

Helix Wind Power Facility: Revegetation Plan
[JULY 31, 2009]

I. Introduction

This Revegetation Plan applies to the areas of construction disturbance surrounding the permanent facility components of the Helix Wind Power Facility.¹ The objective of revegetation is to restore the disturbed areas to pre-disturbance condition or better. The site certificate for the facility requires restoration of these areas. This plan has been developed in consultation with the Oregon Department of Fish and Wildlife (ODFW).

The areas of anticipated construction disturbance include cultivated or otherwise developed agricultural land (cropland) as well as areas of native grassland and minor amounts of shrub-steppe habitat and other habitat subtypes (collectively referred to as wildlife habitat areas). The intensity of construction impact will vary. In some areas, the impact will be relatively light, but in other areas, heavy construction activity will remove all vegetation, remove topsoil and compact the remaining subsoil. Where vegetation has been damaged or removed during construction, the certificate holder must restore suitable vegetation. In addition, the certificate holder shall maintain erosion and sediment control measures put in place during construction until the affected areas are restored as described in this plan and the risk of erosion has been eliminated. The plan specifies monitoring procedures to evaluate revegetation success of disturbed wildlife habitat areas. Remedial action may be necessary for wildlife habitat areas that do not show revegetation progress. Additional mitigation may be necessary if revegetation is unsuccessful.

II. Description of the Facility Site

The facility is located in Umatilla County, Oregon, on private agricultural land. Most of the land is used for dryland winter wheat cultivation and occasionally for livestock grazing. Soils are typically loess formations of well-drained, moderately permeable, fertile silt loams over basalt. The area receives approximately 13 inches of precipitation annually, most of which occurs between October 1 and March 31.

The site is within the Columbia Plateau physiographic province. The facility is located on an upland plateau at elevations ranging from approximately 970 feet to 1,890 feet. Most of the historic native vegetation in the project area has been modified by human activities. Approximately 51 percent of the site is in cropland. Small areas of native perennial bunchgrass are present and some of the previously farmed land has been re-established as grassland to meet the standards specified by the Conservation Reserve Program (CRP). Very little intact native shrub (sagebrush) habitat exists. Grasslands located on shallow soils and deep soils are the highest quality native perennial grasslands present on the site. The vegetation and habitat quality of the site are described in more detail in the Final Order on the Application for the Helix Wind Power Facility.

¹ This plan is incorporated by reference in the site certificate for the Helix Wind Power Facility and must be understood in that context. It is not a “stand-alone” document. This plan does not contain all mitigation required of the certificate holder.

Helix Wind Power Facility: Revegetation Plan
[JULY 31, 2009]

1 **III. Revegetation Methods**

2 The certificate holder shall begin restoration of disturbed areas as soon as possible after
3 completion of construction activity in the area to be restored. Restoration measures include soil
4 preparation and seeding as described below. Seeding should be done at the appropriate time of
5 year to facilitate seed germination and root establishment, based on weather conditions. The
6 certificate holder shall choose planting methods based on site-specific factors such as slope,
7 erosion potential, and the size of the area in need of revegetation as well as knowledge gained
8 from restoration efforts at other regional wind facilities in similar habitat and soils.

9 **1. Correction for Compaction**

10 In some areas within the site boundary, soils are generally too shallow and rocky to
11 become compacted by construction activities. Deeper soils may become compacted. The
12 certificate holder shall examine disturbed areas as soon as construction is finished in the area.
13 Areas that appear to be affected by compaction will be treated as soon as practicable by deep
14 tillage or ripping (scarification) using the method preferred by the landowner. In some areas,
15 compaction might not become evident until vegetation indicates the condition through poor seed
16 sprouting, stunting or plant death. Where that occurs, the area will be tilled or ripped and then re-
17 seeded, using the method preferred by the landowner.

18 **2. Revegetation of Cropland**

19 The certificate holder shall consult with the landowner and farm operator to determine
20 which fields should be planted in wheat or other crops and which should be left fallow. The
21 certificate holder shall consult with the landowner and farm operator to determine species
22 composition for planting, seed and fertilizer application rates and application methods. The
23 certificate holder may reimburse the landowner or farm operator for the work or hire contractors
24 to carry out the restoration activities on cropland.

25 **3. Revegetation of Wildlife Habitat Areas**

26 The certificate holder shall seed all disturbed grassland, shrub-steppe and other wildlife
27 habitat subtype areas that are not cropland or developed areas. The certificate holder shall
28 determine the appropriate seed mix and application rate through consultation with the landowner,
29 ODFW, the USDA Farm Service Agency (for CRP field restoration, if needed) and the Oregon
30 Department of Energy (Department). The seed mix should include a combination of grasses,
31 forbs and shrubs based on the characteristics of the affected area. The mix should contain native
32 species selected based on relative availability and compatibility with local growing conditions.
33 Seed mix selection should consider soil erosion potential, soil type, seed availability and the need
34 for using native or native-like species. The certificate holder shall use seed provided by a
35 reputable supplier and complying with the Oregon Seed Law.

