# TECHNICAL REVIEW MEMORANDUM

*Division of Land Resource Regulation*

**TO: Dan Courtemanch – Project Manager, Division of Land Resource Regulation**

**FROM: Art McGlauflin – Engineer, Division of Land Resource Regulation**

**DATE: June 28, 2013**

**SUBJECT: L-25973-24-A-N/L-25973-B-N, Bingham Wind Project, Bingham et al.**

As requested, I have reviewed the stormwater management plan for the proposed Bingham Wind Project in Bingham, Mayfield Township, Kingsbury Plantation, Parkman, and Monson. I have many concerns with the management plan. These concerns are listed below. Please, see me if you have any questions about them. Forward these comments to Dale Knapp at Stantec, to Nicholas Porell at SGC Engineering, and to Steve Blake at Fay, Spofford, and Thorndike after your review. Thank you.

**14.0 Basic Standard (Bingham Wind Project)**

The erosion control, sediment control, and site stabilization plans need to be revised to restrict allowances for field changes, define critical areas more precisely, and incorporate stabilization timing specifications so that they conform to the department's requirements in "Appendix A" of the *Chapter 500, Stormwater Management Rules* and the department's guidance in *Maine Erosion and Sediment Control BMPs.*

1. Plan C9.2 – The applicant should revise the section numbering on the plan sheet so that it matches that in section 14.0 of the combined application. Some sub-sections on the plan sheet have identical numbering.

2. Plan C-9.2, Section 14.2 – The proposed field adjustment allowance for changes in the horizontal alignment without MDEP approval is excessive. Alignment changes of up to 300 feet suggest the plan presented is "conceptual". Given the numerous, small watersheds and steep terrain through which this project runs, changes in alignment could require a substantial re-assessment of the stabilization plans, runoff treatment plans, and resource impacts via a major amendment application. Also, alignment changes of 300 feet would appear to extend well beyond the resource mapping done to date in many areas. For these reasons, I recommend that field adjustment of the horizontal alignment be limited to no more than 25 feet without department approval. As-built plans and, if required, updates to the project stabilization and runoff treatment plans would still be required.

3. Plan Sheet C-9.2, Section 14.3.1 – The applicant should revise the "critical areas" definition to add the following as critical areas: areas draining to and within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool.

4. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the second bullet item under "Permanent Seeding and Mulching Plan" to read as follows: "Final Seeding shall be completed within 7 days following final topsoil and loam grading for non-critical areas. Final seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil and loam grading for critical areas. All final fertilizing and seeding shall adhere to these specifications." The applicant should refer to section 5 of "Appendix A. Erosion and sedimentation control" in the *Chapter 500, Stormwater Management Rules* for the department's permanent stabilization requirements. I have restricted stabilization of critical areas to 48 hours to conform to the general intent to get these areas stabilized quickly in section 3 of "Appendix A. Erosion and sedimentation control" in the *Chapter 500, Stormwater Management Rules*.

5. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the third bullet item under "Permanent Seeding and Mulching Plan" to read as follows: "Seeded areas shall be mulched the same work day. Mulch shall consist of straw/hay, hydro-mulch, or any suitable substitute deemed acceptable by the engineer. Straw, hay, or other mulch applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges. Mulched areas shall be monitored according the *Monitoring Schedule* above. Should mulching prove to be ineffective, straw matting or excelsior matting will be used in its place." The applicant should refer to section A-1 of *Maine Erosion and Sediment Control BMPs* manual for guidance on the use of temporary mulching.

6. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the sixth bullet item under "Permanent Seeding and Mulching Plan" to revise the fifth bullet item to read as follows: "Fertilizing, seeding, and mulching shall be done the same work day that loam is spread on any area. Mulch shall consist of hay or straw applied at twice the normal rate, as specified in *Table 14-1: Stabilization Schedule* below." Same day fertilizing and seeding is a precaution against loam freeze-up during nighttime hours, which would make fertilizer and seed incorporation into the loam difficult or impossible the next day. The applicant should refer to section A-1 of *Maine Erosion and Sediment Control BMPs* manual for guidance on the use of mulch in winter conditions.

7. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the sixth bullet item under "Permanent Seeding and Mulching Plan" to revise the sixth bullet item to read as follows: "All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting. At the Engineer's direction, straw matting or excelsior matting may be substituted for the straw mulch and biodegradable netting." The applicant should refer to section A-1 of *Maine Erosion and Sediment Control BMPs* manual for guidance on the use of temporary mulching.

8. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the second bullet item under "Temporary Seeding and Mulching Schedule" to read as follows: "Temporary mulching or seeding shall be done immediately for any non-critical area not to be worked for an interim period of more than 7 days. Temporary mulching and seeding of critical areas shall occur within 48 hours of initial disturbance or prior to

any storm event, whichever occurs first. Stabilization and seeding requirements shall be determined in accordance with *Table 14-1: Stabilization Schedule* and *Table 14-2: Temporary Seeding Schedule* and shall be implemented at the beginning of the expected interim period. In no case, shall any disturbed soil be left unstabilized for more than 30 days." The applicant should refer to section 3 of "Appendix A. Erosion and sedimentation control" in the *Chapter 500, Stormwater Management Rules* for the department's temporary stabilization requirements.

9. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the fifth bullet item under "Temporary Seeding and Mulching Schedule" to read as follows: "The mulch application rate shall be doubled during winter construction. Mulch shall be applied at the end of each day's work to disturbed soil areas if the area has been fine graded or if snow is predicted or imminent. In no case, shall any area of disturbed soil be left without mulch or other surface cover for more than 7 days during the winter construction period."

10. Plan sheet C-9.2, Section 14.1.1 (should be section 14.5.1) – The applicant should revise the eighth bullet item under "Temporary Seeding and Mulching Schedule" (page 14-11) to read as follows: "Areas within 75 feet of a protected natural resource shall be stabilized with temporary mulching or temporary seeding with mulching and have a sediment barrier installed between the area and resource within 48 hours or prior to any storm event, whichever occurs first." The applicant should refer to section 3 of "Appendix A. Erosion and sedimentation control" in the *Chapter 500, Stormwater Management Rules* for the department's temporary stabilization requirement for areas adjacent resources.

11. Plan sheet C-9.2 section 14.1 Erosion control execution (should be section 14.5) – The applicant should include the following provision: "Ditch Stabilization Plan -- Any section of rough-graded ditch will have stone check dams installed in the ditch within 24 hours to prevent ditch scouring. Any section of finish-graded ditch will be stabilized with permanent lining of grass and or riprap within 7 days for ditches in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for ditches in critical areas."

12. Plan sheet C-9.2 section 14.1 Erosion control execution (should be section 14.5) – The applicant should include the following provision: "Culvert Inlet and Outlet Stabilization Plan – Any culvert installed on the project shall have the appropriate inlet and outlet protection installed within 7 days for culverts in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas."

13. Plan sheet C-9.2 – The applicant should revise this plan sheet or another sheet to include seed mix specifications for the project. I suggest a specific mix be provided for each of the following areas: upland areas with loam cover, upland areas with erosion control mix cover, and areas of slopes and ditches below the water table or line of seepage. Establishment of vegetation on erosion control mix made from on-site stump grinding will be difficult due to wood decomposition using up the available nitrogen. The seed mix for those areas covered with erosion control mix should have a high proportion of nitrogen-fixing plants (trefoil, clover, vetch, etc.).

14. Plan sheet C-9.0 – The applicant should revise note in the "Dirtbag Detail" to read as follows: "The owner's engineer shall designate the location of Dirtbag placement for construction dewatering. In all cases, the Dirtbag will be located in a vegetated, upland area having a slope less than 15% and be at least 75 feet from the edge of any wetland, the edge of any river/stream/brook; and any pond shoreline. No Dirtbag shall be located such that its discharge will flow into a significant vernal pool (whether currently flooded or dry)."

15. Plan sheet C-7.0 – The applicant should revise the "Grassed Line Ditch Detail" to eliminate erosion control mix as a topsoil substitute in note 5.B. Erosion control mix does not allow for the quick vegetation establishment needed for a protective ditch lining and is not stable against channelized flows by itself.

16. Plan sheet C-6.0 – The applicant should revise the "Permissible Back Slope Materials" detail to correct the references to the other details. For example, rip rap for slopes with grades from 2H:1V to 1-1/2H:1V should refer to detail "H" not detail "G".

17. Plan sheet C-5.0 – The applicant should revise the "Pad Details" detail to change the pad stabilization note to read as follows: "Pad areas outside the pad access drive, the crane pad, and the turbine access drive will be covered with four inches of erosion control mix to allow re-establishment of vegetation naturally or will be covered with loam, seeded, and mulched to establish vegetation directly."

18. Plan sheet C-5.0 – The applicant should revise the "Reinforced Turf and Reinforced Erosion Control Mix Details – For Earth Fill Conditions" detail to indicate that the reinforced erosion control mix alternate will still require seeding. The P300 turf reinforcement matting requires vegetation growing through it to stabilize a slope surface. A seed mix containing a large percentage of seed for nitrogen-fixing plants (clovers, trefoils, vetches, etc.) should be used with the erosion control mix.

**14.0 Basic Standard (115kV Generator Lead Project)**

The erosion control, sediment control, and site stabilization plans need to be revised to define critical areas and incorporate stabilization timing specifications so that they conform to the department's requirements in "Appendix A" of the *Chapter 500, Stormwater Management Rules* and the department's guidance in *Maine Erosion and Sediment Control BMPs.*

19. Plan sheet DET-01 – The applicant should amend general erosion control note # 8 to add the following statement: "Permanent Seeding shall be completed within 7 days following final topsoil/loam grading for non-critical areas. Permanent seeding shall be completed within 48 hours or prior to any storm event, whichever occurs first, following topsoil/loam grading for critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool. Seeded areas shall be mulched the same work day. Mulch shall consist of straw, hay, or hydro-mulch. Straw, hay, or other mulch applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges."

