LUPC Subdivision Rule Review

Maine Land Use Planning Commission

Preliminary Technical Issues Report

June 2015

INTRODUCTION

In planning for the subdivision rule review process, Land Use Planning Commission (LUPC) staff developed a Master Issues List (Appendix A). The List was intended to be a starting point for the rule review process to make sure that all possible issues with the current LUPC subdivision rules that stakeholders felt should be addressed in the process were identified. The process for developing the List is more fully described in the "Report of Stakeholder Meeting #1" located on the LUPC's website at the address:

http://www.maine.gov/dacf/lupc/projects/subdivision_review/Facilitated_Process/MeetingOne/ReportLUPCSubdivisionRulesStakeholder_Meeting1.pdf.

The Master Issues List was divided into two categories of issues; technical/ procedural issues and policy issues. In the first of four stakeholder meetings, the stakeholders finalized and prioritized both sets of issues. This report summarizes the feedback from the stakeholders on the technical issues discussed in Meetings Three and Four, and proposes next steps to move the process forward. In the interest of time, discussion of the technical issues during the stakeholder meetings focused on the high and medium priority issues. The LUPC will work on any technical issues rated as low priority and not addressed in this process at a later time.

Table 1 – Technical Issue Priorities

HIGHEST PRIORITY ISSUES	
The level of soil survey information required for subdivisions	40
Allowing small subdivisions (e.g., 5 or less lots) to submit less information	39
Road crossing standards such as bridges and culverts	37
A process for submitting a plan for subdivision on a phased basis	37
The number of soils test pits required on a lot – one or two	37
The maximum sustained grade for Class 1 roads	34
MEDIUM PRIORITY ISSUES	
Allowing development on steeper slopes with adequate erosion control	29
Calculations of phosphorous loading from road construction	28
The level of site inventory and analysis for a pre-application meeting	23
Use of appropriate building materials	21
Revised standards to be consistent with DEP subdivision standards	20
LOW PRIORITY ISSUES	
Ways to help applicants anticipate review time	17
Reducing the setback from internal roads within the subdivision	14
Requiring a mandatory pre-application conference	12
Revision of the clearing standards to allow reduced clearing limitations	12
Steps to insure better long term maintenance of common infrastructure	7-10
Public notice provisions to ensure adequate public participation	9
Clarification for when a subdivision permit vests	9
Standards to address vegetative clearing for hillside development	7
Review of title, right, and interest review	6

For Stakeholder Meeting Three and Meeting Four, the highest and medium priority issues were grouped into four topic areas: soil investigation and mapping, maximum road grade, subdivision layout and design, and application process. The rest of this reported will be divided by those major topic areas. For each topic area, the report provides a summary of the background information and options considered, the results of the stakeholder discussions, and a proposal for next steps. More detailed background information on these topic areas is included in the background report, "Technical Issues Background Information and Worksheets" developed for Meeting Three, found on the LUPC's website at the web address: http://www.maine.gov/dacf/lupc/projects/subdivision_review/subdivision_review.shtml.

SOIL INVESTIGATION AND MAPPING

Background

In preparing for discussions on this topic area, LUPC staff reviewed soil investigation and mapping requirements included in:

a. The current LUPC subdivision permit application,

b. The State Model Subdivision Regulations, and

c. The DEP Site Law permit application.

From this review, staff developed a list of options for discussion at Meetings Three and Four.

Currently, LUPC uses a model for determining soil survey intensity based primarily on the developed vs. undeveloped areas of the lot:

a. Level 1 subdivisions- Class A high intensity soil surveys for developed areas and Class B high intensity soil surveys for undeveloped areas in subdivisions.

b. Level 2 subdivisions - Class B surveys for developed areas and Class C medium intensity soil surveys for undeveloped areas.

The State Model Subdivision Regulations recommends a Class A survey, but includes an option for a planning board to waive the survey level. The DEP bases its soil survey intensity on the size of the lots, and includes a waiver for open space areas.

For soil test pits required when onsite subsurface wastewater disposal is proposed, the LUPC currently requires 2 test pits per lot. Both the State Model Subdivision Regulations and the DEP Site Law permit application start with 1 test pit per lot, but require additional test pits where soil limitations are found on the lot.

Two worksheets were developed on this topic and stakeholders were asked to respond to a series of questions on each worksheet. Individual responses were collected on a master spreadsheet. A copy of the tabulated results is attached as Appendix B.

Results

Generally speaking, stakeholders supported a model in which the intensity of the soil survey is based on the current LUPC model where more intense soils information is required for proposed developed areas within a subdivision, and lower intensity soils information is required for proposed undeveloped areas. Stakeholders listed road placement and siting building envelopes as warranting a higher level of soils mapping. Some stakeholders suggested that the proximity to sensitive areas and evidence of soil limitations (such as data on the Natural Resource Conservation Service (NRCS) soil survey map) be considered in determining the level of soil information needed. Others suggested that the highest level of soil surveys be done at the building permit stage. Additional major points on soil survey intensity included statements that a Class A level is not necessary for residential development, Class B is sufficient for road placement and building envelopes, the DEP waives soil survey requirements if a geotechnical survey is done for proposed structures, and provisions for waiving the level of intensity for soil mapping should be included.

During the discussion on this topic area, stakeholders spent some time talking about published NRCS soil survey maps. Two Certified Soil Scientists, Lee Burman and Steve Howell, participating in the meetings, reported that soils data published by the NRCS is more accurate than it has been in the past and that NRCS data is field verified. They recommended that the published maps be used more for planning and rezoning purposes. However, many stakeholders were concerned about using the published mapping as a factor for limiting subdivision locations. Though the mapping may be more accurate, the concern is the ratings for low density development potential (LDD) are conservative. With the size of the map units used for the survey, a large area may be rated as low or very low for LDD when just 50% of the map unit has soils not well suited for development. It was also noted that soil limitations for most soils rated with low or very low LDD can be overcome with proper design and engineering.

Lee Burman and Steve Howell submitted a proposal for the group to consider on soil map intensity; a copy is attached in Appendix C. In general, it appears the proposal was well supported by the stakeholders, but many indicated a need for additional time to consider the proposal before finalizing a recommendation.

In terms of the number of test pits per lot, the general consensus of the group appears to support following the DEP requirements for subdivisions. The Maine State Plumbing Code only requires one test pit for design of a subsurface wastewater disposal system. However, there was agreement that it made sense to require more test pits when soil limitations are identified. The stakeholders requested more research be done on this issue, especially on what municipalities are currently requiring for the number of test pits per lot. Stakeholders also requested the LUPC require less documentation on soil test pits than the DEP currently requires. The concern is the amount of documentation required by DEP is unnecessary and burdensome. One option discussed for documentation was to require a test pit summary log for all test pits, but only one soils description for each soil type.

There was also early discussion on whether a written certification completed by a licensed site evaluator (LSE) could be used in lieu of digging additional test pits on subdivision lots. The written certification by a LSE, as recommended in the State Model Subdivision Regulations, is intended to confirm sufficient area of suitable soils to support construction and operation of a subsurface wastewater disposal bed. Stakeholders responded that a site evaluator is already required to verify that the soil area is sufficient to support the size of the disposal bed in their evaluation. There was belief expressed in the group that a stamped site evaluation is a guarantee that the soils are sufficient in area

Additional research

In response to the request for more information about what municipalities require, the LUPC reviewed the soil survey intensity and soil test pit requirements for a number of municipalities with online subdivision ordinances, focusing on northern and eastern service area communities. The results are included in Table 2.

Table 2- Soil Survey Intensity and Test Pit Requirements

Town/ City	Soil Survey Intensity	Test pits
Bethel	Not specified	1 test pit/ lot
Carrabasset Valley	NRCS map, unless soil limitations identified	Not specified
Caribou	High intensity survey	Not specified
Dexter	Site specific map required if soil limitations found	1/lot unless limitation w/i 24"
Dover-Foxcroft	Not specified	Not specified
Farmington	Not specified	Not specified
Fort Kent	High intensity survey	1/lot unless limitation w/i 12"
Greenville	Not specified	Not specified
Hermon	High intensity survey	1/lot unless limitation w/i 24"
Levant	High intensity survey	1 test pit/ lot
Lincoln	Site specific survey- intensity not specified	Not specified
Madawaska	Class B high intensity survey	Not specified
Millinocket	Site specific survey- intensity not specified	Not specified
Orono	Class C medium intensity survey	2 test pits/lot
Pittsfield	High intensity survey	Not specified
Rockland	Site specific survey- intensity not specified	Not specified
Rumford	Site specific survey- intensity not specified	Not specified
Skowhegan	Medium intensity survey, unless limitations found	1/lot unless limitation w/i 12"
Van Buran	High intensity survey	1/lot unless limitation w/i 24"

In addition, LUPC staff spoke with Lindsay Hodgman, Assistant State Soil Scientist with the NRCS, about the accuracy and use of the published soil survey maps. Lindsay agreed that current published maps are more accurate than they have been in the past and are field verified. However, the unorganized areas of the State were mapped at a different level than the organized areas. Unorganized areas were mapped at a Map Order 3, with map units of 15 acres. The map units have a lot of soil associations and complexes. She stated that subdivisions should be looked at a little closer. She also indicated that the published maps are useful for planning purposes, but were not intended to be used for project design.