36 After construction activities are completed, disturbed areas will be evaluated to determine
37 whether restoration seeding is needed. In some areas where existing vegetation has been crushed
38 but not removed during construction, recovery is likely to occur in a reasonable time without
39 intervention. Seeding will not be done in areas where the pre-construction condition was exposed
40 rock, bare soil or bare sand that is unlikely to support vegetation.

Helix Wind Power Facility: Revegetation Plan

[JULY 31, 2009]

1 Narrow areas of soil disturbance due to off-road trenching, off-road crane paths and other
2 limited disturbance may be seeded and left without mulch. Hand seeding, rather than mechanical
3 seeding, will be used in small areas where the use of planting equipment is likely to increase the
4 area of disturbance. Larger disturbed areas will be seeded followed by application of weed-free
5 straw or other mulch to protect against erosion and preserve moisture. No-till methods, such as
6 drilling or broadcast seeding, will be employed.

7 In the arid climate of the site, successful seeding is limited to mid-fall through very early
8 spring. If seeding of large disturbance areas cannot be accomplished within this optimal seeding
9 period within 2 months after construction disturbance, the areas will be mulched or otherwise
10 treated to minimize erosion until seeding can be done in the fall.

11 **4. Weed Control**

12 In the spring and early summer (approximately April through July), weeds commonly
13 found on the site can be identified before they seed. After construction, all disturbed areas
14 (except areas of exposed rock, bare soil, and bare sand) will be evaluated annually in the spring
15 for the presence of invasive weed species. The certificate holder shall implement weed control
16 measures recommended by weed control authorities. Annual weed inspection and treatment of
17 revegetation areas will be discontinued in areas that are determined to be successfully
18 revegetated, but the certificate holder shall continue to implement a weed control program during
19 facility operation as required by the site certificate.

20 **IV. Monitoring**

21 **1. Revegetation Record**

22 The certificate holder shall maintain a record of revegetation work for both cropland and
23 wildlife habitat areas. In the record, the certificate holder shall include the date that construction
24 activity was completed in the area to be restored, a description of the affected area (location,
25 acres affected and pre-disturbance condition), the date that revegetation work began and a
26 description of the work done within the affected area. The certificate holder shall update the
27 revegetation records from time to time, as revegetation work occurs. The certificate holder shall
28 provide copies of these records to the Department at the time of submitting the annual report
29 required under the site certificate.

30 **2. Monitoring Procedures**

31 (a) Cropland

32 During the first growing season following planting of cropland previously disturbed by
33 facility construction, the certificate holder shall consult with the landowner and farm operator on
34 soil compaction, construction-related erosion or poor crop growth in disturbed areas. The
35 certificate holder may rely on the judgment of the landowner and farm operator regarding any
36 corrective measures needed.

37 (b) Wildlife Habitat Areas

38 The certificate holder shall monitor the revegetation of wildlife habitat areas as described
39 in this section unless the landowner has converted the area to a use inconsistent with the success
40 criteria. The certificate holder shall employ a qualified investigator (an independent botanist or

Helix Wind Power Facility: Revegetation Plan

[JULY 31, 2009]

1 revegetation specialist) to examine all non-cropland revegetation areas to assess vegetation cover
2 (species, structural stage, etc.) and progress toward meeting the success criteria described below
3 in Subsection 3. Within representative sample plots, the investigator will estimate the
4 percentages of the area that are covered by bare soil, desirable native vegetation or invasive weed
5 species. The investigator will qualitatively assess the degree of erosion at each site. The
6 investigator will compare the sample plots with representative reference plots of the same habitat
7 category and subtype.

8 The investigator will survey at least 20 percent of the disturbed area. The investigator
9 will select sample plots that are representative of all habitat subtypes disturbed. Sample plots
10 must proportionally represent areas of light disturbance (crushed vegetation) and areas of heavier
11 disturbance (scraped or heavily compacted soil). Reference plots will be selected from nearby
12 undisturbed areas within the same habitat subtype and category. Reference plots should have
13 similar slopes, soil depth and prevalence of rock outcrops as the sample plots to which they will
14 be compared.

15 The investigator shall use the same reference and sample plots for every survey, unless
16 the investigator finds that a plot is no longer suitable for survey purposes. If the investigator
17 finds that a plot is no longer suitable, the investigator will select a suitable replacement plot and
18 report the reasons for the replacement to the certificate holder, the Department and ODFW.

19 Revegetation monitoring surveys will be conducted annually beginning one year after
20 initial restoration seeding and continuing until there is sufficient evidence of progress for the
21 Department to conclude that additional revegetation efforts in the area are not necessary.
22 Thereafter, the restored areas will be surveyed at 5-year intervals for the life of the facility.²

23 The investigator will report to the certificate holder, the Department and ODFW
24 following each inspection. In the report, the investigator shall include an assessment of whether
25 the revegetated areas are trending toward meeting the success criteria. The investigator will
26 include in the report any remedial actions recommended. The investigator shall also report on the
27 success of weed control measures.

