TrueWind Solutions

**Final Report**

TO: Michael Kane and Dora Yen
FROM: Bruce Bailey and Michael Brower
DATE: February 6, 2004
RE: Task 2 Final Focus Area Selection Report and Final List of Candidate Focus Area Sites
*Contract No. 500-03-006*

This transmittal constitutes two of the four deliverables for Task 2 (Selection of Focus Areas) of the Energy Commission project "Wind Energy Resource Modeling and Measurement." The first deliverable—Final Focus Area Selection Report—discusses the criteria and methods used for selecting focus areas, while the second deliverable—Final List of Candidate Focus Area Sites—identifies the location of the candidate areas.

Focus Area Selection

The selection objectives for the focus areas are laid out in the contract's scope of work:

- The areas should offer significant promise for wind energy development after considering important siting factors.
- Two areas should be within the major, known wind resource areas of the state.
- The remaining three areas should be relatively unexplored and offer the potential for new, large-scale project development.
- The focus areas should represent a variety of terrain in order to adequately test the wind modeling process. One focus area should contain a mountain pass.
- The focus areas should also investigate regions of particular interest to the Energy Commission. One of the areas should be in Northern California. Another should be in the Mojave Desert.

It is also desired that tall towers exist within or near the focus areas so that the meteorological measurements activities of Task 4 can be co-located.

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The selection of candidate focus areas was a four-step process:

1. A geographical information system (GIS) was used to screen the state for suitable development sites by selecting and applying several siting criteria having an important bearing on project feasibility and economics, including:
    - ◊ Wind resource as defined by the CA wind map developed by TrueWind for the Energy Commission
    - ◊ Elevation and air density
    - ◊ Proximity to transmission
    - ◊ Proximity to populated areas
    - ◊ Exclusion of park lands, wilderness areas and conservation areas
    - ◊ Exclusion of water bodies
    - ◊ Exclusion of steeply sloped terrain (>15%), which is generally not negotiable by heavy trucks carrying large turbine equipment components.

    Using a cost-based approach, proprietary algorithms developed by TrueWind were then applied to identify the most cost-effective sites able to support project sizes of at least 50 MW. This approach used capital and construction cost assumptions for wind plants and for roads and transmission lines (including substations), which accounted for distances from existing facilities. Wind plant capacity factors were calculated by matching wind map-derived resource statistics with a generic turbine power curve reflecting current megawatt-scale wind technologies.

2. Following a review of the GIS-based site screening exercise, 22 candidate focus areas were chosen to satisfy the established selection objectives. The candidate areas were then classified into nine categories based on landform type, geography, and experience with prior wind development:
    - ◊ A – Along California-Mexico border (2 areas)
    - ◊ B – Desert areas (6 areas)
    - ◊ C – Existing San Gorgonio wind farms (1 area)
    - ◊ D – Existing Tehachapi wind farms (4 areas)
    - ◊ E – Coastal mountain sites (3 areas)
    - ◊ F – Existing Altamont Pass wind farms (1 area)
    - ◊ G – Existing Solano County & Montezuma Hills wind farms (2 areas)
    - ◊ H – Interior ridgeline sites (2 areas)
    - ◊ I – Northern valley site (1 area)

    Only one area is to be selected from any one category. Some of the final focus areas sites may be a combination of multiple initial candidate focus area sites of the same category. Two areas are to represent existing project development areas (categories C, D, F & G).

3. A tall-tower search scheme was applied to the 22 candidate focus areas to determine which candidate focus areas met the requirements of the meteorological measurement activities of Task 4. This scheme utilized the FCC Antenna Structure Registration, the