Next Steps

Chapter 10, Section 10.25,G, Soil Suitability establishes submission requirements and standards relating to soil suitability for all subdivisions as well as commercial, industrial and other non-residential development. After considering the stakeholder feedback from the Stakeholder Meetings Three and Four, LUPC staff has developed a proposed rule revision for Section 10.25, G that will be presented along with this report to the Commission for its consideration. A copy of all proposed rule revisions intended to address technical issues identified in the Commission's subdivision rule review process are attached in Appendix D.

The stakeholder group's recommendation to reduce the soil survey intensity for subdivisions has been incorporated into the proposal. The LUPC staff agrees that a Class A soil survey with map units of 1/8 acre or less may not be needed for many residential subdivisions, particularly those not located in sensitive areas. However, the LUPC is concerned that the NRCS published maps with large map units may not provide sufficient accuracy for the proper design and review of subdivisions. In addition, the map units for Class B soil surveys allow inclusions of dissimilar soils up to an acre in size. With building envelopes potentially a half acre or one acre in size, the Class B map units may be larger than the proposed developed area on each lot, which also may not provide sufficient accuracy to ensure that the building envelopes have been properly located. The proposed rule revision seeks to achieve a balance between the concerns identified by stakeholders and the information needed to address applicable review criteria in LUPC rules. Waivers from some soil survey requirements are included as recommended by the stakeholder group.

MAXIMUM ROAD GRADE

Background

One of the technical issues that was rated as a high priority issue in Stakeholder Meeting One was a recommendation for the LUPC to address the maximum sustained grade for Class 1 roads. One stakeholder commented that the maximum grade of 10% is a significant hardship for development in several regions of the LUPC service area, requiring significant cuts and fills, and resulting in more earth-moving activity than would be necessary with a steeper grade. In response, the LUPC researched:

a. Current LUPC requirements,
b. State Model Subdivision Regulation recommendations,
c. DEP regulations, and
d. Fire code requirements for fire access roads.

Based on the initial research, the LUPC developed a possible option for consideration that was presented at Meeting Three. During Meeting Three, stakeholders requested additional background information on fire code requirements in northeastern states and municipal road standards for towns located in the western mountain area of the state including Carrabassett Valley. The additional research was presented at Meeting Four. In general, the Commission found that northeastern states do not have a maximum road grade in their adopted fire codes. The only northeasterly state identified with a specific maximum road grade for fire access roads, was New York which uses a maximum road grade of 10%.

Table 3-Maximum road grade standards, western Maine municipalities

TOWN	MAXIMUM ROAD GRADE (%)		
CARRABASSETT VALLEY	Collector	Residential Collector	Residential Access
	10	12	12
BETHEL	Collector	Local	Minor
	10	12	12
Road Length ≤ 300 ft.	12	15	18

Results

A majority of stakeholders supported an increase in the maximum road grade for Class 1 roadways. There was recognition that the maximum road grade standard needs to consider access needs for emergency vehicles and the winter conditions experienced in Maine. Based on feedback received at Stakeholder Meeting Four, there was general support from the group to advance the proposed option for revising the LUPC Class 1 roadway standard as presented at the meeting.

Next Steps

Chapter 10, Section 10.25,D, Vehicle Circulation, Access and Parking, establishes the requirements for subdivision and development roadway design specifications. After considering the stakeholder feedback from Meeting Three and Meeting Four, LUPC staff has developed a proposed rule revision for Section 10.25,D that will be presented along with this report to the Commission for its consideration. A copy of the proposed rule revision is included in Appendix D.

The proposed rule revision has been developed using a model similar to that used by the Town of Bethel and several fire codes from western states. The revision includes an option, when achieving a maximum sustained grade of 10% is not practical, to allow an increase in the maximum grade of a Class 1 roadway to 15% for distances less than 300 feet. The increase in grade cannot be located close to an intersection to address safety concerns.

SUBDIVISION LAYOUT AND DESIGN

Background

The subdivision layout and design topic area was divided into four subtopic areas for initial discussion with the stakeholder group. The four subtopics included: development on steep slopes, use of appropriate building material, aligning LUPC standards with the DEP, and calculating total phosphorus loading from road construction. Research done on the subtopic areas included review of existing LUPC regulatory standards, DEP regulations, and the State's phosphorus control methodology. LUPC staff also discussed the phosphorus control methodology with Jeff Dennis of the Maine DEP. One high priority issue relating to subdivision layout and design was not addressed in this process, the issue of road crossing standards such as bridges and culverts. The LUPC road crossing standards are not limited to subdivision development and have wide ranging implications. For these reasons, the LUPC decided to address this issue at a later time, for all road crossing projects.

Development on steep slopes: Existing LUPC rules include two places where subdivision development on steep slopes is addressed. Under the subdivision layout and design standards, the rules require that building envelopes be located, where practicable, to avoid slopes >15%. Also, under the cluster development standards, areas with slopes greater than 15% are included as unbuildable land. Limiting development on steep slopes serves several purposes including:

- Minimizing water quality impacts from soil erosion and inadequate stormwater management
- Ensuring long-term structural stability
- Minimizing visual impacts
- Ensuring safe access for emergency vehicles

Use of appropriate building materials: For use of appropriate building materials, the LUPC rules currently have a standard on scenic character. That standard requires all structures be designed to minimize their visual impact on the surrounding area. Requiring structural design to minimize visual impact can be interpreted such that appropriate building materials may be used as an option to fit the structure harmoniously into the existing scenic character of the area.

Consistency with DEP standards: The DEP's standards for subdivisions are included in a set of rules adopted pursuant to the Site Location of Development Act. Although standards are included in these rules to ensure subdivisions have no unreasonable adverse environmental effect, they do not include specific layout

and design requirements. LUPC staff were not clear on the intent of this recommendation, and requested additional feedback from the stakeholder group.

Phosphorus calculations: Lastly, there was a concern raised in the stakeholder group about the method used to calculate phosphorus loading from road construction. LUPC staff discussed this concern with Jeff Denis of the ME DEP. Jeff explained that applying the phosphorus control methodology in the UT can be problematic, especially when development is proposed on a large lot that may be used for future timber harvesting. The methodology allocates phosphorus loading on a per acre basis in a lake watershed. Typically, a development is allowed to use the entire allocation for the parcel. However, if a development on a large lot uses the entire allocation, and further activity occurs on the parcel, such as land management road construction, the parcel could contribute more loading than allocated which could result in a decline in water quality. Several options are available to the landowner to address the concern, including options to control more phosphorus loading from the development, use of best management practices on existing land management roads, or removing existing land management roads that are no longer in use.

Results

Development on steep slopes: many of the stakeholders expressed support for changing the references to slope in the LUPC rules for building envelopes and unbuildable land in cluster developments from 15% to 20%. The recommendation for 20% would be consistent with the Maine Plumbing Code which limits construction of subsurface wastewater disposal systems to slopes less than 20%. There were also suggestions to use site specific analysis instead of a general standard when determining if a slope is appropriate for subdivision development. The group recommended additional research on municipal standards, but also concluded that allowing development of subdivisions on steeper slopes was not a high priority.

Use of appropriate building materials: the stakeholder group felt that the existing LUPC standard for scenic character is sufficient and did not recommend adding language in rule to clarify that one way of meeting the standard could be the use of appropriate building materials. However, there was support for the development of a guidance document or application instructions with examples of methods to assist landowners in meeting the scenic character standard. One comment suggested using exclusions, such as avoiding the use of reflective materials, instead of trying to cover all types of building materials that are appropriate. Additional guidance would improve predictability.

Consistency with DEP standards: additional discussion on the recommendation to improve consistency of LUPC subdivision standards with the DEP did not result in many suggestions from the stakeholder group. During Meeting Four, the only feedback on this subtopic related to being more consistent in terms of the number of lots in a Level 2 subdivision with the DEP definition of a subdivision. Currently an LUPC Level 2 subdivision can go up to 15 lots. However, a subdivision that is 15 or more lots and 30 or more acres in size triggers the DEP subdivision threshold and requires a DEP Site Law permit. The suggestion was for a Level 2 subdivision to be limited to 14 lots.

Phosphorus calculations: It appears the initial research into phosphorus loading calculations didn't capture the entire concern for this topic area. Discussion during Meeting Four focused more on the use of the phosphorus control methodology for small subdivisions, and how the calculations are applied, in general, to a small project on a large parcel of land. A question was raised as to whether the DEP reviews the entire parcel for large landholdings or just the proposed develop area. More research was recommended on this subtopic.

Additional research

Development on steep slopes: Additional research was done to review municipal standards for development on steep slopes. LUPC staff reviewed the State Model Subdivision Regulations. The only relevant recommendations pertaining to slope were found in the standards for cluster development. The Model recommends a basic standard for cluster development that no building be sited on slopes steeper than 25%, and that the net residential acreage be calculated subtracting slopes greater than 20%. Staff also looked at the ordinances for several communities located in different regions of the State. Basic standards for cluster developments similar to the Model were found in the ordinances for the Towns of Levant and Rockland. The basic standards for clustered lots in Skowhegan exclude slopes exceeding 25% when calculating buildable area. The Towns of Bethel and Rumford have open space subdivision standards that include a calculation for allowable density and locations for building envelopes, that cannot include areas of two or more contiguous acres with sustained slopes of 20% or greater, and Bethel's soil erosion control standard gives particular attention to slopes greater than 20%. The Town of Dover-Foxcroft has basic standards for conservation development subdivisions that include a calculation for the net residential acreage that does not include areas with slopes greater than 15%. It was also noted during this review that the State Shoreland Zoning Guidelines recommend all areas of 2 or more contiguous acres with slopes of 20% or greater in the shoreland zone be included in a resource protection district. Although municipalities use a range between 15% to 30% to define "steep" slopes for varies purposes in their ordinances, the most common, based on the limited research done, appears to be 20%.

