would not contribute to a "cumulatively considerable impact"). The County must bolster its analysis and not make the same mistake in the PEIR.

Additionally, the County must be sure to include in its PEIR cumulative impact analyses existing and planned projects occurring on federal land and Indian reservations within and adjacent to San Diego County, which it fails to do in the IS.[1] Not only will these projects contribute substantially to cumulative impacts, many of them are also subject to County

[1] These projects include the existing Southwest Powerlink transmission line, the Sunrise Powerlink transmission line project, the ECO Substation project, the Energia Sierra Juarez Transmission Line project, the Boulevard Substation expansion, the existing Kumeyaay wind facility, Invenergy's 160 MW Crestwood Wind project, Pacific Wind Development's Tule Wind Energy project, the Esmeralda-San Felipe Geothermal project and Imperial Valley Solar, L.L.C.'s 709 MW Imperial Valley Solar Project, among others.

regulation, something the County should consider in deciding how best to mitigiate cumulative impacts. *California Coastal Commission v. Granite Rock Co.*, 480 U.S. 572, 579-593 (1987)

IV. THE AMENDMENTS WILL HAVE NUMEROUS SIGNIFICANT ENVIRONMENTAL IMPACTS THAT MUST BE ANALYZED IN THE PEIR

It is self-evident from the text of the Amendments that the proposed zoning changes would allow greater development and higher densities of wind energy projects than under the current zoning regulations. To wit, the Amendments would (1) significantly reduce the setback requirements for wind energy projects, (2) substantially increase the allowable wind turbine height for both small and large wind projects, and (3) explicitly allow, for the first time, large wind projects to produce electricity for offsite use. Combined with the planned electricity transmission capacity enhancement projects in the region, including the Sunrise Powerlink transmission line project, the ECO Substation project and others, the changes to existing zoning regulations would make it much more likely that companies and individuals would locate new wind projects, particularly large-scale projects geared towards producing power for offsite use, in San Diego County.[2] The likely increase in the total number of wind projects, combined with the increased allowable height and density of such projects, would pose many potentially significant environmental impacts that must be carefully examined in the PEIR. These impacts include those on visual resources, agricultural resources, air quality, biological resources, cultural resources, fire and emergency response, geological and soil resources, hazards and hazardous materials, hydrology, water supply and quality, land use planning, noise, public services, recreation, and transportation and utilities, among others. Some of the more prominent impacts are discussed below.

A. Impacts on Visual Resources

By explicitly allowing for the development of large wind projects that would produce electricity for offsite use, increasing the allowable height of wind turbines, and reducing the required setbacks (increasing allowable density) for wind energy projects, the Amendments would likely have significant impacts on visual resources. Because wind turbines are generally located on or near ridgelines or in vast open areas, they tend to be extremely visible. For example, the existing Kumeyaay wind turbines on the Campo Reservation in San Diego County are visible from miles around, both during the daytime and at night (due to their blinking red

[2] Two of the biggest impediments to development of renewable energy sources are (1) lack of transmission infrastructure and (2) local and state permitting, which can be both restrictive and costly. Beck, Frederic and Eric Martinot, June 2004, "Renewable Energy Policies and Barriers, in Cutler J. Cleveland (Ed.), 2004, *Encyclopedia of Energy*, Vol. 5, pp. 365-83 (downloadable version available at http://martinot.info/Beck_Martinot_AP.pdf).

night lights and flashing bright white strobe lights). As such, particularly with the increase in the number, density, and height of wind energy projects that can be expected, the Amendments are likely to cause significant aesthetic impacts. This becomes even more apparent when considered alongside the burgeoning development of other energy projects in San Diego County and the nearby region, as discussed above. The combined impacts of existing projects, planned projects and the future projects that can be expected under the Amendments are likely to be cumulatively significant.

B. Impacts on Biological Resources

The Amendments would have many significant biological impacts that must be analyzed in the PEIR. For one, there are numerous threatened, endangered or special status species that inhabit eastern San Diego County lands proposed for energy development, including the Quino checkerspot butterfly and the Peninsular bighorn sheep. Both of these species have suitable, inhabited, and/or designated critical habitat that already overlaps with or is adjacent to existing and currently proposed energy project sites. When these current and future encroachments are considered alongside those that would likely be caused by projects approved under the Amendments, there is a high risk of substantial cumulative impact.

As a specific example of a potentially cumulatively significant impact to threatened and endangered species, the Peninsular bighorn sheep are already threatened with being cut off from their most important migration corridor due to the Sunrise Powerlink project and the proposed La Rumorosa wind projects and their associated transmission facilities. As currently planned, those projects would be located directly adjacent to (and perhaps overlap with) the Peninsular Ranges of Mexico, an area which the U.S. Fish and Wildlife Service views as "the *only* possible route for a natural connection with other bighorn sheep populations for the [distinct population segment of sheep] in the U.S." 74 Fed. Reg. 17288, 17311 (2009) (emphasis added). By further impeding the sheep's access to this genetically important route, projects approved under the Amendments would be contributing to a significant cumulative impact. Additionally, the Tule Wind project in the McCain Valley threatens to degrade bighorn sheep designated critical habitat as well as extensive occupied habitat in the area. These projects, combined with the projects that the Amendments will facilitate, will cumulatively and significantly affect bighorn sheep in ways that have not been studied in any environmental review.

Another likely significant impact of the Amendments is avian injury and mortality, including impacts on both special status birds (such as the California condor) and others (such as the golden eagle, which is protected by the Bald and Golden Eagle Protection Act and United States Fish and Wildlife Service's ("FWS'") regulations thereunder, Federal Register 74:46836-46879, September 11, 2009). There is already clear evidence from the Altamont Pass area and

elsewhere that wind turbines kill thousands of birds (as well as bats and other flying creatures) each year.[3] Because projects approved under the Amendments would invariably contribute to them, the impacts of wind turbines, power lines and noise and light pollution from energy projects on flying creatures must be described and analyzed in the PEIR. Furthermore, in line with FWS' recent recommendations for wind energy projects, the County should add an additional amendment to the Ordinance requiring a minimum six-mile buffer between any proposed wind turbine and a golden eagle nest.[4]

The Amendments would also threaten the significant impact of habitat fragmentation. Habitat fragmentation is the breaking up of contiguous natural habitats into small patches that are isolated from intact areas of habitat. Through the construction, staging and building of access roads and structures, the energy developments approved under the Amendments, particularly the large projects that would produce energy for offsite use, would likely result in direct loss of habitat, division of the remaining habitat into isolated patches, and reduced size of habitat patches. These fragmentation impacts, when spread across a large area, are almost invariably accompanied by localized extirpation of species. Local species sensitive to the developed or altered edge and species that have large area requirements are among the first to disappear from habitat fragments, triggering cascading impacts to ecological communities. The fragmentation of habitats inhibits movement of species and disrupts necessary interactions among species. These adverse impacts decrease the viability of species in the area and degrade habitat value as species become more isolated in contained areas. These impacts must be fully analyzed in the PEIR.

Finally, it bears repetition that the potential for additional regulation by federal agencies such as the Forest Service and the Bureau of Land Management does not displace the County's vital regulatory authority and responsibility. *California Coastal Commission v. Granite Rock Co.*, *supra*, 480 U.S. at 579-593.
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[3] Smallwood, Shawn K., 2008, "Bird Mortality in the Altamont Pass Wind Resource Area, California," *The Journal of Wildlife Management* 2008-00-00, 215-223**;** Klinkenborg, Verlyn, 2008, "Our Vanishing Night," *National Geographic* 214(5), 102-123 (discussing general impacts of light pollution on wildlife); Malakoff, D., 2001, "Faulty towers," *Audubon* 103(5), 78–83 (discussing the severe impacts, including death, of brightly lit tall buildings on migrating birds; similar impacts can be expected with illuminated wind turbines).

[4] United States Fish and Wildlife Service, September 20, 2010, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, Oregon, p. 3 (attached to these comments as Exhibit 5).

C. Noise Impacts

As described below, there is substantial evidence that the secondary noise impacts of the Amendments would be significant. First, the Amendments set the maximum height of small wind turbines at 100 feet and require a minimum setback equal to the height of the turbine. While small wind projects are sometimes quieter, have fewer vibrational impacts and would thus require a lower setback than larger projects, it is also the case that some smaller turbines can be very noisy due to faster blade rotational speeds. As such, it is likely that small wind projects approved under the Amendments would have significant noise impacts on nearby residents, property owners and wildlife.

Second, there is substantial evidence that wind turbine noise causes both health and ecological impacts and thus that the County's 600 to 1,000 foot setback standard is insufficient. For example, based on her peer-reviewed research on the impacts of wind turbine noise, Dr. Nina Pierpont has identified a so-called "wind turbine syndrome" in people living near wind turbines, which is characterized by sleep problems, dizziness, headaches and other negative health symptoms.[5] Relatedly, the Society for Wind Vigilance released an analysis supporting Dr. Pierpont's basic conclusions and criticizing the American/Canadian Wind Energy Association's Wind Turbine Sound and Health Effects report, which downplayed the health impacts of wind turbine noise.[6] More recent studies also corroborate Dr. Pierpont's conclusions that wind turbine noise can cause substantial health impacts.[7]

To avoid the negative health impacts from wind turbines, Dr. Pierpont recommends setbacks from large wind projects of at least *1.25 miles*. A similar setback has been called for by the French National Academy of Medicine.[8] In his report for the Academy, Claude-Henri Chouard writes:

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[5] Pierpont, Nina, 2009, *Wind Turbine Syndrome: A Report on a Natural Experiment*, K-Selected Books: Santa Fé, NM.

[6] The Society for Wind Vigilance, January 2010, *Wind Industry Acknowledgment of Adverse Health Effects: An Analysis of the American/Canadian Wind Energy Association Sponsored "Wind Turbine Sound and Health Effects: An Expert Panel Review, December 2009*, available at http://www.windvigilance.com/awea_media.aspx.

[7] *See, e.g.,* Punch, Jerry, Richard James & Dan Pabst, 2010, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31 (attached to these comments as Exhibit 1); *see also* Nissenbaum, Michael A., March 2009, *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association (attached to these comments as Exhibit 2).