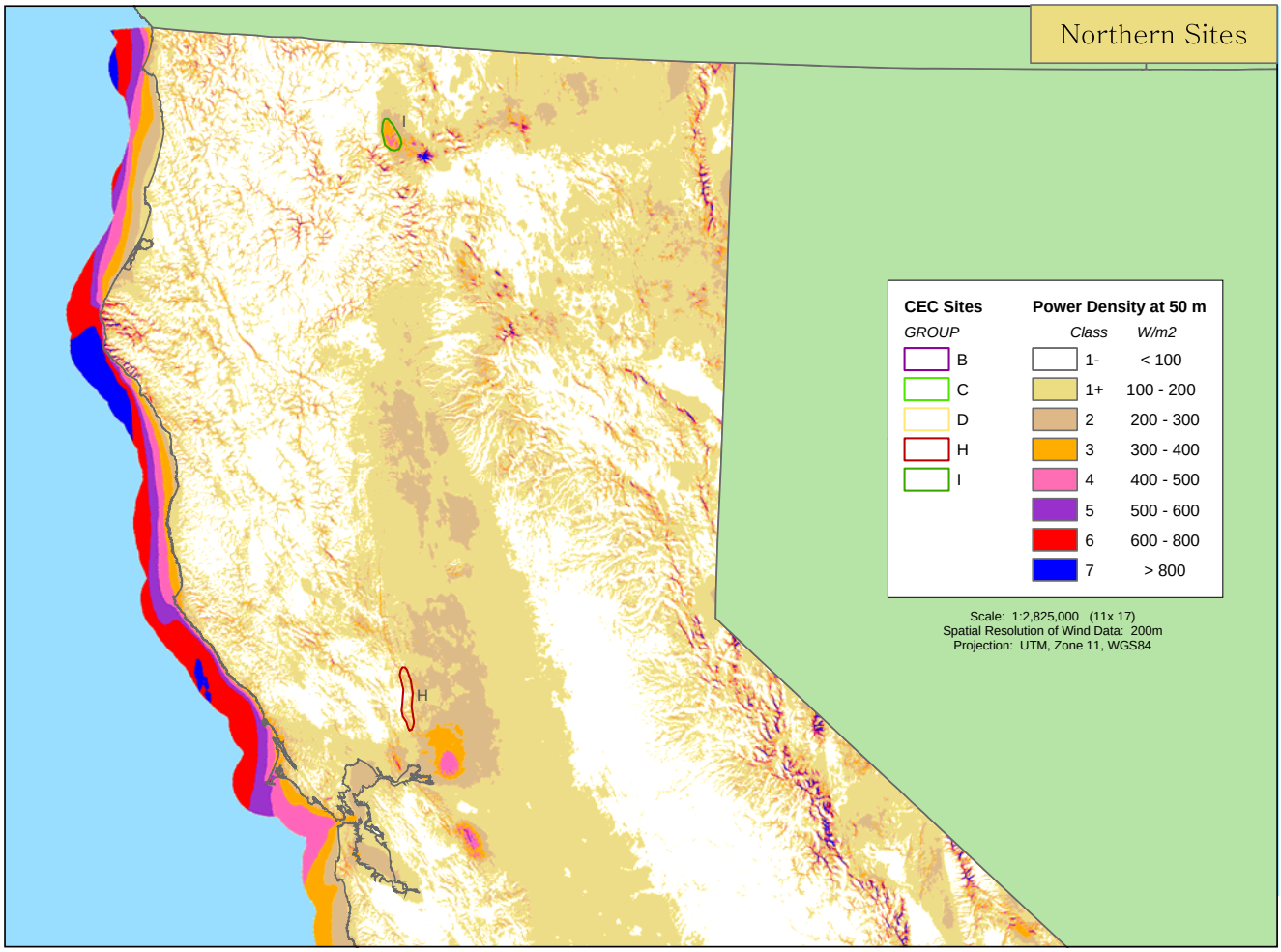
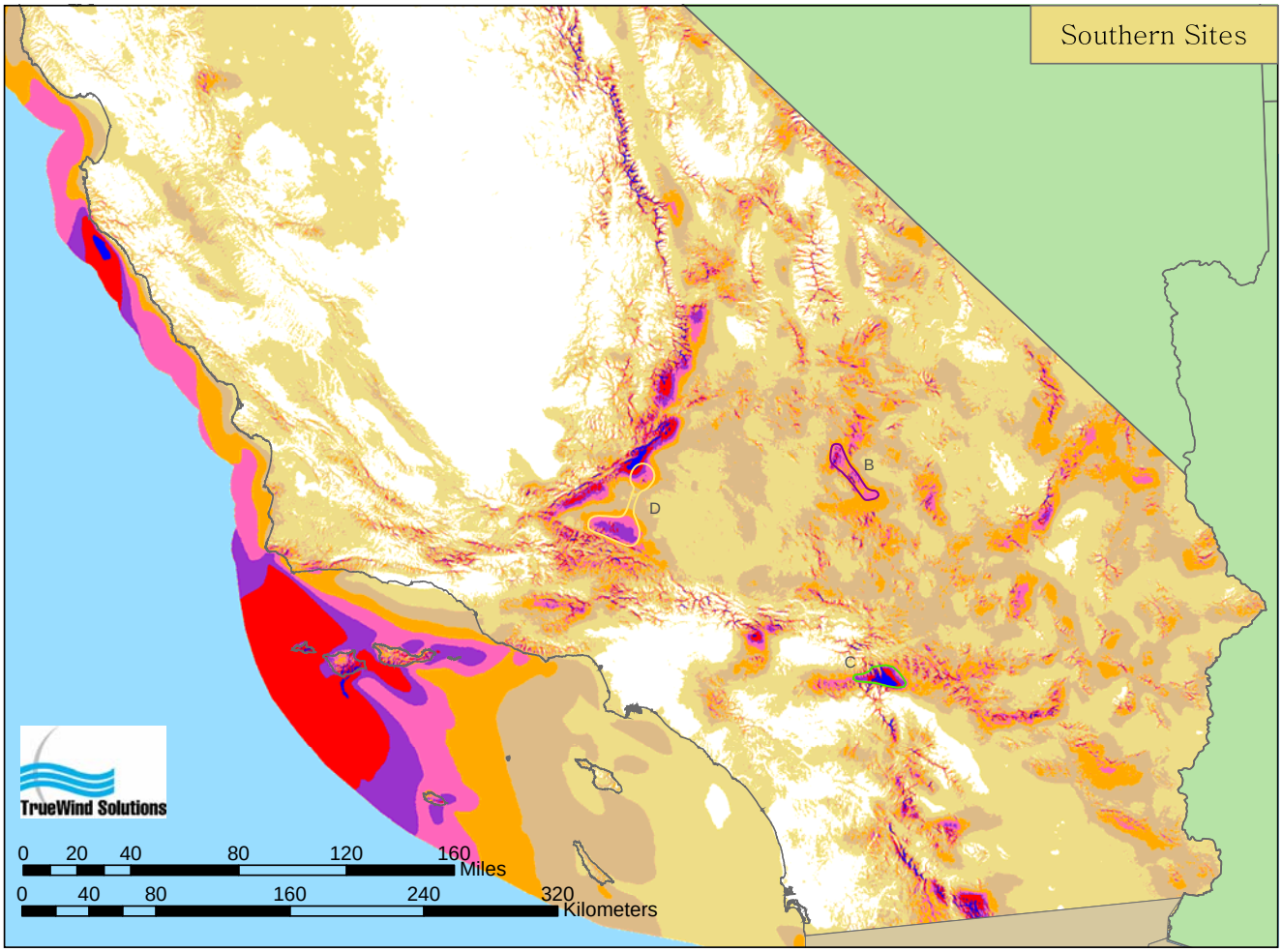
FAA Digital Obstacle File, site visits, as well as communications with tower owners and local contacts.