Phosphorus calculations: LUPC had a follow-up discussion with Jeff Dennis of the Maine DEP. In general, Jeff agreed that for small, discreet projects on large parcels, one option is to apply the phosphorus control methodology and the appropriate phosphorus allocation to the proposed developed area instead of the entire parcel. However, in cases where the development involves a long access road across a large parcel, the proposed developed area may not be sufficient in size to accommodate the best management practices needed to address phosphorus loading from the road. Other options for controlling phosphorus, as discussed above, and additional land area may need to be included in the review to address situations where a long access road is planned to reach the subdivision.

Stakeholders asked the LUPC to look at options for small projects to meet the phosphorus control standard without the need to do phosphorus calculations. Research included existing LUPC standards, the State Model Subdivision Regulation, and, following the discussion with Jeff Dennis, the DEP general standards for stormwater management. The results of the research on this request are as follows:

- Current LUPC standards apply to all subdivisions and require.
  - Provisions be made to limit the export of phosphorus from the site.
  - The phosphorus impact of a proposed subdivision be calculated using the Standard Method for Calculating Phosphorus Export, according to the procedures in the Phosphorus Control Guide.

- The Maine Model Subdivision Regulation recommends:
  - The following standard: long-term cumulative effects of the proposed subdivision will not unreasonably increase a great pond's phosphorus concentration during the construction phase and life of the proposed subdivision.
  - A submission requirement for: a phosphorus impact analysis and control plan conducted using the procedures set forth in the DEP Phosphorus Design Manual, Volume II of the Maine Stormwater Best Management Practices Manual, 2006, including all worksheets, engineering calculations, and construction specifications and diagrams for control measures, as required by the Technical Guide.

- Under DEP Stormwater Management Rules, 06-096 CMR 500, projects that include less than 3 acres of impervious area and less than 5 acres of developed area may choose to meet the basic and general standards for stormwater management rather than the phosphorus standard if the project is not on a lake that is severely blooming. A copy of excerpts from these rules is attached as Appendix E.

Next Steps

Steep slopes: The subdivision layout and design, and cluster development standards are being reviewed under the policy issues for the subdivision rule review process. Given that changes may also be made pursuant to the policy issue review, any specific rule revisions for technical issues relating to layout and design and cluster development are dependent on the results of the policy review. Therefore, depending on the final format of any other proposed revisions to the layout and design, and cluster development standards, the following revised standards have been developed as possible recommendations for the Commission's consideration on steep slopes:

- Section 10.25,Q,3,d,(3)-Where practicable, building envelopes shall be arranged so as to avoid the placement of structures and driveways along ridge lines, on agricultural land, wetlands, slopes greater than ~~15~~ 20%, or any other important topographic and natural features.

- Section 10.25,R,2,a,(1),(b)- Unbuildable land which includes, without limitation, land that has a low or very low soil potential rating, in accordance with Section 10.25,G, or contains sensitive areas such as slopes exceeding ~~15~~ 20%, water bodies or wetlands.

- Section 10.25,R,2,a,(2),(c)- Contains land area at least 40,000 contiguous square feet in size that is not comprised of sensitive areas such as slopes exceeding ~~15~~ 20%, water bodies or wetlands.

Use of appropriate building materials: Based on the results of stakeholder discussions, no rule revisions are recommended for this subtopic area. The LUPC should consider development of guidance, preferably as additional instructions in the subdivision application form, to provide assistance to applicants in addressing the existing scenic character standard.

Align standards with DEP: As part of the subdivision rule review process, all of the criteria for Level II subdivisions are being reviewed as a matter of policy, including the criteria relating to the size of Level II subdivisions. Therefore, this subtopic area has been referred for resolution as a policy issue.

Phosphorus calculations: Chapter 10, Section 10.25,L, Phosphorus Control establishes the standards for subdivision and development projects to limit the export of phosphorus from each project site. After considering the stakeholder feedback from the Stakeholder Meetings Four and discussions with Jeff Dennis of the ME DEP, LUPC staff have developed a proposed rule revision for Section 10.25,L that will be presented along with this report to the Commission for its consideration. A copy of the proposed rule revision is included in Appendix D.

This proposed rule revision, as currently drafted, will provide a couple of performance standard based options for small projects to address phosphorus control without having to do detailed phosphorus calculations. First, by updating the reference to the Phosphorus Design Manual, a chapter currently in the Manual becomes available to landowners in the UT, "Chapter 6, Performance Standards for Smaller Projects". In addition, the proposed rule contains an alternative buffer standard that is similar to the DEP's stormwater general standards, allowing buffers that meet DEP design guidelines to be used in place of a site specific design. The current Phosphorus Design Manual can be found on the DEP's website: http://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html

APPLICATION PROCESS

Background

Two subtopic areas were initially researched and discussed under application process- the recommendation for requiring a mandatory pre-application conference, and allowing applicants for small subdivision projects to submit less information. Research included existing LUPC pre-application meeting guidance, existing LUPC requirements for subdivision permit applications, the subdivision submission requirements for several Maine municipalities, and recommendations for subdivision submissions in the State Model Subdivision Regulations. The detailed background information for Meeting Three includes a copy of the LUPC subdivision application and a table comparing the application submission requirements identified in the research. One high priority technical issue on application process was not included in the discussion of technical issues, which was a recommendation to establish a process for submitting subdivision plans on a phased basis. Although establishing a process for phased development has technical aspects, there were also policy issues associated with phased development. LUPC staff felt the policy issues should be addressed first. Follow-up on the technical issue will be needed, once recommendations on the policy issues are finalized.

The LUPC does not currently require pre-application meetings for subdivisions. However, the current LUPC subdivision permit application strongly recommends requesting a pre-application meeting prior to submission of the application. The recommendation is included in the middle of the first page of the form and is highlighted, drawing the reader's attention. Anecdotal research on this subtopic area indicates that pre-application meetings are held on a majority of the subdivision applications submitted to the Commission. In fact, most agency staff contacted could not recall a subdivision application that did not have a pre-application meeting before submission. Typical pre-application meeting materials include: a topographic map showing the location of the proposed project, a brief project description, and a copy of the LUPC Land Use Guidance Map for the project site.

The research on subdivision application requirements focused on several municipalities that the LUPC identified as having a minor and major subdivision application process. The intent of the comparative review was to see what submission requirements and process differences municipalities have adopted for small versus large subdivisions. For those municipalities reviewed, the research showed little difference in the submission requirements for minor and major subdivisions. The process for the two types of subdivisions differed mostly in the number of meetings required. Generally, fewer meetings are required for minor subdivisions than for major subdivisions in these municipalities.

Results

In terms of requiring a mandatory pre-application meeting for subdivision applications, there was strong support in the group for leaving the process the way it is. It seems to be working with most applicants having pre-application meetings prior to submission. Stakeholders commented that, in general, LUPC staff should request the information they believe is necessary in advance of a pre-application meeting. However there was one comment that use of a topographic map is outdated. If the LUPC develops a process for conservation subdivisions, it was noted that the inventory of high value resources should be included in the submissions for a pre-application meeting.

The LUPC asked stakeholders what changes the agency should consider making in the type of information currently required in the subdivision permit application. Overall, the group did not identify any specific changes that they would like to see in the application. The stakeholders recommended the LUPC conduct additional research seeking input from staff on what is currently required for application submissions including whether additional information is needed for review of subdivisions, whether there are any

common stumbling blocks or deficiencies in subdivision applications, and whether there have been any common gaps in data on subdivisions. Specifically in terms of small subdivisions, stakeholders asked if traffic analyses and archeological studies could be eliminated. A traffic analysis is only required for subdivisions that generate a significant amount of traffic or involve a specific safety concern; and therefore, is not a typical requirement for a small subdivision. An archaeological study is only required if the project site includes an archaeological sensitive area or structure listed in the National Register of Historic Places, or is considered by the Maine Historic Preservation Commission (MHPC) as to likely contain a significant archaeological site or structure. There was concern expressed about what criteria is used by the Maine Historic Preservation Commission to identify a likely archaeological site or structure. The LUPC agreed to follow-up with the MHPC.

Additional research

A survey of staff was conducted to gather information on whether the LUPC subdivision permit application form should be revised to address any common deficiencies or gaps. Given the relatively low number of subdivision applications reviewed in the past few years, LUPC staff does not have extensive experience with the form since its last update. However, several issues were identified, including a need for additional information to document that the proposed layout and design of the subdivision meets the Commission's requirements and improved clarity on 1) what is meant by lot size, in question #3, 2) what should be included in the building envelope for each lot, 3) what sections of the CLUP should be addressed for question #17, 4) whether notices of filing for Exhibit I should be sent by certified mail, 4) whether right, title, or interest has to be addressed for the mainland boat launching and parking areas providing access to water access only subdivisions, 5) what evidence is acceptable for financial capacity in Exhibit J, and 6) how the additional notice provision in Exhibit X applies to lot owners within a subdivision.