[8] Chouard, Claude-Henri, 2006, *Rapport: Le Retentissement du Fonctionnement des Éoliennes sur la Santé de l'Homme*

> The harmful effects of sound related to wind turbines are insufficiently assessed . . . . The sounds emitted by the blades being low frequency, which therefore travel easily and vary according to the wind, . . . constitute a permanent risk for the people exposed to them. . . . The Academy recommends halting wind turbine construction closer than 1.5 km from residences.[9]

In addition to the scientific evidence of health impacts from wind turbine noise, there is anecdotal evidence from residents of rural San Diego County that wind turbine noise impacts are significant. The Boulevard Planning Group's comments on the earlier solar and wind energy ordinance amendments, proposed in March 2010, state that in "Boulevard, off-reservation residents within several miles of the existing Kumeyaay Wind project complain of frequent noise and vibration impacts." Boulevard Planning Group's March 11, 2010 Comment Letter re: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006) ("BPG Comments") (attached as Exhibit 3), p. 13. Another Boulevard resident was quoted in a KPBS news story as confirming that "[t]here is a noise problem and also there's a – what's called wind turbine syndrome. . . . You can hear noise 24 hours a day. It sounds like a large truck on the freeway that never goes away; it's just constant."[10]

In sum, there is substantial evidence that the Amendments would have potentially significant secondary noise impacts via the wind projects approved under its auspices. These impacts must be fully analyzed in the PEIR. And to reduce some of these impacts, Conservation Groups recommend (1) that the setback standard be increased, and (2) that noise level measurements be taken at the nearest property line, rather than the nearest residence.

D. Climate Change Impacts

While the County's IS concludes that the Amendments would have a less than significant impact on climate change (IS, pp. 30-33), the IS fails to even mention several signficant sources of greenhouse gas emissions to which the Amendments will contribute. These sources must be fully analyzed in the PEIR.

First, there are fugitive emissions of SF6 – a potent greenhouse gas with a global warming potential of 23,900. These would result from the operation of the transmission line equipment used for the projects that would likely be approved under the Amendments, as well as any associated substations. These SF6 emissions would pose cumulatively significant impacts when combined with the emissions of the substantial existing and planned transmission-related infrastructure in and around San Diego County.

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[9] *Id*.

[10] http://www.kpbs.org/news/2010/jan/27/community-opposition-proposed-energy-projects/

Additionally, recent studies show that undisturbed alkaline desert areas, such as the Mojave Desert, eastern San Diego County and western Imperial County, sequester carbon-dioxide in surprising quantities.[11] Any large-scale wind projects approved under the Amendments would disturb and open up vast stretches of currently untrammeled desert lands to large-scale industrial development. These huge desert areas may do more good in reversing global warming if left alone than if they are fully developed into renewable energy generation facilities. This is particularly true where, as here, distributed photovoltaic energy production sited near the energy demand centers could eliminate or substantially reduce the need for the remote projects approved under the Amendments. A complete analysis of this indirect adverse impact of the Amendments, as well as the project-level and cumulative SF6 emissions impacts, must be conducted prior to the County's approval of the Amendments.

E. Wildfire and Emergency Response

Projects approved under the Amendments would likely increase fire risk and impede emergency response to a significant degree. And as such, these impacts must be fully analyzed in the PEIR. The magnitude of such risks is illustrated by the fire history in San Diego County. For example, San Diego Gas & Electric ("SDG&E") recently sought permission from the California Public Utilities Commission to turn off electrical power in the area of the ECO and Boulevard substations when fire dangers are high, a drastic measure from any perspective. If existing lines are so dangerous that SDG&E wants to shut off the power to thousands of people on windy days (potentially causing school shutdowns, disrupting emergency alert systems, and disabling hospital operations), the construction of even *more* energy projects, including any necessary substations and transmission lines, is very likely to have a significant impact on fire danger.

Furthermore, not only would the projects approved under the Amendments present fire hazards as new ignition sources, they would impede firefighters' efforts to combat wildfires. For example, any projects approved under the Amendments would require transmission and/or distribution lines that would create a substantial hazard for low-flying spotter and bomber aircraft that apply aerial retardant or water. It would be impossible to see those power lines in smoke filled canyons, and either pilots would be forced to risk their lives by flying when the lines are not clearly visible or aerial fire suppression would be stymied. Furthermore, in some cases the project-related transmission lines would need to be de-energized before firefighters could enter certain areas, giving the fire more time to spread.

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[11] Stone, Richard, "Ecosystems: Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle," *Science*, vol. 320 (5882), June 13, 2008, *available at*: http://www.ecostudies.org/press/Schlesinger_Science_13_June_2008.pdf (attached to these comments as Exhibit 4).

Clearly, the fire dangers presented by the Amendments and the projects that would be approved under them are significant and must be subjected to a full and accurate analysis in the PEIR.

F. Water Supply Impacts

Compounding the fundamental problems caused by geographical, seasonal, and interannual disjunctions, California's water supplies have become increasingly strained by continued population increases, global warming's significant impairment of the state's ability to capture and store mountain runoff, and reduced allocations from the major water sources including the Colorado River and State Water Project. As a result, it is essential that land use planning and development in the state be conducted in conjunction with water supply planning, and that developments be disallowed where sufficiently certain water sources are not available to serve them.

Indeed, as the California Supreme Court has recognized, CEQA imposes such a duty. In *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* 40 Cal.4th 412, 431 (2007), the Court articulated four main principles related to analysis of water supplies: (1) EIRs "cannot simply ignore[] or assume[] a solution to the problem of supplying water to a proposed land use project;" (2) water supply analyses for large multi-phase projects cannot be limited to the first phase or first few years of development; (3) the water supplies relied on in an EIR must have a likelihood of actually becoming available – "speculative sources and unrealistic allocations ('paper water') are insufficient bases for decisionmaking under CEQA;" and (4) when, despite a full discussion, uncertainty remains regarding future water supplies, CEQA requires that the EIR acknowledge the uncertainty and discuss reasonably foreseeable replacement sources or alternatives.

In light of the constraints on the state's water supply and the *Vineyard* decision, it is surprising that the County's Initial Study barely discusses water supply at all. In total, the IS devotes less than a page to the issue, and even then only to groundwater supplies. While the County concludes that "[m]ost wind energy systems are not expected to use any groundwater for any purpose," its contention contradicts common wind energy production practices. Initial Study, p. 43. According to the American Wind Energy Association, a 1.5 MW turbine operating at a 100% capacity factor for a full year would require 13,140 gallons of water per year, meaning a 100-turbine wind farm could use upwards of *1,314,000 gallons per year*, which is nearly 4 acre-feet per year. *See* BPG Comments, p. 12. In such an arid area, this quantity of water use is quite substantial and would likely have significant water supply impacts, whether on local aquifers or distant surface water sources. Thus, in contrast to the County's conclusion in the IS that the water supply impact would be less than significant, the Amendments' water supply

impact is likely to be quite significant. As such, the County must fully analyze the Amendments' secondary water supply impacts in the PEIR.

V. THE LANGUAGE OF THE ORDINANCE AND THE PROPOSED AMENDMENTS THERETO SHOULD BE CLARIFIED AND THEIR PROVISIONS SHOULD BE IMPROVED

Before preparing the PEIR on the Amendments, the County should clarify the language of the Ordinance and the Amendments and improve some of their provisions. First, as to clarifications, the County should amend the Ordinance's stating that large wind turbine systems may be located on parcels of "at least five acres." Given the required setbacks for large wind systems, a 5 acre parcel would not even support one large wind turbine.

Second, there are many improvements that the County should make to the Amendments. As discussed, the County should increase the required setbacks for wind energy projects. In addition, it should take noise level measurements from the nearest property line instead of the nearest residence. Further, the County should create and add to the Ordinance a minimum required buffer between any proposed wind turbine and a golden eagle's nest of at least six miles, per FWS' aforementioned guidance.

Most importantly, however, the County should emphasize distributed generation over wind projects that produce energy for offsite use. The County should adopt a policy that ranks renewable energy projects in a manner that gives preference to or otherwise incentivizes distributed generation projects in urbanized areas that have substantial existing infrastructure to be served by the locally produced electricity. Large-scale energy projects intended to produce electricity for offsite use should be discouraged, particularly in areas of ecologically or otherwise valuable open space or agricultural areas.

Not only would distributed generation have fewer environmental, health, safety, public utilities and other impacts, it is eminently feasible, arguably cheaper and has the potential to produce significant amounts of energy. For example, the California Energy Commission has determined that there are up to 60,929 MW of potential rooftop, photovoltaic, distributed generation in the state, not including commercial parking lots.[12] In San Diego County alone there are an estimated 2,600 MW of potential photovoltaic capacity on existing structures and already disturbed lands.
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[12] Public Interest Energy Research Program, California Energy Commission, *Distributed Renewable Energy Assessment: Final Report*, August 11, 2009, pp. 10 and 43.

VI. CONCLUSION

Conservation Groups commend San Diego County for deciding to prepare a full PEIR on the Amendments. Nonetheless, the preparation of an EIR in and of itself will not be enough to satisfy CEQA's requirements and ensure that the Wind Energy Ordinance is as environmentally beneficial as possible. The County must fully analyze the slew of significant impacts the Amendments would likely have, including those discussed in these scoping comments. And as part of its analysis, the County must account for the substantial number of other existing and proposed energy projects whose impacts are likely to combine with those of the projects approved under the Amendments to create cumulatively significant impacts. Furthermore, there are clarifications and improvements the County should make to the Amendments before preparing the PEIR, to both reduce the Amendments' environmental impacts and make the amended Ordinance more comprehensible.

Thank you for considering our comments on this important matter.

Respectfully submitted,

/s/ Stephan C. Volker

Stephan C. Volker
Attorney for Backcountry Against Dumps,
The Protect Our Communities Foundation, and
East County Community Action Coalition

SCV:taf

LIST OF EXHIBITS

1. Punch, Jerry, Richard James & Dan Pabst, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31.

2. Nissenbaum, Michael A., *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association, March 2009.

3. Boulevard Planning Group, Comment Letter re: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006), March 11, 2010.

4. Stone, Richard, "Ecosystems: Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle," *Science*, vol. 320 (5882), June 13, 2008.