4. The results of the first three steps of the selection process were compiled and evaluated, resulting in the selection of the final candidate focus area sites.

Final List of Candidate Focus Areas

A separate Excel spreadsheet lists the final candidate focus area sites with their corresponding counties and centroid coordinates (lat/long and UTM). In addition, locations of the focus area sites were drawn on the base wind map of the state. Both the list and map (in .pdf format) were submitted separately from this report.

**Final List of Candidate Focus Area Sites for the Energy Commission "Wind Energy Resource Modeling and Measurement" Project**
TrueWind Solutions, LLC

| Site | Group | Description | County | Lon_Centroid | Lat_Centroid | X_Centroid | Y_Centroid |
|---|---|---|---|---|---|---|---|
| | | | | DD, WGS84 | | UTM Zone 11, WGS84 | |
| B | B | Desert areas | San Bernardino | -116.83155 | 35.03514 | 515379.00537 | 3876946.68771 |
| C | C | Surrounding existing San Gorgino wind farms | Riverside | -116.62582 | 33.93259 | 534583.13781 | 3754746.83486 |
| D | D | Surrounding existing Tehachapi wind farms | Los Angeles/Kern | -118.30435 | 34.81656 | 380687.99089 | 3853458.96654 |
| H | H | Ridge line sites | Sonoma/Lake/Napa | -122.66575 | 38.69379 | 7123.21269 | 4298058.61262 |
| I | I | Northern site | Siskiyou | -122.44268 | 41.51182 | 45739.71433 | 4609896.98477 |

# Map of Final Candidate Focus Areas