According to the website Maine IS Technology, Volume V, Issue 5, May 2002, Archaeology, History and GIS, "Along with the presence of known cultural resources,… areas which are considered sensitive for prehistoric archaeology have been mapped based upon the presence of well-drained sandy soils and water features accessible by canoe. Sensitivity for historic resources is often determined with the use of historic maps that depict early settlement. Historically sensitive areas most often correspond with the placement of old roads and trails as well as millstreams and ponds." More specific information on the method that MHPC uses to identify areas of potential prehistoric archaeological significance is provided in the report "A Heritage for the Future: Maine's Statewide Historic Preservation Plan," Fourth Edition, Maine Historic Preservation Commission, 2011 (the Plan). Excerpts of this report are included as Appendix F. The MHPC uses a predictive model for habitation/ workshop sites in their Review and Compliance project reviews. This model focuses on shorelines of water bodies that are navigable by canoe and well-drained, sandy glacial outwash soils with an additional factor such as topographic relief or presence of a stream. According to the Plan, this model has been tested numerous times with a high degree of success. For the 13,200 reviews done by the MHPC between 2000 and 2004, the Plan reports that 400 archaeological surveys were requested, with 110 Phase I reports submitted in response, and a total of 88 archaeological sites being located by the Phase I surveys. Based on their experience, the MHPC does not plan to make any changes to the model in the near future.

Next steps

For this topic area, the stakeholder group has not recommended any specific changes that would require revisions to the LUPC subdivision rules. As the Subdivision Rule Review process reaches completion, it is likely that changes in the current subdivision permit application will be needed to align the form with any adopted rule revisions. The concerns identified by LUPC staff during the additional research survey should be addressed, and any additional stakeholder input should be considered in an application update as part of the process.

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix A

Master Issues List
October 2014

Subdivision Rule Review
Master Issues List
October 2014

The Commission distributed a written survey to a small group of stakeholders in April of 2014 to determine what issues may be raised during a review of the rules governing subdivision development in the unorganized territories. In September of 2014, the Commission posted an online survey reaching out to a larger group of stakeholders for input on what improvements are needed to its subdivision rules. The results of these surveys, together with information gathered in a workshop held by the Commission in October of 2014, have been consolidated in this master issues list. Further refinements to this list are expected as the process moves forward.

The issues identified to date have been organized into two categories: broader policy issues and more detailed technical/ procedural issues, as outlined below. It is important to note that some issues identified in the process so far may not be represented on this list. These issues were not included because they related to statutory requirements that cannot be changed in a regulatory proceeding, were not related directly to the Commission's subdivision requirements, or have been or would be better addressed in a separate regulatory review process such as issues relating to natural resource protection standards. All comments submitted in the surveys and the workshop will be kept on file and considered as appropriate in future Land Use Planning Commission proceedings.

At the first stakeholder meeting in Brewer on October 29th, the participants will: look at the list of issues; see if anything needs to be added to it; refine the issues as necessary; and establish priorities for addressing them.

Technical/ Procedural Issues

Motor Vehicle Circulation, Access Management and Parking Area Layout

- Should the Commission establish a minimum per lot parking space requirement for subdivisions?

Road Design and Construction

- What changes to the standards are needed, if any, to ensure safety for emergency vehicles, school buses and pedestrians?
- Should the road standards be revised to allow a maximum sustained grade for a class 1 road of 12% instead of the current 10%?
- Should provisions for snow removal be required?
- Should MDOT be more involved in review of subdivision road designs?
- What changes are needed to improve the current road crossing standards?

Subdivision Layout and Design

- Can development be allowed on steeper slopes with adequate provisions for erosion control?
- What standards need to be revised or added to allow for sufficient clearing of defensible space around homes for fire safety?
- Are standards needed regarding placement of utilities, above or below ground?
- What standards are needed to ensure the appropriate use of building materials so that dwellings fit harmoniously with the existing environment?
- Should the vegetation clearing standards be revised to allow reduced buffer strips along roadways or reduce other clearing limitations?
- Should there be additional standards to address vegetative clearing for hillside development?
- What standards need to be revised to improve consistency with DEP subdivision standards?
- Should setbacks from internal roads be reduced?

Title, Right and Interest

- How should the commission review TRI?

Common Infrastructure Maintenance

- What steps should be taken to ensure better long-term maintenance of common infrastructure?

Process for the Preparation, Submission, and Review of an Application

- Should the pre-application process include a mandatory pre-application meeting between LUPC staff and the property owner or developer and his/her representatives?
- If so, who should attend the pre-application meeting - just LUPC staff or other agency staff that may be involved in the review?
- What level of site inventory and analysis should be required for the pre-application meeting and for the application process?
- Should there be a process for an applicant to submit a conceptual plan for the entire subdivision and get detailed approvals on a phased basis?
- If so, what information is needed for a meaningful conceptual plan?
- What changes to public notice provisions are needed to ensure adequate public participation?
- Should small (e.g. 5 or less lots) be allowed to submit less information or less detailed information as part of the application and if so, what information can be omitted?
- What level of soil survey should be required for subdivisions?
- Is one test pit per lot sufficient to review the adequacy of soils on subdivision lots for the long-term?
- Can the Commission develop and maintain a database of road ownership?
- Should the Commission have a role in improving communication between E911 Addressing Officers and subdivision developers?
- What is the best way to help applicants anticipate review time?
- Should annual reports of progress be required as a condition of subdivision approval?
- Would more follow-up inspections by Commission staff be beneficial?
- Should follow-up inspections by the design engineer be required?
- Should the Commission develop a certification process for design professionals?
- Is clarification needed for when a subdivision permit vests?

Policy Issues

Motor Vehicle Circulation, Access Management and Parking Area Layout

- What provisions for access management should be required for water access only subdivision lots?

Road Design and Construction

- How can the Commission's standards be revised to increase flexibility for internal subdivision road design in rural areas and for smaller subdivisions?
- Are multiple ingress /egress points needed for emergency access?

Level 2 Subdivision Standards

- Would revised standards for Level 2 subdivisions create more beneficial development without causing undue adverse impact?
- How can more Level 2 subdivisions be encouraged in areas already approved for this use?
- Are there additional areas of the UT where Level 2 subdivisions should be allowed? If so, which ones?
- What is the appropriate number and size of lots for Level 2 subdivisions?

- ✦ Should the Level 2 criteria in 10.25,Q,2,c and d, relating to distance from public roads and to location near compatible development, be changed?

Subdivision Layout and Design

- ✦ Are the layout and design standards for subdivisions appropriate for the areas served by the Commission?
- ✦ Should the standards allow for more design options for different areas/ regions of the UT (waterfront vs. back lots, hillside properties, developed vs. rural areas, etc.)?
- ✦ How can the standards be made clearer while incorporating more flexibility?
- ✦ Where should community-centered design or grouping of lots be required?
- ✦ Should back lots or shared water frontage be encouraged or required?
- ✦ Are there places or situations where the linear placement of lots should be allowed? If so, where?
- ✦ Should the standards be revised to allow the creation of large lot subdivisions to meet market demand?
- ✦ If yes, what standards should apply to large lot subdivisions and where should they be allowed?
- ✦ Where should shared access roads or driveway access be required?
- ✦ Should the Commission encourage sharing of temporary docks for water access in subdivisions?
- ✦ Does the Commission need standards that consider cumulative impact and carrying capacity in its review of subdivisions?
- ✦ Are special considerations needed for condominium developments?

Cluster Subdivision Standards

- ✦ Where should clustering of subdivision lots be required and where should it be incentivized?
- ✦ Should clustering be discouraged in certain areas /regions of the UT? If so, where?
- ✦ Where clustering is used, how should the method for calculating the amount of required open space, currently calculated as 50% of the net developable land, be revised?
- ✦ Should the provisions for waiving dimensional requirements be expressed or calculated in a different way?

Open Space Standards

- ✦ Where should open space be required, and could off-site preservation be an appropriate substitute?
- ✦ What revisions are needed to the mechanism by which holders of open space assume control or assist in management of these lands?

Title, Right or Interest

- ✦ Should an applicant be required to demonstrate a legal right to use the proposed access to the subdivision if it is not directly from a public road or recorded public easement?

Incentive-based Standards

- ✦ Are there ways to create incentive-based standards that would be beneficial?

Common Infrastructure Maintenance

- ✦ Should performance guarantees be required for certain subdivision projects?

Process for the Preparation, Submission, and Review of an Application

- ✦ What improvements can be made to reduce the cost and processing time for subdivision permits?
- ✦ What changes are needed to improve the permit amendment process for changes that occur during construction?
- ✦ Should the Commission play a role in use of impact fees?

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix B

Technical Issues Tabulation Sheet
Feedback from Meetings #3 and #4

LUPC Subdivision Rule Review
Technical Issues
Feedback from Meeting #3 #4

SOIL INVESTIGATION AND MAPPING

1. Should the intensity of the soil survey for a subdivision be determined on the basis of developed vs. undeveloped area, density, or a combination option?