5. United States Fish and Wildlife Service, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, September 20, 2010.

From:	Schneider, Matthew
To:	David Hochart
Subject:	FW: Blvd PG POD 10-007 EIR comment attachments
Date:	Wednesday, October 13, 2010 2:17:17 PM
Attachments:	Blvd PG to Sec Int wind invest 5-21-10.pdf pic27393.jpg pic06292.jpg pic14962.jpg pic14214.jpg pic12527.jpg pic26807.jpg pic13194.jpg pic08705.jpg pic14713.jpg pic07011.jpg pic18913.jpg pic06693.jpg pic19664.jpg pic26203.jpg pic28995.jpg pic17762.jpg pic14381.jpg

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Tel: 858-694-3714 Fax: 858-694-3373

From: donnatisdale@hughes.net [mailto:donnatisdale@hughes.net]
Sent: Monday, October 11, 2010 5:59 PM
To: Schneider, Matthew
Subject: Blvd PG POD 10-007 EIR comment attachments

Hello Matthew,

Here are the attachments for the Boulevard Planning Group's comments on the POD 10-007 EIR:
17 photos of wind turbine accidents / fires and the May 2010 letter to Secretary of Interior
asking for an investigation into the catastrophic failure at Kumeyaay Wind facility.

Thanks,

Donna Tisdale

619-766-4170

BOULEVARD PLANNING GROUP

P.O. BOX 1272, BOULEVARD, CA 91905

May 21, 2010

Ken Salazar, Secretary of Interior

Department of the Interior
1849 C Street, N.W.
Washington DC 20240

RE: REQUEST TO INVESTIGATE CASTASTROPHIC FAILURE AND ACCIDENTS AT KUMEYAAY WIND FACILITY & TO DENY FURTHER CATEGORICAL EXCLUSIONS FOR MET TEST TOWERS NEAR PRIVATE LAND.

Dear Secretary Salazar,

Our group is an elected community land use group advisory to the County of San Diego. The Boulevard Planning Area covers private land surrounding /abutting the Campo tribal lands in eastern San Diego County. Tribal members registered to vote in the area vote in our elections. **With this letter we are requesting three very important actions from you:**

- **Please conduct an investigation into the catastrophic failure and string of accidents at Kumeyaay Wind facility on the Campo Reservation.**
- **Address timely and proper disposal of damaged turbine blades and waste oil.**
- **Please deny further Categorical Exclusions for MET Towers for industrial wind energy projects on tribal lands within at least one mile of private lands.** *MET test towers represent industrial wind turbines. They are controversial and should be subject to the NEPA review process, public notice, and comment.* Six MET towers have been installed on the Campo Reservation by Invenergy Wind with more being planned in close proximity to private land and residences. Industrial wind projects represent negative impacts to public health and safety, quality of life, property values, and more. Impacted residents / property owners have a right to participate in the MET tower location process.

Call to investigate catastrophic failure and accidents at Kumeyaay Wind

Our group voted unanimously to send this letter requesting a formal investigation into the catastrophic failure at the Kumeyaay Wind facility during a significant weather event on December 7, 2009 where winds reached a reported 70 mph. The turbines are located on the Campo Reservation adjacent to Interstate 8. Witnesses driving on I-8 reported seeing a huge

electrical blue light flash that started near the center of the string of 25 Gamesa 1.5 MW turbines that lit up the sky and then arced out to all the turbines in both directions. See the linked articles: http://www.eastcountymagazine.org/node/2734 and http://www.signonsandiego.com/news/2010/jan/13/damaging-blow/ .

Another resident, a Manzanita tribal member who lives near the turbines, witnessed the same blue flash and arcing event from their yard and informed me that the following morning they saw large chunks of blades flopping and dropping as the damaged turbines continued to spin. The witness suspected that the brakes had become inoperable through a systemic failure. Employees were also seen collecting turbine parts. At various times since the 2005 startup of Kumeyaay Wind, witnesses have seen turbine and blade parts being collected from traffic lanes and center divider of adjacent I-8.

We are lucky that the December 7th electrical meltdown did not occur during a dry high-wind event which could have resulted in a catastrophic fire storm in this high fire danger zone. Eastern San Diego County, subject to Santa Ana wind events, suffered massive wildfires triggered by high winds and powerlines in 2003 and 2007. Other historic fires have devastated East County before, burning almost to the coast. Industrial wind turbines are subject to malfunction and to burst into flames spitting flaming debris onto the ground and vegetation around them. We see them as fire ignition sources in a remote area with limited emergency service capabilities.

Kumeyaay Wind facility was inoperable from the December 7th storm through March 2010. After extensive and repeated day and night crane work, the final turbine finally went back on line in late April. We suspect the last turbine, near the center of the string of turbines, may have been involved in the original failure and suffered the most damage. It is still undergoing frequent crane work.

The FAA required red warning lights located atop the 325 foot turbines do not appear to be in full operation. Some do not appear to be operating at all, while some are operating but are much dimmer than they were prior to the December 7, 2009 catastrophic failure event which took them all out. It is our understanding that the entire project has been plagued with problems since that failure which appears to have been electronic in nature.

After Kumeyaay Wind's failure, arguments ensued between insurance carriers, the turbine makers, and the project operators over who was at fault. Was the failure caused by a turbine / blade design flaw, a problem generated during construction / installation, operator error, a combination of problems, or what? There were online reports that the failure had become the topic of risk management conferences due to the incredibly expensive insurance payouts to replace the damaged turbine parts and to pay for the lost power generation**.**

Was /is the site properly grounded? Was / is it wired properly?

The original statement that the turbines had been struck by lightning in the December 7th storm was later denied. It has been speculated that the turbine blades had been turned to the wrong position which may have allowed too much friction to build up on the blades that then discharged creating the blue light ball and arcing. There are also concerns with the grounding of the turbines. It is our understanding that the re-bar in a properly constructed foundation is a key part of the grounding system. Sufficient bonding is required inside the foundation to allow lightning and fault currents to pass.

If bad or damaged wiring is involved it can lead to loss of turbine control and tower collapse. Here is a linked article on the investigation of collapsed wind turbine tower in New York state that was traced back to "questionable" wiring that did not allow the turbine to be properly controlled. http://www.brighterenergy.org/10427/news/wind/noble-environmental-power-faces-questions-over-wind-turbine-collapse/

The investigation into the New York turbine collapse reportedly uncovered *"a number of instances where best practices may not have been followed in terms of monitoring operations and where compliance with quality assurance/quality control measures and manufacturer's recommendations for inspection and maintenance of turbines may not have been fully implemented by Noble".* The New York Public Service Commission stated that, "*We must make sure that those installing and operating wind turbines do so properly"*. We hope you agree.

Where will the damaged blades and waste oil be disposed?

The December 7th storm damage resulted in all 75 blades from all 25 turbines being removed and replaced along with some of the nose cones. The damaged and discarded blades are still littering the ground at the base of the turbines, visible from I-8 and surrounding areas. It is our understanding that due to their composite makeup these multi-ton 150 foot or so long blades cannot be easily recycled and must be disposed of in a special manner. The cost to long-haul these huge blades, one per truck, to a distant special disposal facility must be incredibly expensive. There are also significant amounts of waste oil and hydraulic fluid generated by these enormous wind turbines. Where does it go? What are the waste storage / handling / disposal plans at this and other wind energy projects on the lands under your jurisdiction? Who is in charge of enforcing them? The Kumeyaay Wind facility is located within the federally designated Campo / Cottonwood Sole Source Aquifer which means we are totally reliant on our at-risk groundwater resources. Protection of our shared and priceless water resource is critical.

Kumeyaay Wind accidents

Tuesday, April 19th, several workers were injured by a high-voltage arc flash while inside a turbine nacelle at Kumeyaay Wind. One worker was struck in the face and was airlifted out. http://www.signonsandiego.com/news/2010/apr/20/one-worker-in-campo-accident-remains-hospitalized/

We have also received information that a large wind turbine motor was recently dropped during installation via a heavy duty crane and that a vehicle sitting on the ground below was crushed. Luckily, we heard that no workers were injured in this accident.

Who is responsible for quality control / assurance / oversight & regulation?

Is someone monitoring the accident rates at this and other wind energy projects on federal lands? Can more be done to prevent them? As you know, state and county agencies generally have no authority over operations conducted on tribal or other federal land. Our community cannot go to them for help with this project. Kumeyaay Wind is a private operation, approved through a lease agreement by the Bureau of Indian Affairs. It is located on sovereign tribal land that is held in trust by your agency. The Campo Band has informed us they are not in control of the project, in fact, they reportedly did not even receive any revenue from the project until last year, four years after it went into operation.

Our question to you, sir, is who is ultimately responsible for oversight and regulation of the Kumeyaay Wind energy project and those that are currently under consideration for the Campo, Manzanita and Ewiiapaayp tribal lands, and the Tule Wind project which is proposed on a combination of BLM and tribal lands--all of which fall under your jurisdiction? Does the buck stop with you? Please tell us.

Documentation of concerns

For your information, we have attached a copy of our well-researched letter submitted on February 15th during the formal comment period for the joint NEPA/CEQA review for the ECO Substation, Tule Wind and Energia Sierra Juarez projects. Tule Wind is proposed on both BLM land and tribal land, under your jurisdiction. The Bureau of Indian Affairs is a cooperating agency. A copy was previously provided directly to John Rydzik at the Pacific Regional Office.

Please contact me at 619-766-4170 or donnatisdale@hughes.net with any questions you may have. We thank you in advance to your prompt reply.

Sincerely,

Donna Tisdale, Chair

cc: Dale Morris, Pacific Regional Director

Robert Eben, Acting Superintendent, So Cal Agency

Interested Parties


Vestas


KuvatON.com
chan4chan.com


CAT

Schneider, Matthew

From: Dan Silver [dsilverla@me.com]
Sent: Wednesday, September 29, 2010 10:28 AM
To: Stiehl, Carl; Schneider, Matthew
Subject: Notice of Preparation for POD 10-007, WIND ENERGY ORDINANCE

Carl Stiehl
Matthew Schneider
Dept of Planning and Land Use
5201 Ruffin Rd, Suite B
San Diego, CA 92101

RE: POD 10-007, WIND ENERGY ORDINANCE

Dear Mr Stiehl and Mr Schneider:

The Endangered Habitats League appreciates the opportunity to comment on the NOP for this project. EHL supports the development of renewable energy sources, and the EIR provides an opportunity to achieve this goal in a way that avoids and minimizes environmental harm. Our biggest concern is harm to birds and bats. This potential impact should be assessed in the DEIR for turbines of all sizes.