20. Plan sheet DET-01 – The applicant should revise erosion control note #10 to read as follows: "Temporary mulching shall be done immediately for any non-critical area not to be worked for a period of more than 7 days. Temporary mulching and seeding of critical areas shall occur within 48 hours of initial disturbance or prior to any storm event, whichever occurs first. A critical area is any area within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool. In no case, shall any disturbed soil be left unstabilized for more than 21 days after initial disturbance. Temporary mulch shall consist of straw or hay applied at 2 tons/acre. Straw or hay applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges."

21. Plan sheet DET-01 – The applicant should revise winter construction note #8 to read as follows: "The mulch application rate shall be doubled during winter construction to 4 tons/acre. Mulch shall be applied at the end of each day's work to disturbed soil areas if snow is predicted or imminent or if the area has been finish graded. In no case, shall any area of disturbed soil be left without mulch or other surface cover for more than 7 days during the winter construction period. All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting."

22. Plan sheet DET-01– The applicant should amend the "Roadside Swale Detail" to add the following note: "Any section of finish-graded ditch will be stabilized with permanent lining of grass and or riprap within 7 days for ditches in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for ditches in critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, shoreline, or vernal pool."

23. Plan sheet DET-01– The applicant should amend the "Stone Check Dam Detail" to add the following note: "Any section of rough-graded ditch will have temporary stone check dams installed in the ditch within 24 hours to prevent ditch scouring."

24. Plan sheet DET-03 – The applicant should amend the "Typical Roadway Cross Culvert Detail" to add the following note: "Any culvert installed on the project shall have the appropriate inlet and outlet protection installed within 7 days for culverts in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas. A critical area is any area within 75 feet of a wetland, river/stream/brook, shoreline, or vernal pool."

**12.0 Stormwater Management - General Standard (Bingham Wind Project)**

The applicant has chosen to apply the general standard on a watershed basis for the Bingham Wind Project. This is acceptable (and more difficult). The following comments are grouped by watershed.

Gulf Stream Watershed

25. The applicant should revise the treatment analysis for project development in the Gulf Stream watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500,*

*Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

26. The applicant must correct the treatment analysis for project development in the Gulf Stream watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Gulf Stream watershed: DT-S77, DT-S78, DT-S79, DT-S80, DT-S81, and DT-S96A. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

27. There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for a level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Gulf Stream watershed:

    - LS-S75 could be reduced to 39′ (C-silt loam, 150′ buffer, wooded, 0.39 acre impervious),
    - LS-S92 could be reduced to 25′ (C-sandy loam, 150′ buffer, wooded, 0.33 acre impervious),
    - LS-S72 could be reduced to 56′ (C-silt loam, 150′ buffer, wooded, 0.56 acre impervious), and
    - LS-S73 could be reduced to 36′ (C-silt loam, 150′ buffer, wooded, 0.36 acre impervious).

28. The applicant must correct the treatment analysis for project development in the Gulf Stream watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffers in the Gulf Stream watershed: DT-S84, DT-S90, and DT-S95. Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet or, in some cases, replacing the turnout buffers with roadside buffers.

29. It is unclear how the runoff from Access Road #1 is to get to ditch turn-out DT-S95. It would seem that replacing DT-S95 with a roadside buffer to treat runoff from station 79+00 to 82+00 and relocating the 18-inch culvert south to the wetland swale would be a better drainage solution than a ditch turn-out in this location.

30. The applicant should correct the treatment analysis for the Gulf Stream watershed to start the road section draining to stone berm level lip spreader buffer LS-S6 at 29+00 feet. Road runoff before this station will not drain to the level spreader on this steep road section.

31. The applicant should revise the treatment analysis for the Gulf Stream watershed to correct the area treated by stone berm level lip spreader buffer LS-S49 and LS-S51. It appears that drainage from T73's pad access drive, crane pad, and turbine access way will flow to LS-S51 rather than west to LS-S49. The applicant should resize LS-S51 for the additional 0.28 acre of impervious area draining from T73 to LS-S-51 and resize LS-S49 for the 0.28 acre of reduced impervious area draining to it.

32. The applicant should revise the treatment analysis for the Gulf Stream watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-S19 treating runoff from T10 and AD-S2 treating runoff from T11.

Fall Brook Watershed

33. The applicant should revise the treatment analysis for project development in the Fall Brook watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500, Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

34. There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Fall Brook watershed:

    - LS-S11 could be reduced to 21' (C-gravelly loam, 150' buffer, wooded, 0.28 acre impervious),

    - LS-S18 could be reduced to 30' (C-silt loam, 150' buffer, wooded, 0.30 acre impervious), and

- LS-S25 could be reduced to 36' (C-silt loam, 150' buffer, wooded, 0.30 acre impervious, >8% slope).