Initial Responses	Additional Discussion and Comments
Intensity should be up to the landowner, soil scientist, or design engineer	
Intensity should be based on site characteristics not development or density	
Highest intensity surveys should be done at the building permit stage	
Need higher intensity for road placement, siting building envelopes	
Proximity to sensitive areas should be considered	
NRCS mapping is more accurate and field verified now, should be used more	Questions about accuracy/limitations, especially for higher level planning purposes
NRCS and wetland map should be used for rezoning purposes	
Boundaries on NRCS maps are pretty good	
Using NRCS mapping, the only assumption you can make is areas with medium to high potential will be suitable	Map units with unsuitable soils included will be conservatively listed as LDD, or VLDD, even if 49% suitable
Class A is not necessary for residential development	
Class B sufficient for road placement and building envelopes	Published soils on other areas
DEP waives soil survey if geotech survey done for structures, roads	
Use higher intensity if soil limitations shown on NRCS map	
Include waiver provisions for soil mapping	When wetlands map available, well-drained soils; not with shallow, wet, steep slopes or close to waterbody
Use NRCS map for undeveloped areas, but have field verified by C.S.S. (Class C)	
Need admin appeal process if staff asking for more than necessary on a project	
LUPC rules should be as consistent with DEP rules as possible	
For large lots, only need to show there is a building lot w/ adequate soils	
Lee Burman and Steve Howell presented a proposal, trigger for Class B- 14 lots	
General support for proposal submitted by Lee Burman and Steve Howell	With an exception on Level II subdivision testpits
Group would like to see proposal in writing before finalizing	

2. In what type of project or area within a project should Class C or D soils surveys be allowed?

Initial Responses	Additional Discussion and Comments
Use NRCS map for undeveloped areas, but have field verified by C.S.S. (Class C)	

3. Which of the options for consideration would work best for the UT?

Initial Responses	Additional Discussion and Comments
Plumbing code requires 1 test pit	
LUPC should adopt DEP model	
DEP criteria have been in place for some time, make sense	
Reasonable to ask for more test pits where limitations exist	
Test pits don't take a lot of time	More information at low addtl cost
Documentation required by DEP should be modified, its overkill	Test pit summary log and one soil description is sufficent. Soil description isn't needed for every test pit
2 per lot is common municipal standard	More research on this should be done

LUPC Subdivision Rule Review
Technical Issues
Feedback from Meeting #3 #4

Proposal from Lee and Steve includes 2 testpits/ lot for <15 lots One per lot unless restrictions are found- generally supported by group	1 testpit and a probe an option?
4. If number of test pits reduced to one, in what situations would requiring a written certification by C.S.S. provide a resonable alternative?	
Initial Responses	Additional Discussion and Comments
Any certification has to be done by site evaluator not C.S.S. Code requires site evaluator to verify that soil area is sufficient for dispoal bed Stamped site evaluation is guarantee that soils are sufficent in area	
5. What soil conditions or designs would necessitate additional test pits to ensure there are adequate soils to accommodate the disposal bed?	
Initial Responses	Additional Discussion and Comments
LUPC should adopt DEP model	

LUPC Subdivision Rule Review
Technical Issues
Feedback from Meeting #3 #4

MAXIMUM ROAD GRADE	
1. Will the possible option under consideration for maximum road grade work for the UT and does it address the original issue identified?	
Initial Responses	Additional Discussion and Comments
Research should include fire code standards for northern states	
Should winter conditions of snow/ ice be considered	
A lot of places may be seasonal use only, but no guarantee	
Can require seasonal use by deed covenant	
Need to adjust standard for Maine's climate conditions	
Should "Code of the West" like document be created	Notify new owners what life is like in remote areas
Look to see if Carrabasett Valley has standards for road construction	
Road standard should at least consider fire code requirements	
Makes more sense to design for fire code requirements near service centers	Remote areas will likely be too far, fire trucks won't reach the area in time anyway

LAYOUT AND DESIGN

1. What changes should be made to the Commission's rules to ensure appropriate review and development of subdivisions on steeper slopes?

Initial Responses	Additional Discussion and Comments
Locate building envelop <20% slope, mirror plumbing code	
Does the length of slope matter	
How far up the slope do you go, esp. considering visual impacts	
Some steep slopes look out over wind projects	Matter of fairness to not restrict the hillside development based on slope
Any limitations should be site specific, not a general standard	
Steeper slopes lend themselves to site analysis subdivision	Performance stds
Research municipal standards	
This is not a high priority issue for the group	

2. Is the concern about development on steeper slopes related mostly to cluster developments where steep slopes are included as unbuildable land?

Initial Responses	Additional Discussion and Comments
Make consistent with plumbing code or std selected under Q1	
Additional research on municipal standards should be completed	

3. Should the standard for cluster development be changed so that land is considered buildable until it exceeds a slope of 20%?

Initial Responses	Additional Discussion and Comments
See above.	

4. Should the LUPC Scenic Character standard be clarified to specifically require the use of appropriate building materials?

Initial Responses	Additional Discussion and Comments
Existing standard is sufficient	
Should building materials be specified in rule?	
Accomplish with a guidance document or	
instructions or examples in the application- generally supported	Concrete suggestions on how an applicant can address this issue
Deserves further thought- height restrictions, other exclusions	

Predictability would be helpful	
5. Alternatively, is a standard for use of appropriate building materials that specifically applies to lot development in subdivisions needed?	
Initial Responses	Additional Discussion and Comments
Guidance with examples/illustrations rather than prescribed standards Standard to exclude clearly inappropriate materials/colors, focus on exclusions	
6. In what way(s) should the LUPC standards for subdivision be more consistent with the DEP?	
Initial Responses	Additional Discussion and Comments
14/15 lot definition	
7. How can the LUPC make sure that phosphorus exports from development and timber harvesting operations occurring on the same parcel do not exceed the phosphorus allocation for the lake and potentially cause a decline in lake water quality?	
Initial Responses	Additional Discussion and Comments
Establish thresholds before full calculations are required for a subdivision It is not hard to do calcs for a small project Further research with DEP needed Review development area vs. entire parcel for large landholdings? Different standards for large lots? Different standards for backlots?	How to protect against ownership change and parcelization? Future impacts?

APPLICATION PROCESS

3. What type of additional information should be requested in advance of a pre-application meeting?
The LUPC currently requires a location map, a project description, and a copy of the Land Use Guidance Map.

Initial Responses	Additional Discussion and Comments
In terms of mandatory pre-apps, strong support for leaving as is	
What ever the LUPC staff think they need	Topo map is outdated
For conservation subdivisions, the location/inventory of high value resources	

4. What changes should the LUPC consider making in the type of information currently required in the Application for Subdivision Permit for all projects?

Initial Responses	Additional Discussion and Comments
List from staff based on materials currently required / other needs?	
Seek feedback from applicants and staff as to stumbling blocks and gaps	
Staff list of common deficiencies	

5. Which submissions currently required in the Application for Subdivision Permit should the Commission waive for smaller subdivisions?

Initial Responses	Additional Discussion and Comments
Should traffic analysis be eliminated	Not manditory, case-by-case review
What about an archeological study?	Based on MHPC screening, MHPC errs on the side of caution
Seven Islands- recent study cost $5,600	A lot of investment for sites that are unlikely be significant
LUPC should discuss criteria for an archeological study with MHPC	

6. What information, if any, should be requested for subdivision projects that is not currently required by the LUPC?

Initial Responses	Additional Discussion and Comments
Staff should be asked about what they need in the application	

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix C

Letter submitted to the LUPC by Burman Land & Tree Company, LLC, dated March 23, 2015, regarding LUPC subdivision rule review comments from Meeting Three

BURMAN
LAND & TREE COMPANY, LLC.

P.O. Box 145, Orrington, Maine 04474 (207) 825-4050

March 23, 2015

Maine Land Use Planning Commission
Attention: Samantha Horne-Olsen
22 State House Station
Augusta, ME 04330

Subject: LUPC Subdivision Rule Review Comments from Meeting Three

Dear Ms. Horn-Olsen,

This letter is to provide comments to the Maine Land Use Planning Commission (LUPC) regarding proposed changes to the Subdivision Rule and information presented during the stakeholders meetings. As a consulting soil and wetland scientist who assists clients through the LUPC permitting process regarding natural resources, I am most interested in proposed changes to the soil investigation and mapping portion of the rule changes. This letter includes input from Stephen H. Howell, Certified Soil Scientist, as well.

During the third stakeholders meeting we were asked to comment on the soil investigation and mapping section, specifically, our opinions as to how LUPC should model their regulations regarding when a soil survey should be required and what type should be required in what instance, i.e. by subdivision type (LUPC's current method), by lot size (Maine Department of Environmental Protection's (MDEP) current method), or by following a model used in some municipalities. As stated in the meeting, it is my opinion that the rules could take certain aspects from all three of the regulations/models.

The following are my suggestions for changes to the soil survey requirements as they pertain to LUPC Subdivisions:

William H. Burman
Licensed Professional Forester
Master Arborist
Master Pesticide Applicator

Aleita M. Burman
Certified Wetland Scientist
Certified Soil Scientist
Licensed Site Evaluator

1. NRCS soil surveys[1] are appropriate for zoning change petition reviews, without independent soil scientist mapping;

2. NRCS soil surveys are also appropriate for LUPC Level 2 subdivision review (whereas it is assumed that the Level 1/Level 2 Subdivision threshold will be changed to follow MDEP rules in that Level 1 Subdivisions will meet the same triggers as the MDEP "subdivision" definition in the Site Location of Development Act (Site Law) and Level 2 are all subdivisions that do not meet Level 1 criteria). Unless a specific municipality requires it, a soil survey by a soil scientist is generally not required for those subdivisions that do not trigger MDEP Site Law, in MDEP jurisdiction;

3. Level 1 Subdivision review should include a Class B High Intensity Soil Survey by a Maine Certified Soil Scientist in the development areas (building envelopes, driveways and roads) and allow published soil mapping in the remainder of the property. An exception to the soil survey requirement in Level 1 Subdivisions should be allowed in the case that a geotechnical investigation is conducted, where the higher level of investigation has been conducted specifically for the proposed development;

4. An exception could be that any Level 2 Subdivision that is greater than 5 lots is required to have field verification of the NRCS published mapping by a Maine Certified Soil Scientist.