The State of California *Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development* should be used in two general ways. First, the guidance should be used to *proactively* identify the most appropriate locations in the County for large turbines, so that concentrations or migratory paths of birds and bats can be avoided. These findings should be distributed to potential wind energy applicants *prior* to their purchasing interests in land or otherwise embarking on project planning. The goal is to integrate wildlife considerations at a point in the process where this information will have the most effect.

Secondly, no project should be approved that does not comply with the *Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development* in both siting and construction. This is a critical and feasible mitigation measure.

Also, as another mitigation measure, turbine designs (e.g., vertical) that are inherently more wildlife-friendly should be required for turbines of all sizes when feasible.

Thank you for considering our views, and please keep us on all mailing and distribution lists.

If your receipt of these comments could be acknowledged, that would be appreciated, thank you.

Sincerely,

Dan Silver, Executive Director
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October 11, 2010

VIA EMAIL AND U.S. MAIL

Matt Schneider
Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, California 92123-1666
matthew.schneider@sdcounty.ca.gov

Re: Backcountry Against Dumps, the Protect Our Communities Foundation and East County Community Action Coalition's Scoping Comments on the San Diego County Wind Energy Ordinance (POD 10-007)

I. INTRODUCTION

These scoping comments are submitted on behalf of Backcountry Against Dumps ("BAD"), the Protect Our Communities Foundation ("POC") and East County Community Action Coalition ("ECCAC") (collectively "Conservation Groups") in response to San Diego County's (the "County's") Notice of Preparation of an Environmental Impact Report ("NOP") for the proposed Wind Energy Ordinance amendments, POD 10-007 ("Amendments" or the "Project"). Conservation Groups commend the County for deciding to prepare a full Program Environmental Impact Report ("PEIR") and appreciate the opportunity to submit these scoping comments thereon.

As described in detail in these scoping comments, the Amendments would have numerous significant impacts that must be analyzed in the PEIR under the California Environmental Quality Act ("CEQA"), Pub. Res. Code § 21000 *et seq*. These include not only the impacts the County determined, in its Initial Study ("IS"), to be potentially significant, but also impacts on water supply, wildfire and emergency response, and climate change.

Additionally, before the County prepares the PEIR, it should further revise the draft Amendments to clarify and/or improve several of their provisions. Most notably, the County should revise the Amendments to (1) give preference to distributed generation projects in

urbanized or otherwise already developed areas with substantial energy demand and (2) discourage large-scale energy projects on ecologically, culturally, or otherwise sensitive and irreplaceable open space or agricultural land.

II. CONSERVATION GROUPS ARE VITALLY CONCERNED

All three Conservation Groups are directly impacted by the County's proposed Amendments. BAD is a community organization comprising numerous individuals and families residing in the Boulevard region of eastern San Diego County. Members of BAD are directly affected by the County's land use planning and are keenly interested in the proper management of lands within the County in order to maintain and enhance their ecological integrity, scenic beauty, wildlife, recreational amenities, cultural resources, watershed values, and groundwater resources. Some members of BAD rely for their entire domestic, municipal, and agricultural water supply on the vulnerable aquifers of eastern San Diego County that are threatened with contamination and overdrafting by ongoing and proposed land use development. The Amendments present the potential for energy development that could harm the East County's natural resources, and BAD's members.

ECCAC is a coalition of community groups with the common goal of preserving their rural quality of life and the natural resources of eastern San Diego County. ECCAC and its members seek to maintain the ecological integrity, scenic beauty, wildlife, cultural resources, recreational amenities, watershed values, and groundwater resources in eastern San Diego County. ECCAC's members use County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments pose the potential to harm the use and enjoyment of these public resources by ECCAC's members as well as the public at large.

POC is a community organization composed of numerous individuals and families residing throughout eastern San Diego County who would be directly affected by projects that might be approved under the Ordinance as amended. POC's purpose is the promotion of a safe, reliable, economical, renewable and environmentally responsible energy future. POC's members use County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments and the consequent development of energy development projects and infrastructure it might allow threaten the use and enjoyment of these East County public resources by POC's members.

Accordingly, Conservation Groups respectfully request your careful attention to their comments which follow.

III. THE PEIR MUST IDENTIFY CUMULATIVE PROJECTS AND THOROUGHLY ANALYZE CUMULATIVE IMPACTS

CEQA mandates that EIRs "discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." 14 Cal. Code Regs. ("CEQA Guidelines") § 15130(a). And a project's incremental impact cannot be considered insignificant merely because the project and/or other future projects will "compl[y] with [a] specified plan or mitigation program addressing the cumulative problem." *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 115-16. Further, even where the lead agency determines that a project's incremental effect would not be cumulatively considerable, it must still "describe its basis for [so] concluding." CEQA Guidelines § 15130(a).

Here, the County must thoroughly address the Amendments' cumulative impacts in the PEIR. Further, the County may not rely solely on this Project's and future projects' compliance with the County's land use and other regulations to conclude that the Amendments will not have cumulative impacts. *See Communities for a Better Environment*, *supra*, 103 Cal.App.4th at 115-16; *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443 fn. 8 (city "cannot . . . avoid [CEQA] responsibility for its decision to amend the general plan and rezone . . . site" to allow development of wetlands on ground another agency would regulate and mitigate wetlands impacts). However, the County frequently makes this error in its cumulative impact analyses in the IS. *See, e.g.,* Initial Study ("IS"), pp. 12 ("Therefore, compliance with the Code ensures that the project will not create a significant new source of substantial light or glare, which would [have a significant impact] on a project or cumulative level"), 24 (because specific future projects would require discretionary permits the significant archaeological resources would then be sufficiently protected such that a project would not contribute to a "cumulatively considerable impact"). The County must bolster its analysis and not make the same mistake in the PEIR.

Additionally, the County must be sure to include in its PEIR cumulative impact analyses existing and planned projects occurring on federal land and Indian reservations within and adjacent to San Diego County, which it fails to do in the IS.[1] Not only will these projects contribute substantially to cumulative impacts, many of them are also subject to County

[1] These projects include the existing Southwest Powerlink transmission line, the Sunrise Powerlink transmission line project, the ECO Substation project, the Energia Sierra Juarez Transmission Line project, the Boulevard Substation expansion, the existing Kumeyaay wind facility, Invenergy's 160 MW Crestwood Wind project, Pacific Wind Development's Tule Wind Energy project, the Esmeralda-San Felipe Geothermal project and Imperial Valley Solar, L.L.C.'s 709 MW Imperial Valley Solar Project, among others.

regulation, something the County should consider in deciding how best to mitigiate cumulative impacts. *California Coastal Commission v. Granite Rock Co.*, 480 U.S. 572, 579-593 (1987)

IV. THE AMENDMENTS WILL HAVE NUMEROUS SIGNIFICANT ENVIRONMENTAL IMPACTS THAT MUST BE ANALYZED IN THE PEIR

It is self-evident from the text of the Amendments that the proposed zoning changes would allow greater development and higher densities of wind energy projects than under the current zoning regulations. To wit, the Amendments would (1) significantly reduce the setback requirements for wind energy projects, (2) substantially increase the allowable wind turbine height for both small and large wind projects, and (3) explicitly allow, for the first time, large wind projects to produce electricity for offsite use. Combined with the planned electricity transmission capacity enhancement projects in the region, including the Sunrise Powerlink transmission line project, the ECO Substation project and others, the changes to existing zoning regulations would make it much more likely that companies and individuals would locate new wind projects, particularly large-scale projects geared towards producing power for offsite use, in San Diego County.[2] The likely increase in the total number of wind projects, combined with the increased allowable height and density of such projects, would pose many potentially significant environmental impacts that must be carefully examined in the PEIR. These impacts include those on visual resources, agricultural resources, air quality, biological resources, cultural resources, fire and emergency response, geological and soil resources, hazards and hazardous materials, hydrology, water supply and quality, land use planning, noise, public services, recreation, and transportation and utilities, among others. Some of the more prominent impacts are discussed below.

A. Impacts on Visual Resources

By explicitly allowing for the development of large wind projects that would produce electricity for offsite use, increasing the allowable height of wind turbines, and reducing the required setbacks (increasing allowable density) for wind energy projects, the Amendments would likely have significant impacts on visual resources. Because wind turbines are generally located on or near ridgelines or in vast open areas, they tend to be extremely visible. For example, the existing Kumeyaay wind turbines on the Campo Reservation in San Diego County are visible from miles around, both during the daytime and at night (due to their blinking red

[2] Two of the biggest impediments to development of renewable energy sources are (1) lack of transmission infrastructure and (2) local and state permitting, which can be both restrictive and costly. Beck, Frederic and Eric Martinot, June 2004, "Renewable Energy Policies and Barriers, in Cutler J. Cleveland (Ed.), 2004, *Encyclopedia of Energy*, Vol. 5, pp. 365-83 (downloadable version available at http://martinot.info/Beck_Martinot_AP.pdf).

night lights and flashing bright white strobe lights). As such, particularly with the increase in the number, density, and height of wind energy projects that can be expected, the Amendments are likely to cause significant aesthetic impacts. This becomes even more apparent when considered alongside the burgeoning development of other energy projects in San Diego County and the nearby region, as discussed above. The combined impacts of existing projects, planned projects and the future projects that can be expected under the Amendments are likely to be cumulatively significant.

B. Impacts on Biological Resources

The Amendments would have many significant biological impacts that must be analyzed in the PEIR. For one, there are numerous threatened, endangered or special status species that inhabit eastern San Diego County lands proposed for energy development, including the Quino checkerspot butterfly and the Peninsular bighorn sheep. Both of these species have suitable, inhabited, and/or designated critical habitat that already overlaps with or is adjacent to existing and currently proposed energy project sites. When these current and future encroachments are considered alongside those that would likely be caused by projects approved under the Amendments, there is a high risk of substantial cumulative impact.