35. The applicant should correct the treatment analysis for the Fall Brook watershed to end the road section draining to roadside buffer AD-S7 at 52+00. Road runoff after this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-S13.

36. The applicant should correct the treatment analysis for the Fall Brook watershed to end the road section draining to roadside buffer AD-S9 at 63+00. Road runoff before this station on this steep road section will not drain to the level spreader but, instead, drain via the road ditch to LS-S17. LS-S17 should be also be resized for the additional 100 feet of road drainage.

37. The applicant should correct the treatment analysis for the Fall Brook watershed to eliminate roadside buffer AD-S11 for treating from station 67+50 to station 71+50 of crane road #1. This buffer does not run directly alongside this section of roadway.

38. The applicant should correct the treatment analysis for the Fall Brook watershed to end the roadway section draining to AD-S15 at 108+00. The buffer slope beyond this station exceeds 20%.

39. The applicant should correct the treatment analysis for the Fall Brook watershed to eliminate ditch turn-out buffer DT-S21 for treating road runoff from station 111+50 to 114+00. The slope of this ditch turn-out buffer exceeds 15%. The applicant should consider bringing the ditch ending at 109+50 through the woods to a buffer on a less steep area downslope.

40. The applicant should revise the treatment analysis for the Fall Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-S16 treating runoff from T1, to AD-S11 treating runoff from T5, to AD-S10 treating runoff from T6, to AD-S8 treating runoff from T7, to AD-S18 treating runoff from T7alt, to AD-S6 treating runoff from T8, and to AD-S3 treating runoff from T9.

41. The buffer area designated for treating runoff from T1 exceeds the maximum slope allowed for any buffer type. Another, less steep area will be necessary for a buffer if buffer treatment of runoff from T1 is to be credited in the general standard analysis for the Fall Brook watershed.

Kingsbury Stream Watershed

42. The applicant should revise the treatment analysis for project development in the Kingsbury Stream watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500, Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

43. The applicant must correct the treatment analysis for project development in the Kingsbury Stream watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Kingsbury Stream watershed: DT-N91, DT-N98, and DT-104. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

44. The applicant must correct the treatment analysis for project development in the Kingsbury Stream watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffer in the Kingsbury Stream watershed: DT-N108. Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet.

45. There is an instance where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreader could be reduced significantly in length within the Kingsbury Stream watershed: LS-N110 could be reduced to 25' (C-sandy loam, 150' buffer, wooded, 0.28 acre impervious, >8% slope).

46. The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to roadside buffer AD-N42 at station 1546+50. Road runoff before this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-N106.

47. The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to roadside buffer AD-N17A at station 905+50. Road runoff before this station will not drain through this roadside buffer but, instead, drain via the road ditch to DT-S13.

48. The applicant should correct the treatment analysis for the Kingsbury Stream watershed to start the road section draining to level spreader buffer LS-N92 at station 127+50. Road runoff before this station on this steep section of road will not drain to this level spreader.

49. The applicant should correct the treatment analysis for the Kingsbury Stream watershed to end the road section draining to roadside buffer AD-N36 at station 1240+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

50. The applicant should correct the treatment analysis for the Kingsbury Stream watershed to end the road section draining to roadside buffer AD-N38A at station 1266+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

51. The applicant should revise the treatment analysis for the Kingsbury Stream watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-N15A treating runoff from N36, AD-N20 treating runoff from T41, AD-N43 treating runoff from T42, AD-N40 treating runoff from T44, AD-N30 treating runoff from T47, AD-N37 treating runoff from T49, AD-N38 treating runoff from T50, and AD-N39 treating runoff from T51.

<u>Rift Brook Watershed</u>

52. The applicant should revise the treatment analysis for project development in the Rift Brook watershed to show the general standard is met for both the new <u>and</u> redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500, Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

53. The applicant must correct the treatment analysis for project development in the Rift Brook watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers

being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Rift Brook watershed: DT-S30, DT-S31, and DT-S32. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

54. There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Rift Brook watershed:

    - LS-S56 could be reduced to 36′ (C-silt loam, 150′ buffer, wooded, 0.36 acre impervious),
    - LS-S29 could be reduced to 17′ (C-silt loam, 150′ buffer, wooded, 0.17 acre impervious),
    - LS-S27 could be reduced to 28′ (C-silt loam, 150′ buffer, wooded, 0.28 acre impervious),
    - LS-S39 could be reduced to 35′ (C-silt loam, 150′ buffer, wooded, 0.35 acre impervious),
    - LS-S41 could be reduced to 16′ (C-sandy loam, 150′ buffer, wooded, 0.21 acre impervious), and
    - LS-S44 could be reduced to 47′ (C-sandy loam, 150′ buffer, wooded, 0.62 acre impervious).

55. The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S23 at station 361+00. Road runoff after this station on this steep section of road will not drain through this roadside buffer.