At the meeting, we were also asked to review the soil site evaluation (septic system) requirements. The following are my suggestions for changes to the soil site evaluation requirements as they pertain to LUPC Subdivisions:

1. Level 1 Subdivisions should be required to meet Section 17 of the Site Law regarding number of test pits for septic evaluation (this is of similar or greater intensity as a Class A High Intensity Soil Survey);

[1] The Natural Resources Conservation Service (NRCS) has completed updated soil survey mapping in Maine, with soil survey maps published and available on the NRCS website (http://websoilsurvey.nrcs.usda.gov/app/). These maps have been field verified and are a vast improvement over past federally published soil survey maps, generally meeting MAPSS Class C Medium High Intensity Soil Survey standards.

2. Level 2 subdivisions should have two suitable test pits per suitable area;

3. In their report, site evaluators should provide a completed Maine DEP Form E or an equivalent form. This form will include information verifying that the suitable area is of sufficient square footage for the proposed type of development (i.e. 4-bdr residential) and type of system (plastic chambers), in both Level 1 and Level 2 Subdivisions.

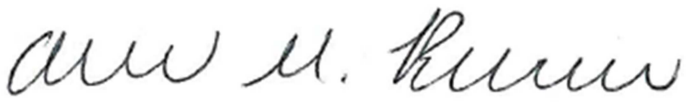
Please note that the licensing for soils scientists (who conduct soil surveys) and soil site evaluators (who conduct soil evaluations for septic systems and septic system design) are different. Soil surveys must be conducted by a Maine Certified Soil Scientist (C.S.S.). Soil site evaluation must be conducted by a Maine Licensed Site Evaluator (L.S.E.).

While the remainder of the proposed rule changes are interesting, I generally do not deal directly with most of them, nor feel that I have the planning background to make useful comment. However, I wanted to take a moment to applaud the LUPC in considering some of these changes, which appear to work towards streamlining the application process and making the rules more understandable. I appreciate very much the opportunity to be part of the stakeholders group.

Thank you for the opportunity to make comments on the proposed LUPC Subdivision Rule changes. Please contact me with any questions you have on my comments.

Respectfully Submitted,

Burman Land & Tree Company, LLC



Aleita M. Burman, C.W.S., C.S.S., L.S.E.

Office: (207) 825-4050
Mobile: (207) 385-6056
blburman@gmail.com

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix D

Proposed rule revisions:
Section 10.25,G. Soil Suitability
Section 10.25,D. Maximum Road Grade
Section 10.25,L. Phosphorus Control

G. SOIL SUITABILITY

The standards set forth below must be met for all subdivisions and commercial, industrial and other non-residential development.

1. Soil types shall be determined by a site-specific soil survey, according to the "Guidelines for Maine Certified Soil Scientists for Soil Identification and Mapping" (Maine Association of Professional Soil Scientists, ~~2004~~revised 2009). The soil survey class shall be determined as follows, unless the Commission finds that a lower or higher intensity soil survey class ~~is needed~~will provide the information necessary for the Commission's review:

a. For both level 1 and 2 subdivisions, a Class B high intensity soil survey shall be used to identify soils within the proposed building envelopes and other disturbed areas. The Class B survey for this purpose must be completed with a minimum delineation of 1 acre for similar soils and ¼ acre for dissimilar soils. For proposed access roads driveway locations and utility lines, a Class L soil survey shall be used. A Class C soil survey may be used to identify soils elsewhere within the project area.

b. For new commercial, industrial and other non-residential development, a Class A high intensity soil survey shall be used to identify soils within any proposed disturbed area. A Class C soil survey may be used to identify soils elsewhere within the project area.

c. For linear projects or project components that involve soil disturbance, such as road construction, fairway construction or trail construction and that have little or no adjacent development, a Class L soil survey shall be used.

d. Hydric soils and soils potential ratings. Hydric soil map units, and map units with a low or very low development potential rating for low density development must be clearly identified on the soil survey map as being hydric soils or having a low or very low development potential rating, respectively.

e. Waivers. The Commission may:

(1) Allow the use of U.S.D.A. Natural Resources Conservation Service (NRCS) Soil Survey published mapping in lieu of any Class C soil survey required in Sections 10.25,G,1,a through c when the published mapping indicates the map unit(s) in the project area is rated with a medium or high potential for low density development.

(2) Allow the use of NRCS Soil Survey published mapping in lieu of any Class C soil survey required in Sections 10.25,G,1,a-c for areas within a development that will be preserved as undeveloped open space in accordance with Section 10.25, S.

~~(1)~~(3) Waive a site-specific soil survey of any proposed disturbed area within a development where a geotechnical investigation has been prepared for that area by a registered professional engineer and other licensed professionals, as appropriate, and the Commission determines that the geotechnical report will provide sufficient information.

~~(2)~~(4) The Commission may waive one or more of the provisions of a Class A or B high intensity soil survey, including but not limited to the contour mapping requirement, where such provision is considered by the Commission unnecessary for its review.

2. Determination of soil suitability shall be based on the NRCS~~Natural Resources Conservation Service's~~ soils potential ratings for low density development. Soils with a low or very low development potential rating shall not be developed unless the Commission determines that adequate corrective measures will be used to overcome those limitations that resulted in a low or very low rating.

3. For all developments that include onsite subsurface wastewater disposal, a sufficient number of test pits must be provided within the footprints of all proposed wastewater disposal fields to adequately document that disposal fields can be installed entirely on soils and slopes in compliance with the Subsurface Wastewater Disposal Rules (10-144A CMR 241).

a. At least ~~two~~ one test pit~~s~~ shall be dug within the boundaries of each subdivision lot proposed to be served by a combined septic system. The applicant shall provide additional subsurface exploration data for certain soil conditions or disposal field designs, in accordance with the following requirements:

(1) Soil ~~-~~conditions AII and AIII (bedrock depth 9 inches to 24 inches). A minimum of five subsurface explorations: one test pit is to be centrally-located within each disposal field footprints, plus a subsurface exploration at each disposal field corner which may consist of either a test pit, boring, or probe.

(2) Soil with profile 8 or 9-parent material (lacustrine/marine deposits). A minimum of two test pits, one of which shall be in the area of the disposal field footprint where the most limiting condition is expected based on the best professional judgement of the Licensed Site Evaluator.

(3) Soil condition D (limiting factor depth less than 15 inches). A minimum of two test pits, one of which shall be in the area of the disposal field footprint where the most limiting condition is expected based on the best professional judgement of the Licensed Site Evaluator.

(4) Disposal field length of 60 feet or longer. A minimum of two test pits, one of which shall be in the area of the disposal field footprint where the most limiting condition is expected based on the best professional judgement of the Licensed Site Evaluator.

b. For lots to be served by primitive and limited disposal systems, evidence must be submitted to show there are suitable locations on the lot for a grey water disposal field, any proposed pit privy (outhouse), and a backup system reserve area as required by and in compliance with the Subsurface Wastewater Disposal Rules (10-144A CMR 241,4,I). At least one test pit shall be dug within the boundaries of each ~~lot proposed to be served by a primitive septic system~~proposed disposal area and the backup system reserve area on the lot.

~~**a.**~~**c.** The location of such test pits shall be shown on the subdivision plat.

D. VEHICULAR CIRCULATION, ACCESS AND PARKING

4. Subdivision and development roadway design specifications. The following standards apply to Level B and Level C road projects:

e. Roadways shall adhere to the applicable standards of Section 10.27,D and Section 10.27,H and the roadway specifications outlined in Table 10.25,D-1, below, unless the applicant utilizes site-specific best management practices and the Commission determines that proposed alternative roadway specifications will meet the needs of the development and will not cause erosion or safety problems.

Maximum sustained grade for Class 1 roadways may be increased by up to 5% over that specified in Table 10.25,D-1 below, if no other option is practicable, provided that the roadway portion exceeding the maximum sustained grade standard is no longer than 300 feet in length and is greater than 150 feet from the next down-hill road intersection, and the Commission determines that the proposed alternative grade will not cause unreasonable drainage, erosion or public safety impacts.

Table 10.25,D-1	Class 1 Roadway	Class 2 Roadway	Class 3 Roadway
Minimum roadway surface width	18 ft. or 14 ft. with turnouts every 500 feet, on average.	14 ft. or 8 ft. with turnouts every 500 feet, on average.	8 ft.
Minimum base (coarse gravel)	18 in.	12 in.	As needed.
Minimum wearing surface	3 in. fine gravel or 2.5 in. bituminous concrete.	3 in. fine gravel or 2.5 in. bituminous concrete.	2" fine gravel.
Maximum sustained grade	10%	15%	15%

Table 10.25,D-1. Roadway construction specifications.

L. PHOSPHORUS CONTROL

…

2. General Standards.

a. Provision shall be made to limit the export of phosphorus from the site following completion of the development or subdivision so that the project will not exceed the allowable per-acre phosphorus allocation for the water body, determined by the Commission according to the "Maine Stormwater Best Practices Manual, Volume II, Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development" (Maine Department of Environmental Protection, 2008), and hereafter cited as the Phosphorus ~~Control~~ Design ~~Guide~~Manual.

b. **Impact analysis.** The phosphorus impact analysis and control plan for~~of~~ a proposed subdivision or development on a water body shall be prepared using the procedures set forth in the ~~calculated using the Standard Method for Calculating Phosphorus Export, according to the procedures in the~~ Phosphorus ~~Control Guide~~Design Manual, including all worksheets, engineering calculations, and construction specifications and diagrams for control measures as may be required by the manual, except as allowed in Section 10.25,L,2,d, below.

c. **Erosion control.** All filling, grading, excavation or other similar activities that result in unstabilized soil conditions must meet the standards of Section 10.25,M.

d. **Alternative standard option.** In lieu of meeting the general standard in Section 10.25,L,2,a, and conducting a phosphorus impact analysis according to Section 10.25,L,2,b, an applicant with a project that includes less than three acres of impervious area and less than 5 acres of developed area in a watershed of a body of standing water that is not severely blooming (as identified in 06-096 CMR 502, Appendix A), may choose to limit the export of phosphorus from the site by meeting the alternative buffer standard in Section 10.25,L,3. For the purposes of Section 10.25,L,2,d, developed area means all disturbed area excluding area that within one calendar year of being disturbed is returned to a condition with the same drainage pattern that existed prior to the disturbance and is revegetated, provided the revegetated area is not mowed more than once per year, and including, in the case of a subdivision, all proposed building envelopes.