As a specific example of a potentially cumulatively significant impact to threatened and endangered species, the Peninsular bighorn sheep are already threatened with being cut off from their most important migration corridor due to the Sunrise Powerlink project and the proposed La Rumorosa wind projects and their associated transmission facilities. As currently planned, those projects would be located directly adjacent to (and perhaps overlap with) the Peninsular Ranges of Mexico, an area which the U.S. Fish and Wildlife Service views as "the *only* possible route for a natural connection with other bighorn sheep populations for the [distinct population segment of sheep] in the U.S." 74 Fed. Reg. 17288, 17311 (2009) (emphasis added). By further impeding the sheep's access to this genetically important route, projects approved under the Amendments would be contributing to a significant cumulative impact. Additionally, the Tule Wind project in the McCain Valley threatens to degrade bighorn sheep designated critical habitat as well as extensive occupied habitat in the area. These projects, combined with the projects that the Amendments will facilitate, will cumulatively and significantly affect bighorn sheep in ways that have not been studied in any environmental review.

Another likely significant impact of the Amendments is avian injury and mortality, including impacts on both special status birds (such as the California condor) and others (such as the golden eagle, which is protected by the Bald and Golden Eagle Protection Act and United States Fish and Wildlife Service's ("FWS'") regulations thereunder, Federal Register 74:46836-46879, September 11, 2009). There is already clear evidence from the Altamont Pass area and

elsewhere that wind turbines kill thousands of birds (as well as bats and other flying creatures) each year.[3] Because projects approved under the Amendments would invariably contribute to them, the impacts of wind turbines, power lines and noise and light pollution from energy projects on flying creatures must be described and analyzed in the PEIR. Furthermore, in line with FWS' recent recommendations for wind energy projects, the County should add an additional amendment to the Ordinance requiring a minimum six-mile buffer between any proposed wind turbine and a golden eagle nest.[4]

The Amendments would also threaten the significant impact of habitat fragmentation. Habitat fragmentation is the breaking up of contiguous natural habitats into small patches that are isolated from intact areas of habitat. Through the construction, staging and building of access roads and structures, the energy developments approved under the Amendments, particularly the large projects that would produce energy for offsite use, would likely result in direct loss of habitat, division of the remaining habitat into isolated patches, and reduced size of habitat patches. These fragmentation impacts, when spread across a large area, are almost invariably accompanied by localized extirpation of species. Local species sensitive to the developed or altered edge and species that have large area requirements are among the first to disappear from habitat fragments, triggering cascading impacts to ecological communities. The fragmentation of habitats inhibits movement of species and disrupts necessary interactions among species. These adverse impacts decrease the viability of species in the area and degrade habitat value as species become more isolated in contained areas. These impacts must be fully analyzed in the PEIR.

Finally, it bears repetition that the potential for additional regulation by federal agencies such as the Forest Service and the Bureau of Land Management does not displace the County's vital regulatory authority and responsibility. *California Coastal Commission v. Granite Rock Co.*, *supra*, 480 U.S. at 579-593.
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[3] Smallwood, Shawn K., 2008, "Bird Mortality in the Altamont Pass Wind Resource Area, California," *The Journal of Wildlife Management* 2008-00-00, 215-223**;** Klinkenborg, Verlyn, 2008, "Our Vanishing Night," *National Geographic* 214(5), 102-123 (discussing general impacts of light pollution on wildlife); Malakoff, D., 2001, "Faulty towers," *Audubon* 103(5), 78–83 (discussing the severe impacts, including death, of brightly lit tall buildings on migrating birds; similar impacts can be expected with illuminated wind turbines).

[4] United States Fish and Wildlife Service, September 20, 2010, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, Oregon, p. 3 (attached to these comments as Exhibit 5).

C. Noise Impacts

As described below, there is substantial evidence that the secondary noise impacts of the Amendments would be significant. First, the Amendments set the maximum height of small wind turbines at 100 feet and require a minimum setback equal to the height of the turbine. While small wind projects are sometimes quieter, have fewer vibrational impacts and would thus require a lower setback than larger projects, it is also the case that some smaller turbines can be very noisy due to faster blade rotational speeds. As such, it is likely that small wind projects approved under the Amendments would have significant noise impacts on nearby residents, property owners and wildlife.

Second, there is substantial evidence that wind turbine noise causes both health and ecological impacts and thus that the County's 600 to 1,000 foot setback standard is insufficient. For example, based on her peer-reviewed research on the impacts of wind turbine noise, Dr. Nina Pierpont has identified a so-called "wind turbine syndrome" in people living near wind turbines, which is characterized by sleep problems, dizziness, headaches and other negative health symptoms.[5] Relatedly, the Society for Wind Vigilance released an analysis supporting Dr. Pierpont's basic conclusions and criticizing the American/Canadian Wind Energy Association's Wind Turbine Sound and Health Effects report, which downplayed the health impacts of wind turbine noise.[6] More recent studies also corroborate Dr. Pierpont's conclusions that wind turbine noise can cause substantial health impacts.[7]

To avoid the negative health impacts from wind turbines, Dr. Pierpont recommends setbacks from large wind projects of at least *1.25 miles*. A similar setback has been called for by the French National Academy of Medicine.[8] In his report for the Academy, Claude-Henri Chouard writes:

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[5] Pierpont, Nina, 2009, *Wind Turbine Syndrome: A Report on a Natural Experiment*, K-Selected Books: Santa Fé, NM.

[6] The Society for Wind Vigilance, January 2010, *Wind Industry Acknowledgment of Adverse Health Effects: An Analysis of the American/Canadian Wind Energy Association Sponsored "Wind Turbine Sound and Health Effects: An Expert Panel Review, December 2009*, available at http://www.windvigilance.com/awea_media.aspx.

[7] *See, e.g.,* Punch, Jerry, Richard James & Dan Pabst, 2010, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31 (attached to these comments as Exhibit 1); *see also* Nissenbaum, Michael A., March 2009, *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association (attached to these comments as Exhibit 2).

[8] Chouard, Claude-Henri, 2006, *Rapport: Le Retentissement du Fonctionnement des Éoliennes sur la Santé de l'Homme*

> The harmful effects of sound related to wind turbines are insufficiently assessed . . . . The sounds emitted by the blades being low frequency, which therefore travel easily and vary according to the wind, . . . constitute a permanent risk for the people exposed to them. . . . The Academy recommends halting wind turbine construction closer than 1.5 km from residences.[9]

In addition to the scientific evidence of health impacts from wind turbine noise, there is anecdotal evidence from residents of rural San Diego County that wind turbine noise impacts are significant. The Boulevard Planning Group's comments on the earlier solar and wind energy ordinance amendments, proposed in March 2010, state that in "Boulevard, off-reservation residents within several miles of the existing Kumeyaay Wind project complain of frequent noise and vibration impacts." Boulevard Planning Group's March 11, 2010 Comment Letter re: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006) ("BPG Comments") (attached as Exhibit 3), p. 13. Another Boulevard resident was quoted in a KPBS news story as confirming that "[t]here is a noise problem and also there's a – what's called wind turbine syndrome. . . . You can hear noise 24 hours a day. It sounds like a large truck on the freeway that never goes away; it's just constant."[10]

In sum, there is substantial evidence that the Amendments would have potentially significant secondary noise impacts via the wind projects approved under its auspices. These impacts must be fully analyzed in the PEIR. And to reduce some of these impacts, Conservation Groups recommend (1) that the setback standard be increased, and (2) that noise level measurements be taken at the nearest property line, rather than the nearest residence.

D. Climate Change Impacts

While the County's IS concludes that the Amendments would have a less than significant impact on climate change (IS, pp. 30-33), the IS fails to even mention several signficant sources of greenhouse gas emissions to which the Amendments will contribute. These sources must be fully analyzed in the PEIR.

First, there are fugitive emissions of SF6 – a potent greenhouse gas with a global warming potential of 23,900. These would result from the operation of the transmission line equipment used for the projects that would likely be approved under the Amendments, as well as any associated substations. These SF6 emissions would pose cumulatively significant impacts when combined with the emissions of the substantial existing and planned transmission-related infrastructure in and around San Diego County.

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[9] *Id*.

[10] http://www.kpbs.org/news/2010/jan/27/community-opposition-proposed-energy-projects/

Additionally, recent studies show that undisturbed alkaline desert areas, such as the Mojave Desert, eastern San Diego County and western Imperial County, sequester carbon-dioxide in surprising quantities.[11] Any large-scale wind projects approved under the Amendments would disturb and open up vast stretches of currently untrammeled desert lands to large-scale industrial development. These huge desert areas may do more good in reversing global warming if left alone than if they are fully developed into renewable energy generation facilities. This is particularly true where, as here, distributed photovoltaic energy production sited near the energy demand centers could eliminate or substantially reduce the need for the remote projects approved under the Amendments. A complete analysis of this indirect adverse impact of the Amendments, as well as the project-level and cumulative SF6 emissions impacts, must be conducted prior to the County's approval of the Amendments.

E. Wildfire and Emergency Response

Projects approved under the Amendments would likely increase fire risk and impede emergency response to a significant degree. And as such, these impacts must be fully analyzed in the PEIR. The magnitude of such risks is illustrated by the fire history in San Diego County. For example, San Diego Gas & Electric ("SDG&E") recently sought permission from the California Public Utilities Commission to turn off electrical power in the area of the ECO and Boulevard substations when fire dangers are high, a drastic measure from any perspective. If existing lines are so dangerous that SDG&E wants to shut off the power to thousands of people on windy days (potentially causing school shutdowns, disrupting emergency alert systems, and disabling hospital operations), the construction of even *more* energy projects, including any necessary substations and transmission lines, is very likely to have a significant impact on fire danger.

Furthermore, not only would the projects approved under the Amendments present fire hazards as new ignition sources, they would impede firefighters' efforts to combat wildfires. For example, any projects approved under the Amendments would require transmission and/or distribution lines that would create a substantial hazard for low-flying spotter and bomber aircraft that apply aerial retardant or water. It would be impossible to see those power lines in smoke filled canyons, and either pilots would be forced to risk their lives by flying when the lines are not clearly visible or aerial fire suppression would be stymied. Furthermore, in some cases the project-related transmission lines would need to be de-energized before firefighters could enter certain areas, giving the fire more time to spread.