56. The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S22 at station 378+00. The 400 feet of road after this station will concentrate at the junction of crane road #5 and turbine pad T13. Use a level spreader at this location to spread the road runoff into a buffer.

57. The applicant should correct the treatment analysis for the Rift Brook watershed to eliminate runoff treatment from station 403+00 to station 404+00 of crane road #5 in roadside buffer AD-S20. AD-S20 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

58. The applicant should correct the treatment analysis for the Rift Brook watershed to end the road section draining to roadside buffer AD-S26 at station 411+50. The 150 feet of road after this station will concentrate at the junction of crane road #6 and crane road #26. Use a level spreader at this location to spread the road runoff into a buffer.

59. The applicant should revise the treatment analysis for the Rift Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-S22 treating runoff from T13, AD-S35 treating runoff from T16, AD-S34 treating runoff from T17, AD-S29 treating runoff from T75, AD-S27 treating runoff from T76, and AD-S28 treating runoff from T77.

Baker Flowage Watershed

60. The applicant should revise the treatment analysis for project development in the Baker Flowage watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500, Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

61. The applicant must correct the treatment analysis for project development in the Baker Flowage watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Baker Flowage watershed: DT-N27, DT-N32, DT-N26, and DT-N27. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

62. The applicant must correct the treatment analysis for project development in the Baker Flowage watershed to limit ditch lengths draining to ditch turn-out buffers with A, B, and C-sandy loam soils to 250 feet when two lanes of roadway are draining to the turn-out. This affects the following ditch turn-out buffers in the Baker Flowage watershed: DT-N32. Additional turn-outs will be needed to limit the ditch length to each turn-out to 250 feet or, in some cases, replacing the turnout buffers with roadside buffers.

63. There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a

spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Baker Flowage watershed:

- LS-N28 could be reduced to 19′ (C-silt loam, 150′ buffer, wooded, 0.19 acre impervious),
- LS-N34 could be reduced to 54′ (C-sandy loam, 150′ buffer, wooded, 0.72 acre impervious),
- LS-N37 could be reduced to 37′ (C-silt loam, 150′ buffer, wooded, 0.37 acre impervious),
- LS-N40 could be reduced to 38′ (C-sandy loam, 150′ buffer, wooded, 0.50 acre impervious), and
- LS-N31 could be reduced to 22′ (C-silt loam, 150′ buffer, wooded, 0.22 acre impervious).

64. The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 804+00 to station 807+50 of crane road #11 in roadside buffer AD-N13. AD-N13 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

65. The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 815+50 to station 818+50 of crane road #11 in roadside buffer AD-N14. AD-N14 is not directly adjacent this roadway section. As such, runoff from this section of road must travel a few hundred feet over the turbine pad and, so, can't be expected to be in sheet flow upon reaching the buffer.

66. The applicant should correct the treatment analysis for the Baker Flowage watershed to eliminate runoff treatment from station 831+00 to station 832+00 of crane road #11 in roadside buffer AD-N14A. Runoff from this section of road will concentrate at the junction of crane road #11 and turbine pad T34. Use a level spreader at this location to spread the road runoff into a buffer.

67. The applicant should correct the treatment analysis for the Baker Flowage watershed to start the road section draining to roadside buffer AD-N14B at 836+00. Road runoff before this station on this section of road will not drain through this roadside buffer.

68. The applicant should revise the treatment analysis for the Baker Flowage watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders.

It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-N13 treating runoff from T32, AD-N14 treating runoff from T33, AD-N14A treating runoff from T34, AD-N15 treating runoff from T35, AD-N15A treating runoff from T36, AD-N16 treating runoff from T37, AD-N17 treating runoff from T38, and AD-N18 treating runoff from T39.

Thorn Brook Watershed

69. The applicant should revise the treatment analysis for project development in the Thorn Brook watershed to show the general standard is met for both the new and redeveloped impervious area. Per the redevelopment standard in section 4.B(3)(f) of the *Chapter 500, Stormwater Management Rules*, those impervious portions of roadways existing prior to November 19, 2005 that will be redeveloped (upgraded) as project roadways must meet the general standard to the extent practicable. In this case, this means treating 75% of the redeveloped roadway under the linear exception to the general standard.

70. The applicant must correct the treatment analysis for project development in the Thorn Brook watershed to limit ditch lengths draining to ditch turn-out buffers with C-silt loam soils to 190 feet when two lanes of roadway are draining to the turn-out. The 250 foot limit is only applicable to buffers with A, B, or C-sandy loam soils. No guidance is actually given in the buffer rules for the situation when two lanes drain to a buffer with C-silt loam soil. I am willing to allow a maximum ditch length of 190 feet to these buffers based on the maximum ditch length allowed for a single lane draining to these buffers being 300 feet (300/400 x 250 feet ≈ 190 feet). This affects the following ditch turn-out buffers in the Thorn Brook watershed: DT-N70. Additional turn-outs will be needed to limit the ditch length to each turn-out to 190 feet.