3. Alternative buffer standard.

a. To meet the alternative standard, a project must include treatment measures that will provide for effective treatment of phosphorus in stormwater. This must be achieved by using vegetated buffers to control runoff from no less than 95 percent of the impervious area and no less than 80 percent of the developed area that is impervious, landscaped or otherwise disturbed, except as provided in Section 10.25,L,3,d below.

b. **Vegetated buffers**. Vegetated buffers for phosphorus control are undisturbed strips of dense vegetation located adjacent to and down gradient of developed areas, and that provide storage and treatment for stormwater that enters them in diffuse overland flow. Five types of vegetated buffers are allowed under the alternative standard as listed in Section 10.25,L,3,b,(1) through (5) below. All vegetated buffers must be appropriately used, located, designed, sized, constructed, and maintained as specified in the "Maine Stormwater Best Practices Manual, Volume III. BMP Technical Design Manual, Chapter 5. Vegetated Buffers revised June 2010," (Maine Department of Environmental Protection), and hereafter cited as the Technical Design Manual. Where the Technical Design Manual allows for a variation in the design specification with approval from the Department of Environmental Protection, approval from the Land Use Planning Commission is required for projects located in the Commission's service area.

(1) Buffers adjacent to residential, largely pervious or small impervious areas.

(2) Buffers with stone bermed level lip spreaders.

(3) Buffers adjacent to the downhill side of a road.

(4) Ditch turn-out buffers.

(5) Buffers down gradient of a single family residential lot.

c. Deed restrictions and covenants. Areas designated as vegetated buffers must be clearly identified on the subdivision plat and plans, and protected from disturbance by deed restrictions and covenants.

d. Exception for linear portions of a project. For a linear portion(s) of a project, runoff control may be reduced to no less than 75 percent of the impervious area and no less than 50 percent of the developed area that is impervious, landscaped or otherwise disturbed.

~~3.~~4. **Design and Maintenance Standards.**

a. Phosphorus control measures and their maintenance shall meet the design criteria contained in the ~~Phosphorus Control Guide~~Technical Design Manual.

b. Structural measures. High maintenance structural measures, such as wet ponds and runoff infiltration systems, shall not be used as part of any proposed phosphorus control plan unless:

(1) Other measures, such as increasing the width of vegetated buffers, greater limits on clearing, reducing road lengths, and clustering of lots to achieve less disturbed area are clearly demonstrated to be insufficient to allow the proposed subdivision to meet the standards of this section; and

(2) The Commission finds that the applicant has the technical and financial capabilities to properly design, construct, and provide for the long-term inspection and maintenance of the facility in accordance with the procedures in the ~~Phosphorus Control Guide~~Technical Design Manual.

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix E

Excerpts from DEP Rules,
Chapter 500: Stormwater Management

LUPC Subdivision Rule Review

Technical Issues

Excerpts from DEP Rules, Chapter 500

Stormwater Management

Z. Two (ten, twenty-five)-year, 24-hour storm. A precipitation event with a 50% (for two-year), 10% (for ten-year), or 4% (for 25-year) probability of being equaled or exceeded during any twenty-four hour period during any given year.

AA. Watershed. The land area that drains, via overland flow, drainageways, waterbodies, or wetlands to a given waterbody or wetland.

BB. Wetlands. Coastal and freshwater wetlands as defined in the Natural Resources Protection Act, 38 M.R.S.A. §480-B.

4. Stormwater standards. This section describes the stormwater standards that apply to a project disturbing one acre or more, or to a modification of any size as described in Section 16 of this chapter. There are six categories of stormwater standards: basic, general, phosphorus, flooding, urban impaired stream, and other. More than one standard may apply to a project. In this situation, the stricter standard is applied as determined by the department. For example, a project may be located in a stream watershed, and the stream may drain to a lake. The standards for the particular stream and lake are compared, and the stricter standard is applied as determined by the department.

A. Basic standards

(1) When the basic standards must be met. A project disturbing one acre or more must meet the basic standards. Basic standards are specified in Appendices A, B, and C of this chapter and address erosion and sedimentation control, inspection and maintenance, and housekeeping, respectively.

A project qualifies for a stormwater permit by rule (PBR) described in Section 6, and therefore need only meet basic standards, if it results in one or more acres of disturbed area and the following.

(a) Lakes most at risk and urban impaired streams. Less than 20,000 square feet of impervious area and 5 acres of developed area in the direct watershed of a lake most at risk or urban impaired stream; and

(b) All other watersheds. Less than one acre of impervious area and five acres of developed area in any other watershed.

(2) Grading or other construction activity. Grading or other construction activity on any site disturbing one acre or more may not impede or otherwise alter drainageways to have an unreasonable adverse impact on a protected natural resource.

B. General standards. General standards apply as described below in addition to the basic standards described in Section 4(A).

(1) When general standards must be met. A project disturbing one acre or more and resulting in any of the following must meet the general standards described below in Section (4)(B)(2).

(a) Urban impaired streams. 20,000 square feet or more of impervious area, or 5 acres or more of developed area, in the direct watershed of an urban impaired stream; or

(b) Other stream, coastal and freshwater wetland watersheds. One acre or more of impervious area, or 5 acres or more of developed area, in any other stream, coastal, or wetland watershed.

Some projects in lake watersheds have the option to meet general standards in lieu of the phosphorus standards as described in Section 4(C) below.

(2) **Description of general standards**. To meet the general standards, a project's stormwater management system must include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This must be achieved by using one or more of the following methods to control runoff from no less than 95% of the impervious area and no less than 80% of the developed area that is impervious or landscaped. Where treatment of 95% of the impervious area is not practicable, the department may allow treatment on as low as 90% of the impervious area if the applicant is able to demonstrate that treatment of a greater depth of runoff than specified in the standards will result in at least an equivalent amount of overall treatment for the impervious area.

The department may, on a case-by-case basis, consider alternate treatment measures to those described in this section. An alternate treatment measure must provide at least as much pollutant removal as the treatment measures listed below and, unless otherwise approved by the department, as much channel protection and temperature control.

If a project is not in an urban impaired stream watershed, the department may allow the portion of a project's impervious or developed acreage that must be treated to be reduced through mitigation by eliminating or reducing an off-site or on-site impervious stormwater source (see 06-096 CMR 501).

NOTE: The department strongly encourages applicants to incorporate low-impact development (LID) measures where practicable. LID addresses avoidance of stormwater impacts by minimizing developed and impervious areas on the project site. LID project design considers the location of any protected natural resources, and maintaining natural drainage patterns and pre-construction time of concentration. If practicable, LID incorporates runoff storage measures dispersed uniformly throughout a site rather than single point collection of stormwater through conventional end-of-pipe structures.

(a) **Wetpond with detention above the permanent pool**. A stormwater management system using detention to control runoff must detain, above a wetpond's permanent pool, a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area. If located within a stream watershed, a pond needs to discharge through an underdrained gravel outlet. A wetpond must have a storage volume below the permanent pool elevation at least equal to 1.5 inches times the subcatchment's impervious area plus 0.6 inch times the subcatchment's non-impervious developed area, a mean depth of at least three feet, and a length to width ratio of 2:1 or greater.

(b) **Filter**. A detention structure using filters to control runoff must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the

subcatchment's developed area that is landscaped and discharge it solely through an underdrained vegetated soil filter having a single outlet with a diameter no greater than eight inches, or through a proprietary filter system approved by the department.

(c) **Infiltration**. A stormwater management system using infiltration to control runoff must retain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's developed area that is landscaped and infiltrate this volume into the ground. Pre-treatment of stormwater must occur prior to discharge to the infiltration area. The infiltration area must minimize discharge of soluble pollutants to groundwater, and must be maintained to assure that its capacity for infiltration and pollutant removal is unimpaired. An infiltration system serving a development regulated under the Site Location of Development Act may be required to meet additional standards.

Infiltration from a stormwater infiltration system is considered *de minimus* and does not require an individual waste discharge license if the standards in Appendix D are met. For definitions and provisions associated with the Waste Discharge program, see 38 M.R.S.A. §§ 413 *et seq*., and chapter 520 *et seq.* for waste discharge licensing concerns.

All drywells and subsurface fluid distribution systems must be registered with and meet all other requirements of the Department's Underground Injection Control Program.

(d) **Buffers**. A stormwater management system using buffers to control runoff must meet the design and sizing requirements described in Appendix F.

(3) **Exceptions from the general standards**. A project is eligible for an exception from the general standards as follows.

(a) **Pretreatment measures**. A project that includes measures to pretreat runoff to a filter or infiltration system in a department-approved, flow-through sedimentation device may reduce the runoff volume to each treatment measure described in Section 4(B)(2)(b) and (c) by 25%.