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[11] Stone, Richard, "Ecosystems: Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle," *Science*, vol. 320 (5882), June 13, 2008, *available at*: http://www.ecostudies.org/press/Schlesinger_Science_13_June_2008.pdf (attached to these comments as Exhibit 4).

Clearly, the fire dangers presented by the Amendments and the projects that would be approved under them are significant and must be subjected to a full and accurate analysis in the PEIR.

F. Water Supply Impacts

Compounding the fundamental problems caused by geographical, seasonal, and interannual disjunctions, California's water supplies have become increasingly strained by continued population increases, global warming's significant impairment of the state's ability to capture and store mountain runoff, and reduced allocations from the major water sources including the Colorado River and State Water Project. As a result, it is essential that land use planning and development in the state be conducted in conjunction with water supply planning, and that developments be disallowed where sufficiently certain water sources are not available to serve them.

Indeed, as the California Supreme Court has recognized, CEQA imposes such a duty. In *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* 40 Cal.4th 412, 431 (2007), the Court articulated four main principles related to analysis of water supplies: (1) EIRs "cannot simply ignore[] or assume[] a solution to the problem of supplying water to a proposed land use project;" (2) water supply analyses for large multi-phase projects cannot be limited to the first phase or first few years of development; (3) the water supplies relied on in an EIR must have a likelihood of actually becoming available – "speculative sources and unrealistic allocations ('paper water') are insufficient bases for decisionmaking under CEQA;" and (4) when, despite a full discussion, uncertainty remains regarding future water supplies, CEQA requires that the EIR acknowledge the uncertainty and discuss reasonably foreseeable replacement sources or alternatives.

In light of the constraints on the state's water supply and the *Vineyard* decision, it is surprising that the County's Initial Study barely discusses water supply at all. In total, the IS devotes less than a page to the issue, and even then only to groundwater supplies. While the County concludes that "[m]ost wind energy systems are not expected to use any groundwater for any purpose," its contention contradicts common wind energy production practices. Initial Study, p. 43. According to the American Wind Energy Association, a 1.5 MW turbine operating at a 100% capacity factor for a full year would require 13,140 gallons of water per year, meaning a 100-turbine wind farm could use upwards of *1,314,000 gallons per year*, which is nearly 4 acre-feet per year. *See* BPG Comments, p. 12. In such an arid area, this quantity of water use is quite substantial and would likely have significant water supply impacts, whether on local aquifers or distant surface water sources. Thus, in contrast to the County's conclusion in the IS that the water supply impact would be less than significant, the Amendments' water supply

impact is likely to be quite significant. As such, the County must fully analyze the Amendments' secondary water supply impacts in the PEIR.

V. THE LANGUAGE OF THE ORDINANCE AND THE PROPOSED AMENDMENTS THERETO SHOULD BE CLARIFIED AND THEIR PROVISIONS SHOULD BE IMPROVED

Before preparing the PEIR on the Amendments, the County should clarify the language of the Ordinance and the Amendments and improve some of their provisions. First, as to clarifications, the County should amend the Ordinance's stating that large wind turbine systems may be located on parcels of "at least five acres." Given the required setbacks for large wind systems, a 5 acre parcel would not even support one large wind turbine.

Second, there are many improvements that the County should make to the Amendments. As discussed, the County should increase the required setbacks for wind energy projects. In addition, it should take noise level measurements from the nearest property line instead of the nearest residence. Further, the County should create and add to the Ordinance a minimum required buffer between any proposed wind turbine and a golden eagle's nest of at least six miles, per FWS' aforementioned guidance.

Most importantly, however, the County should emphasize distributed generation over wind projects that produce energy for offsite use. The County should adopt a policy that ranks renewable energy projects in a manner that gives preference to or otherwise incentivizes distributed generation projects in urbanized areas that have substantial existing infrastructure to be served by the locally produced electricity. Large-scale energy projects intended to produce electricity for offsite use should be discouraged, particularly in areas of ecologically or otherwise valuable open space or agricultural areas.

Not only would distributed generation have fewer environmental, health, safety, public utilities and other impacts, it is eminently feasible, arguably cheaper and has the potential to produce significant amounts of energy. For example, the California Energy Commission has determined that there are up to 60,929 MW of potential rooftop, photovoltaic, distributed generation in the state, not including commercial parking lots.[12] In San Diego County alone there are an estimated 2,600 MW of potential photovoltaic capacity on existing structures and already disturbed lands.
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[12] Public Interest Energy Research Program, California Energy Commission, *Distributed Renewable Energy Assessment: Final Report*, August 11, 2009, pp. 10 and 43.

VI. CONCLUSION

Conservation Groups commend San Diego County for deciding to prepare a full PEIR on the Amendments. Nonetheless, the preparation of an EIR in and of itself will not be enough to satisfy CEQA's requirements and ensure that the Wind Energy Ordinance is as environmentally beneficial as possible. The County must fully analyze the slew of significant impacts the Amendments would likely have, including those discussed in these scoping comments. And as part of its analysis, the County must account for the substantial number of other existing and proposed energy projects whose impacts are likely to combine with those of the projects approved under the Amendments to create cumulatively significant impacts. Furthermore, there are clarifications and improvements the County should make to the Amendments before preparing the PEIR, to both reduce the Amendments' environmental impacts and make the amended Ordinance more comprehensible.

Thank you for considering our comments on this important matter.

Respectfully submitted,

/s/ Stephan C. Volker

Stephan C. Volker
Attorney for Backcountry Against Dumps,
The Protect Our Communities Foundation, and
East County Community Action Coalition

SCV:taf

LIST OF EXHIBITS

1. Punch, Jerry, Richard James & Dan Pabst, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31.

2. Nissenbaum, Michael A., *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association, March 2009.

3. Boulevard Planning Group, Comment Letter re: Solar Wind Energy Zoning Ordinance Amendment (POD 09-006), March 11, 2010.

4. Stone, Richard, "Ecosystems: Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle," *Science*, vol. 320 (5882), June 13, 2008.

5. United States Fish and Wildlife Service, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, September 20, 2010.

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November 24, 2010

VIA EMAIL AND U.S. MAIL

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Re: Backcountry Against Dumps, the Protect Our Communities Foundation and East County Community Action Coalition's Comments on San Diego County's Proposed Changes to the Wind Energy Ordinance amendments (POD 10-007) and the EIR Process Thereon

I. INTRODUCTION

These comments are submitted on behalf of Backcountry Against Dumps ("BAD"), the Protect Our Communities Foundation ("POC") and East County Community Action Coalition ("ECCAC") (collectively "Conservation Groups") in response to San Diego County's ("the County's") proposed changes to the Wind Energy Ordinance amendments, POD 10-007 ("Amendments" or the "Project") and the Programmatic Environmental Impact Report ("PEIR") thereon.

Conservation Groups have been informed that the County intends to make two major changes to the Amendments and the California Environmental Quality Act ("CEQA"), Pub. Res. Code section 21000 *et seq.*, review process thereon:

(1) Bifurcate the environmental review process for the Amendments by conducting a full programmatic EIR only for the amendments related to large wind turbines, and preparing a negative declaration for the amendments related to small wind turbines;

(2) Reduce the maximum height of small wind turbines from 100 feet, as currently

proposed, to 80 feet, which is still 20 feet higher than allowed under section 6156(z) of the ordinance now in effect.

As discussed in detail in these comments, Conservation Groups prefer – and CEQA requires – that both the large and small wind turbine amendments be analyzed in the PEIR. Further, merely preparing a negative declaration for the amendments related to small wind systems would be inadequate in any case. Conservation Groups also recommend that the County reduce the maximum height for small wind turbines even further, to 65 feet or less, which would significantly reduce environmental impacts and comport with the height of most existing small wind turbines in the area.

Additionally, Conservation Groups take this opportunity to (1) comment on the County's compliance with AB 45, (2) urge the County to analyze in the PEIR the likely increase in meteorological towers ("MET towers") due to the Amendments, and (3) reiterate and add to their prior suggestions that before the County prepares the PEIR, it should further revise the draft Amendments to clarify and/or improve several of their provisions.

II. CONSERVATION GROUPS ARE VITALLY CONCERNED

All three Conservation Groups are directly impacted by the County's proposed Amendments. BAD is a community organization comprising numerous individuals and families residing in San Diego and Imperial counties. Members of BAD are directly affected by the County's land use planning and are keenly interested in the proper management of lands within the County in order to maintain and enhance their ecological integrity, scenic beauty, wildlife, recreational amenities, cultural resources, watershed values, and groundwater resources. Some members of BAD rely for their entire domestic, municipal, and agricultural water supply on the vulnerable aquifers of eastern San Diego County that are threatened with contamination and overdrafting by ongoing and proposed land use development. The Amendments present the potential for energy development that could harm the East County's natural resources, and BAD's members.

ECCAC is a coalition of community groups with the common goal of preserving their rural quality of life and the natural resources of eastern San Diego County. ECCAC and its members seek to maintain the ecological integrity, scenic beauty, wildlife, cultural resources, recreational amenities, watershed values, and groundwater resources in eastern San Diego County. ECCAC's members use County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments pose the potential to harm the use and enjoyment of these public resources by ECCAC's members as well as the public at large.

POC is a community organization composed of numerous individuals and families residing throughout eastern San Diego County who would be directly affected by projects that might be approved under the Ordinance as amended. POC's purpose is the promotion of a safe, reliable, economical, renewable and environmentally responsible energy future. POC's members use

County lands for aesthetic, scientific, historic, cultural, recreational, and spiritual enjoyment. The Amendments and the consequent development of energy development projects and infrastructure it might allow threaten the use and enjoyment of these East County public resources by POC's members.

Accordingly, Conservation Groups respectfully request your careful attention to their comments which follow.