71. There are several instances where a stone berm level lip spreader is substantially oversized for the soil and buffer length below it. I recommend not oversizing the level spreader lengths, as grade control for the level lip gets more difficult the longer a spreader gets. It appears the following stone berm level lip spreaders could be reduced significantly in length within the Thorn Brook watershed:

    - LS-N60 could be reduced to 22′ (C-sandy loam, 150′ buffer, wooded, 0.29 acre impervious),
    - LS-N71 could be reduced to 37′ (C-silt loam, 150′ buffer, wooded, 0.31 acre impervious, > 8% slope)
    - LS-N63 could be reduced to 30′ (C-sandy loam, 150′ buffer, wooded, 0.33 acre impervious, > 8% slope)
    - LS-N66 could be reduced to 64′ (C-silt loam, 150′ buffer, wooded, 0.53 acre impervious, slope > 8%),

- LS-N89 could be reduced to 15′ (C-sandy loam, 150′ buffer, wooded, 0.20 acre impervious), and

- LS-N84 could be reduced to 30′ (C-silt loam, 150′ buffer, wooded, 0.25 acre impervious, slope > 8%).

72. The applicant should correct the treatment analysis for the Thorn Brook watershed to eliminate runoff treatment from station 1415+00 to station 1418+50 of crane road #18 in roadside buffer AD-N33. Runoff from this section of road will concentrate at the junction of crane road #18 and turbine pad T55. Use a level spreader at this location to spread the road runoff into a buffer.

73. The applicant should revise the treatment analysis for the Thorn Brook watershed so to eliminate the treatment of turbine pad runoff with roadside buffers. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from the turbine pads will not sheet flow into the proposed buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 or more feet of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the turbine pads will need to be delivered to the buffers using stone berm level lip spreaders. It is also possible to use a turbine pad's surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*). This comment applies to AD-N26 treating runoff from T45, AD-N29 treating runoff from T53, AD-N28 treating runoff from T54, AD-N33 treating runoff from T55, and AD-N31 treating runoff from T57.

<u>Operations & Maintenance Facility</u>

74. The applicant should revise plan sheet C-SW3.0 to include construction oversight specifications for the two vegetated underdrain filters to be built on the O&M Facility. The oversight language should be similar to that given for the wetpond (Note #3) on plan sheet C-SW3.1, indicating the points during construction at which engineering inspection and monitoring of each filter basin's construction will take place.

75. The applicant should revise plan sheet C-SW3.0 to relocate the overflow spillway for vegetated underdrain filter #2 to the south end of the pond. Design criteria in section 3b of Appendix E of the *Chapter 500, Stormwater Management Rules* require emergency spillways to be located over undisturbed soil, wherever possible.

76. The applicant should revise plan sheet C-SW3.0 to reduce the grade of the overflow spillway for vegetated underdrain filter #1 so that the grade is 20% or less. Design criteria in section 3b of Appendix E of the *Chapter 500, Stormwater Management Rules* require spillways with flexible linings to have an exit channel grade of 20% or less. The easiest means to accomplish this grade reduction is probably to relocate the spillway to the west end of the basin and make the fill slope in this location 5H:1V instead of 3H:1V.

**12.0 Stormwater Management - Phosphorus Standard (Bingham Wind Project)**

The phosphorus standard has been applied to five pond watersheds in which the project will be located. The phosphorus standard must be met for each pond independently. The following comments are grouped by watershed.

Withee Pond Watershed

77. The applicant should revise the treatment calculations for Withee Pond to use a treatment factor of 0.2 for LS-S50. Standard sizing for 0.54 acre of impervious area draining to a 150-foot, wooded buffer on sandy loam soil (Dixfield-Marlow Association) requires a 41-foot level spreader to receive a treatment factor of 0.4. The proposed 82-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in *Volume II: Phosphorus Control in Lake Watersheds*.

Smith Pond Watershed

78. The applicant should revise the treatment of runoff from turbine pad T15 in the Smith Pond watershed. The current plan uses a roadside buffer to treat the pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from this turbine pad doesn't sheet flow into the buffer, as runoff from the pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*).

Hilton Pond #1 Watershed

79. The applicant should revise the project phosphorus budget calculation (worksheet 1) for Hilton Pond #1 to eliminate the project acreage reduction due to steep slopes. Only areas of sustained slopes greater than 25% that are greater than one acre in size need to be subtracted from the project acreage. This change will increase the project acreage to 22.48 acres for both the standard calculation and for the small watershed adjustment. The project's phosphorus budget (PPB) will be the smaller of that found from the standard calculation and from the small watershed adjustment.