28 Within each revegetation area, the investigator shall evaluate the progress of habitat
29 recovery in comparison to the reference area and document the progress with photos. The
30 investigator shall evaluate the following site conditions (both within the revegetation area and
31 within the reference area):

- 32 • Degree of erosion due to disturbance activities (high, moderate, or low).
- 33 • Vegetation density.
- 34 • Relative proportion of desirable vegetation as determined by the average number
35 of stems of desirable vegetation per square foot or by a visual scan of the area,
36 noting overall recovery status.
- 37 • Species diversity of desirable vegetation.

² As used in this plan, “life of the facility” means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

Helix Wind Power Facility: Revegetation Plan
[JULY 31, 2009]

1 **3. Success Criteria**

2 (a) Cropland

3 Cropland areas are successfully revegetated when the replanted areas achieve crop
4 production comparable to adjacent non-disturbed cultivated areas. The certificate holder shall
5 consult with the landowner or farmer to determine whether these areas have been successfully
6 revegetated.

7 (b) Wildlife Habitat Areas

8 A wildlife habitat area is successfully revegetated when its habitat quality is equal to or
9 better than the habitat quality of the reference area as measured by the site conditions listed
10 above in Subsection 2. When the Department finds that the condition of a revegetated wildlife
11 habitat area satisfies the criteria for revegetation success, the Department will conclude that the
12 certificate holder has met its restoration obligations for that area. If the Department finds that the
13 landowner has converted a wildlife habitat area to a use that is inconsistent with the success
14 criteria, the Department may conclude that the certificate holder has no further obligation to
15 restore the area for wildlife habitat uses.

16 **4. Remedial Action in Wildlife Habitat Areas**

17 After each monitoring visit, the certificate holder's qualified investigator shall report to
18 the certificate holder regarding the revegetation progress of each wildlife habitat area. The
19 investigator shall make recommendations to the certificate holder for reseeded or other remedial
20 measures for areas that are not showing progress toward achieving revegetation success.

21 Indications that an area is not showing progress toward achieving revegetation success
22 may include: emergence of comparatively few plants one year after disturbance; low vegetation
23 cover in the second monitoring year compared to reference plots; and little increase in vegetation
24 between the first and second monitoring year.

25 The certificate holder shall take appropriate action to meet the objectives of this
26 Revegetation Plan. If soil compaction is suspected as the reason for lack of progress, the
27 compacted areas may be deep tilled or scarified to reduce compaction, followed by re-seeding.
28 The certificate holder's qualified investigator shall assess the vegetation that has appeared in the
29 disturbed area to determine specific recommendations for remediation.

30 On an annual basis as part of the annual report on the facility, the certificate holder shall
31 report to the Department the investigator's recommendations and the remedial actions taken. The
32 Department may require re-seeding or other remedial measures in those areas that do not meet
33 the success criteria.

34 If a wildlife habitat area is damaged by wildfire (including any fire that has a cause
35 related to operation of the Helix Wind Power Facility) during the first 5 years following initial
36 seeding, the certificate holder shall work with the landowner to restore the damaged area. The
37 certificate holder shall report to the Department on the damage caused by wildfire and the cause
38 of the fire, if known. The certificate holder shall continue to report on revegetation progress as
39 described in this plan. If a fire occurs on-site after the first 5 years and facility operation is
40 determined to be the cause of the fire, the certificate holder shall consult with the landowner
41 regarding remediation.

Helix Wind Power Facility: Revegetation Plan

[JULY 31, 2009]

1 If an area is not trending toward meeting the success criteria by the fifth monitoring year
2 (and has not been converted by the landowner to an inconsistent use), the certificate holder may
3 conclude that revegetation of the area was unsuccessful and propose appropriate mitigation for
4 the loss of habitat quality or quantity. The certificate holder shall carry out mitigation actions
5 approved by the Department, subject to review by the Oregon Energy Facility Council (Council).

6 5. Reporting

7 The certificate holder shall report to the Department on the success of revegetation in
8 cropland areas on an annual basis until the areas have been successfully revegetated.

9 For wildlife habitat areas, the certificate holder shall report the investigator's findings and
10 recommendations regarding revegetation success to the Department and to ODFW. Reporting
11 will continue on an annual basis until the investigator finds that the condition of a revegetated
12 area satisfies the criteria for revegetation success (or until the Department finds that the
13 landowner has converted the area to a use that is inconsistent with the success criteria) and the
14 Department determines that the certificate holder has met its restoration obligations for that area.

15 The certificate holder shall provide the revegetation records described in Section 1 above
16 and shall report on the progress of revegetation. The certificate holder may include the reporting
17 on revegetation actions and progress in the annual report required under OAR 345-026-0080 or
18 submit this information as a separate document at the same time the annual report is submitted.

19 V. Amendment of the Plan

20 This Revegetation Plan may be amended from time to time by agreement of the
21 certificate holder and the Council. Such amendments may be made without amendment of the
22 site certificate. The Council authorizes the Department to agree to amendments to this plan. The
23 Department shall notify the Council of all amendments, and the Council retains the authority to
24 approve, reject or modify any amendment of this plan agreed to by the Department.