III. THE COUNTY SHOULD NOT BIFURCATE ITS CEQA REVIEW OF THE AMENDMENTS

Conservation Groups note that large wind turbines likely have a greater potential than small wind turbines to cause significant environmental impacts. Thus, the County's current proposal to address large wind turbines in the PEIR is an improvement over its initial proposal, as described in the September 9, 2010 Notice of Preparation Documentation for the PEIR, to only analyze the impacts of small wind turbines. Nonetheless, it is essential – and required by law – that the County address *both* large and small wind energy system projects in the PEIR.

CEQA prohibits agencies from "piecemealing" projects by splitting them into two or more segments and analyzing each in a separate CEQA document. The purpose of this requirement is to ensure "that environmental considerations not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences." *Burbank-Glendale-Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592. Thus, in *Arviv Enterprises, Inc. v. South Valley Area Planning Commission* (2002) 101 Cal.App.4th 1333, the court held that a local agency properly required a developer of a 21-unit housing development to evaluate the impacts of the entire project even though it required submission of numerous separate building permit applications. The court's rational was that the potentially substantial impacts of the overall project "may be disguised or minimized by filing numerous, serial applications." *Id.* at 1346.

Here, the Amendments should be addressed as a single project in the same EIR. Just as in *Arviv Enterprises, Inc., supra*, 101 Cal.App.4th at 1346, while the amendments relating respectively to small and large wind energy systems could be done separately, their combined impacts are likely to be "disguised or minimized" if they are not reviewed in the same CEQA document. By describing and analyzing only the large wind energy system amendments in a full EIR, the compounding visual, noise, biological and other impacts of the small wind system amendments and the cumulative impacts of both large and small systems would be improperly trivialized or ignored altogether.

Furthermore, even if the County were to proceed with its proposed bifurcated review, it would not save either time or money since the PEIR must in any event address the cumulative impacts of the large wind energy system amendments. *See* 14 Cal. Code Regs. ("CEQA Guidelines") § 15130(a) (EIRs must "discuss cumulative impacts of a project when the project's

incremental effect is cumulatively considerable"). Thus, the County would be required to discuss the small wind energy system amendments and their impacts *anyway*.

Lastly, merely preparing a negative declaration for the amendments related to small wind systems would be inadequate in any case. As elucidated in Conservation Groups' March 26, 2010 letter on the County's draft negative declaration for the San Diego County Solar and Wind Energy Zoning Ordinance Amendment (attached to these comments as Exhibit 1), there is more than a "fair argument" that the small wind energy system amendments would have a significant environmental impact, most notably by substantially increasing the maximum allowable height of small wind turbines and substantially reducing their required setbacks. Among other things, the reduced setback would cause a significant increase in noise pollution and associated health risks. While small wind projects may be quieter, have fewer vibrational impacts and would thus require a smaller setback than larger projects, other smaller turbines can be very noisy due to faster blade rotational speeds. Thus, it is likely that small wind projects approved under the Amendments would have significant noise impacts on nearby residents, property owners and wildlife, such as the health impacts described in recent studies.[1]

IV. THE COUNTY SHOULD FURTHER REDUCE THE MAXIMUM ALLOWABLE HEIGHT FOR SMALL WIND TURBINES

Conservation Groups support the County's proposed reduction in maximum allowable height for small wind turbines from 100 feet to 80 feet, but urge the County to reduce the height limits further. Under section 6156(z) of the County's presently effective zoning ordinance, the maximum allowable height for small wind turbines is 60 feet. It is unclear why the County wishes to increase this height limit, especially given that many wind turbines substantially under 60 feet in height are already successfully operating in San Diego County. For example, many property owners have successfully installed 30-foot high Windspire turbines in the area.[2] In addition, Helix Wind has a test site in Boulevard for an array of 35-foot high wind turbines.[3] The viability and durability of these small turbines is illustrated by the fact that they were essentially undamaged by the severe storm in 2009 that wreaked havoc on the much larger turbines of the

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[1] *See, e.g.,* Punch, Jerry, Richard James & Dan Pabst, 2010, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31 (attached to these comments as Exhibit 2); *see also* Nissenbaum, Michael A., March 2009, *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association (attached to these comments as Exhibit 3). For a general primer on the health impacts of industrial wind turbines, *see* Society for Wind Vigilance, March 2010, *A Primer on Adverse Health Effects and Industrial Wind Turbines* (attached to these comments as Exhibit 4).

[2] For more information on Windspire Energy's turbines, go to http://windspireenergy.com/.

[3] For more information on Helix Wind's small wind turbine designs, go to http://www.helixwind.com/en/whyHelixWorks.php.

Kumeyaay Wind Power Project. Therefore, Conservation Groups recommend that the County reduce the maximum allowable height for small wind turbines to 65 feet at most.

V. THE COUNTY MAY IMPOSE GREATER RESTRICTIONS THAN THOSE SET FORTH IN AB 45

The County has stated that one of the main impetuses for the Amendments is to comply with AB 45, passed in 2009. AB 45 enables small-scale wind energy development throughout the state. However, it imposes limits on the restrictions that local governments can place on wind energy systems, which Conservation Groups believe are not appropriate in many cases. Nonetheless, because the County has had a wind energy ordinance of the type contemplated in AB 45 since the 1980s, it is likely "exempt" from those limitations. Gov. Code § 65895(a). Therefore, the County should not weaken its noise, setback, height and other restrictions solely in an attempt to comply with AB 45.

VII. THE COUNTY SHOULD ANALYZE IN THE PEIR THE LIKELY INCREASE IN MET TOWERS

MET towers are rarely used for the purely benign purpose of collecting weather data for research or public disclosure. More frequently, they are used to assess the viability of an area for wind (or sometimes solar) energy production and thus constitute precursors to the development of wind energy facilities. Given this fact, and the likelihood that the Amendments will spur new wind energy projects, there will likely be a concomitant rise in the number of MET towers proposed. Because this increase in MET towers is reasonably foreseeable and would "result in part from the project analyzed in the EIR," i.e. the Amendments, the PEIR "should . . . discuss [its] impacts." CEQA Guidelines § 15130(a)(1).

VII. THE LANGUAGE OF THE ORDINANCE AND THE PROPOSED AMENDMENTS THERETO SHOULD BE CLARIFIED AND THEIR PROVISIONS SHOULD BE IMPROVED

Before preparing the PEIR on the Amendments, the County should clarify the language of the Ordinance and the Amendments and improve some of their provisions. First, as to clarifications, the County should amend the Ordinance's language that large wind turbine systems may be located on parcels of "at least five acres." Given the required setbacks for large wind systems, a five-acre parcel would not even support one large wind turbine.

Second, there are many improvements that the County should make to the Amendments. For one, the County should increase the required setbacks for wind energy projects in accordance with the recent research on the health impacts of wind turbine noise. With respect to larger wind turbines, the research suggests that they should be set back by more than one mile. Based on her peer-reviewed research on the impacts of wind turbine noise, Dr. Nina Pierpont recommends

setbacks from large wind projects of at least *1.25 miles* to avoid negative health impacts.[4] A similar setback has been called for by the French National Academy of Medicine.[5] In his report for the Academy, Claude-Henri Chouard writes:

> The harmful effects of sound related to wind turbines are insufficiently assessed .... The sounds emitted by the blades being low frequency, which therefore travel easily and vary according to the wind, ... constitute a permanent risk for the people exposed to them. ... The Academy recommends halting wind turbine construction closer than 1.5 km from residences.[6]

In addition to increasing the setbacks for wind turbines, the County should take noise level measurements from the nearest property line instead of the nearest residence. Furthermore, in line with the United States Fish and Wildlife Service's recent recommendations for wind energy projects, the County should add an additional amendment to the Ordinance requiring a minimum six-mile buffer between any proposed wind turbine and a golden eagle nest.[7]

Aside from the wind turbines themselves, the County should also further amend the Ordinance to require MET tower applicants to obtain full use permits, under section 7350 *et seq.* of the zoning ordinance, rather than just the administrative permit now required by section 6123. This would help ensure that (1) the MET towers and the wind energy projects they generally precede are not hastily constructed, (2) the County is informed at an early stage of any plans for wind system development, and (3) neighbors and other affected persons are given a fuller chance to comment on and participate in wind system planning and approval process. Further, there is precedent for requiring use permits for MET towers, as they were mandated by the zoning ordinance until February 25, 2009. Such a requirement is also imposed by the current zoning ordinance for large wind systems, which have many similar impacts as MET towers given their comparable heights, and would continue to be required under the Amendments.

However, the most important improvement the County should make to the Ordinance is to emphasize distributed generation located within energy demand centers over remote industrial-

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[4] Pierpont, Nina, 2009, *Wind Turbine Syndrome: A Report on a Natural Experiment*, K-Selected Books: Santa Fé, NM.

[5] Chouard, Claude-Henri, 2006, *Rapport: Le Retentissement du Fonctionnement des Éoliennes sur la Santé de l'Homme*

[6] *Id.*

[7] United States Fish and Wildlife Service, September 20, 2010, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, Oregon, p. 3 (attached to these comments as Exhibit 5).

sized wind projects that produce energy for offsite use. The County should adopt a policy that ranks renewable energy projects in a manner that gives preference to or otherwise incentivizes distributed generation projects in urbanized areas that have substantial existing infrastructure to be served by the locally produced electricity. Large-scale energy projects intended to produce electricity for offsite use should be discouraged, particularly in areas of ecologically, scenically or otherwise valuable open space or agricultural use.

Not only would distributed generation have fewer environmental, health, safety, public utilities and other impacts, it is eminently feasible, arguably cheaper and has the potential to produce significant amounts of energy. For example, the California Energy Commission has determined that there are up to 60,929 MW of potential rooftop, photovoltaic, distributed generation in the state, not including commercial parking lots.[8] In San Diego County alone there are an estimated 2,600 MW of potential photovoltaic capacity on existing structures and already disturbed lands.

VII. CONCLUSION

Conservation Groups appreciate being informed of the County's proposed changes to the Amendments and the CEQA process thereon. Conservation Groups respectfully request your careful attention to their comments.

Thank you for considering our comments on this important matter.

Respectfully submitted,

Stephan C. Volker
Attorney for Backcountry Against Dumps,
Protect Our Communities Foundation, and
East County Community Action Coalition

SCV:taf

[8] Public Interest Energy Research Program, California Energy Commission, *Distributed Renewable Energy Assessment: Final Report*, August 11, 2009, pp. 10 and 43.