80. The applicant should revise the treatment calculations for Hilton Pond #1 to use a treatment factor of 0.2 for LS-N87. Standard sizing for 0.52 acre of impervious area draining to a 150-foot, wooded buffer on sandy loam soil (Colonel-Brayton-Lyman Complex) and 9.3% slope requires a 47-foot level spreader to receive a treatment factor of 0.4. The proposed 95-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in *Volume II: Phosphorus Control in Lake Watersheds*.

81. The applicant should revise the treatment of runoff from turbine pad T48 and turbine pad T58 in the Hilton Pond #1 watershed. The current plan uses a roadside buffer to treat each pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from these turbine pads doesn't sheet flow into the buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach a buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from each pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*).

82. The transition from CR18 to the existing road south of turbine pad T58 appears to conflict with draining runoff to LS-N87. The applicant should revise plan sheet C-N1.28 to show the expected transition grading and the necessary culvert placement to bring ditch runoff to LS-N87.

Kingsbury Pond Watershed

83. The applicant should check the project phosphorus budget for Kingsbury Pond to make sure that the steep slope acreage being subtracted from the total acreage of the development parcel is due to steep slope areas that are over one acre in size. Steep slope areas that are less than one acre in size do not need to be subtracted from the total acreage of the development parcel to find the project acreage.

84. The applicant should revise the treatment of runoff from turbine pad T28 in the Kingsbury Pond watershed. The current plan uses a roadside buffer to treat the pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from this turbine pad doesn't sheet flow into the buffer, as runoff from the pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach the buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from the pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*).

85. The applicant should revise plan sheet C-N1.08 to relocate/reorient DT-N18 a bit further west so to avoid runoff flowing back against road embankment rather than through the buffer.

86. The applicant should correct the treatment calculations for Kingsbury Pond to eliminate runoff treatment from station 751+50 to station 753+00 of crane road #11 in roadside buffer AD-N8. Runoff from this section of road will concentrate at the junction of crane

road #11 and turbine pad T28. If treatment is needed for this road section to meet the phosphorus standards, then the plan should use a level spreader to spread the road runoff into a buffer at the junction of the road and crane pad.

87. The applicant should revise the treatment calculations for Kingsbury Pond to use a treatment factor of 0.2 for LS-N22. Standard sizing for 0.36 acre of impervious area draining to a 150-foot, wooded buffer on Elliotsville (HSG B) and Monson (HSG C/D) soils requires a 27-foot level spreader to receive a treatment factor of 0.4. The proposed 54-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in *Volume II: Phosphorus Control in Lake Watersheds*. – [see the following comment]

88. The road runoff from station 1805+00 to 1807+25 of crane road #22 will drain to Kingsbury Pond via the road ditch and LS-N22. The impervious area from these 225 feet of roadway should be included in the Kingsbury Pond watershed.

89. The applicant should revise the treatment calculations for Kingsbury Pond to use a treatment factor of 0.2 for LS-N21. Standard sizing for 0.52 acre of impervious area draining to a 150-foot, wooded buffer on Elliotsville (HSG B) and Monson (HSG C/D) soils requires a 39-foot level spreader to receive a treatment factor of 0.4. The proposed 79-foot level spreader allows use of the minimum treatment factor of 0.2 per Table 4.1 in *Volume II: Phosphorus Control in Lake Watersheds*.

<u>Mayfield Pond Watershed</u>

90. The applicant should check the project phosphorus budget for Mayfield Pond to make sure that the steep slope acreage being subtracted from the total acreage of the development parcel is due to steep slope areas that are over one acre in size. Steep slope areas that are less than one acre in size do <u>not</u> need to be subtracted from the total acreage of the development parcel to find the project acreage.

91. The applicant should revise the treatment calculations for Mayfield Pond to use a treatment factor of 0.15 for DT-S58 (the minimum allowed per Table 4.1 in *Volume II: Phosphorus Control in Lake Watersheds*). The buffer length proposed below the turn-out is more than twice that needed for 223 feet of road draining to a wooded buffer on HSG "B" soils (Elliotsville).

92. The applicant should correct the treatment calculations for Mayfield Pond to eliminate runoff treatment from station 600+00 to station 652+50 of crane road #9 in roadside buffer AD-S32. AD-S32 is not directly adjacent the travel surface and shoulder of this section of road such that runoff can sheet into the buffer. Much of this section is over 150 feet from the buffer and, so, can't reasonably be expected to be in sheet flow upon reaching the buffer's edge.

93. The applicant should revise the treatment of runoff from turbine pads T18, T20, T21, T22, T23, T24, T25, T26, T27, T29, and T30 in the Mayfield Pond watershed. The current plan uses a roadside buffer to treat each pad's impervious area runoff. Roadside buffers are limited to treating road runoff where the runoff from the road surface and shoulder sheets immediately into the buffer. Runoff from these turbine pads doesn't sheet flow

into these buffers, as runoff from each pad's access drive, crane pad, and turbine access way will need to cross 150 feet or more of pad surface to reach a buffer (at which point the runoff can't reasonably be expected to be in sheet flow). Runoff from each pad's impervious areas will need to be delivered to the buffer using a ditch and stone berm level lip spreader. It is also possible to use the pad surface as a buffer provided either a dense sod is established on the pad or the pad is covered with erosion control mix and vegetation established using an appropriate seed mix (see section 2(b)(ii) and section 6 of "Appendix F" in the *Chapter 500, Stormwater Management Rules*).