LIST OF EXHIBITS

1. BAD, POC and ECCAC, Comment Letter re: San Diego County Solar and Wind Energy Ordinance Amendment and Draft Negative Declaration thereon, State Clearinghouse No. 2010021070, March 26, 2010.

2. Punch, Jerry, Richard James & Dan Pabst, "Wind-Turbine Noise: What Audiologists Should Know," *Audiology Today*, July/August 2010, pp. 20-31.

3. Nissenbaum, Michael A., *Mars Hill Wind Turbine Project Health Effects: Preliminary Findings*, presentation to the Maine Medical Association, March 2009.

4. Society for Wind Vigilance, *A Primer on Adverse Health Effects and Industrial Wind Turbines*, March 2010.

5. United States Fish and Wildlife Service, Letter to the Oregon Department of Energy re: Request for Comments on the Application for Site Certificate for the proposed Summit Ridge Wind Project, Wasco County, September 20, 2010.

WIND ENERGY ORDINANCE
POD 10-007

NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT
PUBLIC REVIEW PERIOD
September 9, 2010 through October 11, 2010

PUBLIC SCOPING MEETING COMMENT SHEET

Tuesday, September 21, 2010
Department of Planning and Land Use Hearing Room
5201 Ruffin Road, Suite B
San Diego, CA 92123

WRITTEN COMMENT FORM

Please see the attached letter dated October 15th 2010.

(Attach additional pages as needed)

[signature] 10/15/10
Signature Date

Jennifer R. Purczynski
Print Name

7777 Fay Ave., Ste. 200
Address

La Jolla, CA 92037
City State Zip Code

MAIL, FAX or E-MAIL FORMS TO:

Matt Schneider
County of San Diego
Department of Planning and Land Use
5201 Ruffin Road, Suite B
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COMMENTS MUST BE RECEIVED BY 4:00 PM, October 11, 2010

Green Power

Padoma Wind Power, LLC
A subsidiary of Enel North America, Inc
7777 Fay Ave, Suite 200, La Jolla CA 92037
Tel: 858-731-5001 Fax: 858-731-5049

October 15, 2010

Mr. Matt Schneider
Land Use/Environmental Planner III
County of San Diego Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123
MS O-650

Re: Scoping Comments on Wind Energy Ordinance (POD 10-007)

Dear Mr. Schneider:

Thank you very much for the opportunity to comment on the scope of San Diego County's proposed Wind Energy Ordinance, POD 10-007. As you know, tapping into sources of renewable energy is critical for a number of reasons. Not only will clean power improve quality of life by reducing air pollution and creating green jobs, it will help meet the State of California's aggressive RPS goals and targets for cutting greenhouse gas emissions. We applaud the County's commitment to achieving these goals by updating and streamlining requirements for small and large wind energy systems. This effort represents a positive step toward cleaner energy and a sustainable future.

We are pleased to submit the following comments on the scope of the new ordinance and the environmental document. Our company, Enel Green Power, is proposing a wind and solar energy facility in the unincorporated community of Boulevard. We plan to submit an application to install MET facilities at the site later this month and eventually may pursue a Major Use Permit (MUP) through the County. As such, our comments are primarily focused on establishing reasonable guidelines for utility-scale wind projects, rather than systems smaller than 50 kilowatts (KW).

Enel Green Power (EGP) is a subsidiary of Enel, Italy's largest power company and a worldwide leader in renewable energy production. EGP operates in 16 countries and has an installed capacity of more than 5,700 megawatts (MW) – enough to cover the energy consumption of 7.8 million families. Approximately 800 MW of that electricity is located in North America. EGP is currently operating and developing hydro, wind, geothermal and biomass facilities in 20 U.S. states and three Canadian provinces.

In early 2010, EGP purchased San Diego-based Padoma Wind Power. Our team has expertise in developing, operating and owning wind farms. We have worked on more than 45 projects worldwide and installed roughly 1,300 MW of wind in the U.S. This extensive experience has provided us with a strong knowledge of industry standards and best practices on which we have based our scoping comments.

I. Evaluate large wind energy systems during the MUP approval process

Because utility-scale wind projects will be fully analyzed in individual Environmental Impact Reports (EIR) during the MUP approval process, which includes extensive county and public input, we believe it is unnecessary to establish height limits, minimum setbacks or other baseline criteria in the Wind Energy Ordinance. Assessing proposals on a case-by-case basis will provide wind developers with flexibility to respond to advances in technology. Placing limitations on large wind energy projects in the ordinance could hinder future renewable energy development.

II. Establish setbacks on a case-by-case basis during the MUP approval process

Since the 1980s, wind turbines have grown considerably in size, capacity, efficiency and cost effectiveness. For example, wind turbines installed at Altamont Pass in Alameda County in the early 1980s had a rotor diameter of 17 meters and produced 100 KW of energy Today, turbines with rotors exceeding 100 meters in diameter are capable of generating 2.5 MW or more. Although it is unlikely that we will continue to see the same rate of growth in turbine size that we experienced during the last 20 years, it is possible that newer, more advanced designs, which may include taller towers and larger rotors, will continue to be available in the future.

Due to the technological advancements discussed above, establishing minimum setbacks based on turbine height is constraining and could hinder opportunities for project layout optimization to maximize efficiency. Wind energy projects could also be prevented from moving forward, which would be a direct conflict with one of the purposes of the new ordinance, which is to develop additional renewable resources to meet the state's RPS goals. We recommend the County not establish turbine heights in the Wind Energy Ordinance and instead evaluate projects on a case-by-case basis during the required CEQA and environmental review process.

Should the County establish minimum setbacks for large wind energy systems in the new ordinance, we recommend maintaining the provision that allows significant setback reductions with the written consent of surrounding property owners. Further, strong consideration should be given to eliminating setbacks from property lines if adjacent parcels are part of the same project.

III. Evaluate noise for large wind energy systems in individual project EIRs

Noise levels vary depending on site-specific conditions, such as topography and vegetation. Turbine models and the direction and magnitude of the winds also influence sound propagation. As a result, noise should be analyzed for individual projects based on the local winds and topography. Any maximum decibel levels established by the County should be analyzed using the existing CEQA guidelines.

IV. Turbine description in MUP application

Because wind turbine technology is constantly evolving, we believe the County should not require large wind energy system developers to include the turbine manufacturer, model, power rating and blade dimensions, or tower manufacturer in the MUP application. As you know, the environmental review and approval process can take several years. This requirement would prevent developers from utilizing the most up-to-date, efficient and cost-effective turbines at the time of construction. The new ordinance should allow applicants to provide a general description of the proposed turbines that includes ranges for height, blade dimensions and capacity. The exact model and manufacturer would be finalized prior to the certification of the Final EIR.

V. **Assess biological impacts in individual project EIRs**

Biological impacts depend largely on specific sites. Vegetation and animal species may vary from one location to the next. Analysis of these issues should fall under the purview of project EIRs during the MUP process, rather than the County's more comprehensive study. Biological impact assessments should follow the County's already established, CEQA-supported guidelines.

VI. **Maintain additional standards in current ordinance**

We support the County's current standards for fencing, signs, visual, non-operational wind turbines and removal surety. Therefore, we respectfully ask that your EIR analyze the guidelines found in the existing ordinance.

Thank you very much again for the opportunity to submit these comments on the Wind Energy Ordinance EIR. We sincerely appreciate your efforts to streamline the process for renewable energy projects in San Diego County. Should you need any assistance in the future, please don't hesitate to contact us.

Sincerely,

Jennifer Purczynski
Senior Manager, Project Development

The major classification the wind ordinance needs to be categorized is onsite versus offsite:

Offsite - Any offsite/exportation of renewable electricity should be considered an administrative permit and only subject to public and cursory environmental studies if deemed necessary. Some may argue that this is not enough, but due to the imminent need for our civilization to go to a renewable solution coupled with the rare and precious renewable resource that pockets of San Diego have, as the risk for impact locally will be made up for many-fold with the reduction of greenhouse gases, acid rain, global warming. Wind power risks do not have the ability to affect ecosystems and therefore the macro-effect should only be considered.

Onsite - If a renewable technology exists for a commercial/residential use that would enable it to be off the grid, then all barriers to execution should be lifted and a "by right" designation to be given. There is no way this solution could be abuse as they would need to show electrical analysis for the requirement of the end product. Stipulations can be instituted if necessary for the permit to be a bi-annual renewal where owners are required to provide actual metering reports to validate that all power required needed by facility is being produced and used onsite. This would be a better solution than any regulation that would put roadblocks in the way of supporting sustainable energy production.

Wind (Current 50kw limit) versus Solar (Currently unlimited):

The baseline payback period for solar is roughly 10 - 15 years, when the payback for wind is 4 - 6. This is because wind is more than twice as efficient as solar and half of the price. Therefore, wind (or any other renewable resource) needs to be treated equally like solar, if there is a wind resource, it is a waste not to use it.

Major facts and fallacies with regard to wind turbines over the last 20 years since the last regulations were developed:

* - Turbines move slower thus easier for birds/bats to navigate.
* - Turbines are quieter (equivalent to a refrigerator at the loudest)

Prodígeo Corp.
a consultancy & holding company

The variables that are important for consideration when drafting wind energy guidelines (in order of importance):

1. Output – Any onsite use needs to be unlimited and should not favor any particular technology. If there is a natural gas, water, wind, or solar resource on the property and the owner has the ability, (s)he should be encouraged so take any measure required to be sustainable and should not be prohibited/limited in doing so.
2. Height - So long as the GPS coordinates are gathers to inform FAA requirements, height should never be a restriction. If HAM radio towers are allowed, then certainly technology to reduce the carbon footprint.
3. Setbacks - Setbacks should not be required for non-residential structures. (Setbacks arguable should not be required for residential as well as if a structure falls, which rarely happens, the negligence is in the installation as the engineering is designed to withstand wind pressure.
4. Visual Impact - Wind Turbines have become the marquee technology for the Green Energy movement, to some they are majestic and others an industrial eye-sore.

Regardless, the bottom line is that wind energy is in the top tier of efficiency for renewable along with hydro and geothermal,