94. The applicant should correct the treatment calculations for Mayfield Pond to eliminate runoff treatment from station 678+50 to station 681+50 of crane road #10 in roadside buffer AD-N5. AD-N5 is not directly adjacent the travel surface and shoulder of this section of road such that runoff can sheet into the buffer. This section of road is over 300 feet from the buffer and, so, can't reasonably be expected to be in sheet flow upon reaching the buffer's edge.

95. The applicant should correct the treatment calculations for Mayfield Pond to end road drainage from crane road #10 to AD-N5 at 706+00. Road drainage after this station on this steep section of road will drain via the road ditch and culvert to LS-N7.

96. The applicant should correct the treatment calculations for Mayfield Pond to start the road drainage from crane road #10 to LS-N7 at 706+00. The length of the level spreader for LS-N7 should also be resized to account for the additional runoff from the roadway impervious area.

97. The applicant should correct the treatment calculations for Mayfield Pond to start the road drainage from crane road #22 to AD-N9 at 1807+25. The road runoff from station 1805+00 to 1807+25 of crane road #22 will drain to Kingsbury Pond via the road ditch and LS-N22. The impervious area from these 225 feet of roadway should not be included in the Mayfield Pond watershed.

**12.0 Stormwater Management - General Standard (115kV Generator Lead Project)**

The applicant has chosen to apply the general standard on a project basis (the normal basis under the general standard) for the 115kV Generator Lead Project. The following comments are grouped by watershed and access road.

<u>Piscataquis River (AR-120)</u>

98. The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 3+50 feet. Road runoff after this station will flow past the turn-out to BMP#3.

99. The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 3+50 and to end the roadway drainage to BMP #3 at 5+75. Road runoff after station 5+75 will flow past the turn-out to BMP #4.

100. The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 5+75 and to end the roadway drainage to BMP #4 at 9+25. Road runoff after station 9+25 will flow past the turn-out.

Gales Brook (AR-212)

101. The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 7+25. Road runoff after this station will flow past the turn-out to BMP #3.

102. The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 7+25 and to end the roadway drainage to BMP #3 at 10+25. Road runoff after station 10+25 will flow past the turn-out to BMP #4.

103. The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 10+25 and to end the roadway drainage to BMP #4 at 13+25. Road runoff after station 13+25 will flow past the turn-out to BMP #5.

104. The applicant should revise the treatment analysis to start the road section draining to ditch turn-out buffer BMP #5 at station 13+25 and to end the roadway drainage to BMP #5 at 16+25. Road runoff after station 16+25 will flow past the turn-out.

Gales Brook (AR-230)

105. The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #1 at station 2+25. Road runoff after this station will flow past the turn-out.

106. The applicant should correct the treatment analysis to end the road section draining to ditch turn-out buffer BMP #2 at station 6+25. Road runoff after this station will flow past the turn-out.

107. The applicant should correct the treatment analysis to start the road section draining to roadside buffer BMP #3 at station 6+75 (instead of 7+00).

108. The applicant should correct the treatment analysis to end the road section draining to roadside buffer BMP #4 at station 29+50. Road runoff beyond this station will not get full treatment through the buffer.

Carlton Stream (AR-300)

109. The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #2 at station 6+25 and end the road drainage to BMP #2 at 8+25. Road drainage before station 6+25 will flow past the turn-out.

110. The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #3 at station 8+25 and end the road drainage to BMP #2 at 11+25. Road runoff before station 8+25 will flow to BMP #2.

111. The applicant should correct the treatment analysis to start the road section draining to ditch turn-out buffer BMP #4 at station 11+25. Road runoff before station 11+25 will flow to BMP #3.

Kingsbury Stream (AR-390)

112. The applicant should correct the treatment analysis to start the road section draining to roadside buffer BMP #1 at 1+50. Road runoff before this station will not get full treatment through the buffer.

**12.0 Stormwater Management – Flooding Standard (Bingham Wind Project)**

113. The applicant should revise the pre-development and post-development runoff analyses for the operations and maintenance facility site to use the curve number for the "good" condition in modeling the woodlands. Generally, the use of the fair condition requires management conditions (e.g. heavy livestock grazing or burning) that significantly reduces the understory vegetation, significantly reduces the litter layer, and compacts the surface soils.

114. The applicant should revise the pre-development and post-development runoff analyses for the substation and DRD facility site to use the curve numbers for the "good" condition in modeling the woodlands and brush lands. Generally, the use of the fair condition requires management conditions (e.g. heavy livestock grazing) that significantly reduces the understory vegetation, significantly reduces the litter layer, and compacts the surface soils.