(b) **Discharge to the ocean, great pond or a major river segment**. A project discharging to the ocean, great pond or a major river segment and using a wetpond to meet the general standards is not required to incorporate treatment storage above the wetpond's permanent pool or to install an underdrain. The underdrain may also be omitted from a wetpond when discharging to a wetland if the department determines that filtering and temperature reduction, normally provided by an underdrain, are not necessary for maintaining the functions of the wetland.

(c) **A linear portion of a project**. For a linear portion of a project, runoff volume control may be reduced to no less than 75% of the volume from the impervious area and no less than 50% of the developed area that is impervious or landscaped, or the runoff volume to each treatment measure described in Section 4(B)(2) above may be reduced by 25%.

(d) **A utility corridor or portion of a utility corridor**. A utility corridor or portion of a utility corridor that meets the following criteria is not required to meet General standards.

(i) The project or portion of the project does not include impervious area;

(ii) Disturbed areas are restored to pre-construction contours and revegetated following construction;

(iii) Mowing of the revegetated right–of-way occurs no more than once during any twelve month period; and

(iv) A vegetation management plan for the project has been reviewed and approved by the department.

(e) **Stormwater Management Law project including redevelopment**. For a project requiring a Stormwater Management Law permit that includes redevelopment of impervious area that was in existence as of November 16, 2005 (the effective date of Chapter 500 revisions), the redevelopment of that impervious area is not required to meet General standards provided the department determines that the new use of the existing impervious area is not likely to increase stormwater impacts resulting from the proposed project's stormwater runoff beyond the level of impact already caused by the runoff from the existing impervious area. The requirements of Appendix D must still be met, if applicable.

(f) **Site Location of Development Law project including redevelopment**. For a project requiring a Site Location of Development Law permit that includes redevelopment of existing impervious area that was in existence as of November 16, 2005 (the effective date of Chapter 500 revisions), redevelopment of that impervious area is required to meet the general standards to the extent practicable as determined by the department. If the department determines that it is not practicable to make significant progress towards meeting the general standards for the redeveloped impervious area, the department may require off-site mitigation within the same watershed as an alternative for stormwater treatment. The requirements of Appendix D must still be met, if applicable.

C. Phosphorus standards

(1) When the phosphorus standards must be met. The phosphorus standards apply only in lake watersheds. A project disturbing one acre or more and resulting in any of the following is required to meet the phosphorus standards described in Section 4(C)(2) below.

(a) Lake most at risk watersheds. 20,000 square feet or more of impervious area, or 5 acres or more of developed area, in the direct watershed of a lake most at risk, except that an applicant with a project that includes less than three acres of impervious area and less than 5 acres of developed area may choose to meet the general standards rather than the phosphorus standards if the lake is not severely blooming. Severely blooming lakes are a subset of lakes most at risk as listed in Chapter 502.

(b) **Any other lake watershed**. One acre or more of impervious area, or 5 acres or more of developed area, in any other lake watershed, except that an applicant with a project that includes less than three acres of impervious area and less than 5 acres of developed area may choose to meet the general standards rather than the phosphorus standards.

(2) **Description of phosphorus standards**. An allowable per-acre phosphorus allocation for each lake most at risk will be determined by the department. The department's determination

is based upon current water quality, potential for internal recycling of phosphorus, potential as a cold-water fishery, volume and flushing rate, and projected growth in the watershed. This allocation will be used to determine phosphorus allocations for a project unless the applicant proposes an alternative per-acre phosphorus allocation that is approved by the department. If the project is a road in a subdivision, only 50% of the parcel's allocation may be applied to the road unless phosphorus export from both the road and the lots is subject to this chapter, in which case the entire allocation for the parcel may be applied.

NOTE: For guidance in calculating per-acre phosphorus allocations and in determining if stormwater phosphorus export from a project meets or exceeds the parcel's allocation, see Volume II of the Maine Stormwater Management BMP Manual.

D. Urban impaired stream standard. If required, the urban impaired stream standard applies in addition to the basic standards, general standards and phosphorus standards described in Sections 4(A), (B) and (C).

(1) When the urban impaired stream standard must be met. If a project located within the direct watershed of urban impaired stream or stream segment listed in chapter 502 results in three acres or more of impervious area or 20 acres or more of developed area, requires review pursuant to the Site Law, or is a Site Law modification of any size as described in Section 16 of this chapter, the urban impaired stream standard must be met.

(2) Description of the urban impaired stream standard. A project in the direct watershed of an urban impaired stream must pay a compensation fee or mitigate project impacts by treating, reducing or eliminating an off-site or on-site pre-development impervious stormwater source as described in 06-096 CMR 501. Compensation fees must be paid to the department's compensation fund or to an organization authorized by the department pursuant to the Stormwater Management Law, 38 M.R.S.A. §420-D(11).

(3) Exception for a project including redevelopment. Redevelopment of an existing impervious area is not required to meet the urban impaired stream standard provided the department determines that the new use of the existing impervious area is not likely to increase stormwater impacts in the proposed project's stormwater runoff beyond the levels already present in the runoff from the existing impervious area.

E. Flooding standard. If required, the flooding standard applies in addition to the basic standards, general standards, phosphorus standards and urban impaired stream standards described in Sections 4(A), (B), and (C).

(1) **When the flooding standard must be met**. If a project results in three acres or more of impervious area or 20 acres or more of developed area, requires review pursuant to the Site Law, or is a modification of any size as described in Section 16 of this chapter, the flooding standard must be met. Stormwater management systems for these projects must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.

(2) **Waiver of the flooding standard**. A project is eligible for a waiver from the flooding standard as follows.

APPENDIX A. Erosion and sedimentation control

This appendix applies to all projects.

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in 38 M.R.S.A. §480-B. Sediment control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken.

NOTE: The site must be maintained to prevent unreasonable erosion and sedimentation. See 38 M.R.S.A §420-C (in part). Other or additional standards than those provided in Appendix A may apply, under the Natural Resources Protection Act, to a project located in or adjacent to a protected natural resource.

NOTE: For guidance on erosion and sedimentation controls, consult "Maine Erosion and Sediment Control BMPs", Maine Department of Environmental Protection.

1. **Pollution prevention.** Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable.

   The discharge may not result in erosion of any open drainage channels, swales, upland, or coastal or freshwater wetlands.

   NOTE: Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Minimizing disturbed areas through phasing limits the amount of exposed soil on the site through retention of natural cover and by retiring areas as permanently stabilized. Less exposed soil results in fewer erosion controls to install and maintain. If work within an area is not anticipated to begin within two weeks time, consider leaving the area in its naturally existing cover.

2. **Sediment barriers.** Prior to construction, properly install sediment barriers at the edge of any downgradient disturbed area and adjacent to any drainage channels within the disturbed area. Maintain the sediment barriers until the disturbed area is permanently stabilized.

3. **Temporary stabilization.** Stabilize with mulch or other non-erodable cover any exposed soils that will not be worked for more than 7 days. Stabilize areas within 75 feet of a wetland or waterbody within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.

4. **Removal of temporary sediment control measures.** Remove any temporary sediment control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

   NOTE: It is recommended that silt fence be removed by cutting the fence materials at ground level to avoid additional soil disturbance.

5. **Permanent stabilization.** If the area will not be worked for more than one year or has been brought to final grade, then permanently stabilize the area within 7 days by planting vegetation, seeding, sod,

or through the use of permanent mulch, or riprap, or road sub-base. If using vegetation for stabilization, select the proper vegetation for the light, soil and moisture conditions; amend areas of disturbed subsoils with topsoil, compost, or fertilizers; protect seeded areas with mulch or, if necessary, erosion control blankets; and schedule sodding, planting, and seeding to avoid die-off from summer drought and fall frosts. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established. If necessary, areas must be seeded and mulched again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. One or more of the following may apply to a particular site.

(a) **Seeded areas**. For seeded areas, permanent stabilization means a 90% cover of healthy plants with no evidence of washing or rilling of the topsoil.

(b) **Sodded areas**. For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.

(c) **Permanent Mulch**. For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

(d) **Riprap**. For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.

(e) **Agricultural use**. For construction projects on land used for agricultural purposes (e.g., pipelines across crop land), permanent stabilization may be accomplished by returning the disturbed land to agricultural use.

(f) **Paved areas**. For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed.

(g) **Ditches, channels, and swales**. For open channels, permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation, with a well-graded riprap lining, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

6. Winter construction. "Winter construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

NOTE: For guidance on winter construction standards, see the "Maine Erosion and Sediment Control BMPs", Maine Department of Environmental Protection.

7. Stormwater channels. Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using measures that achieve long-term erosion control. Ditches, swales, and other open stormwater channels must be designed to handle, at a minimum, the expected volume of run-off. Each channel should be constructed in sections so that the section's grading, shaping, and installation of the permanent lining can be completed the same day. If a channel's final grading or

lining installation must be delayed, then diversion berms must be used to divert stormwater away from the channel, properly-spaced check dams must be installed in the channel to slow the water velocity, and a temporary lining installed along the channel to prevent scouring. Permanent stabilization of channels is addressed under Appendix A(5)(g) above.

8. **Roads.** Gravel and paved roads must be designed and constructed with crowns or other measures, such as water bars, to ensure that stormwater is delivered immediately to adjacent stable ditches, vegetated buffer areas, catch basin inlets, or street gutters.

9. **Culverts.** Culverts must be sized to avoid unintended flooding of upstream areas or frequent overtopping of roadways. Culvert inlets must be protected with appropriate materials for the expected entrance velocity, and protection must extend at least as high as the expected maximum elevation of storage behind the culvert. Culvert outlet design must incorporate measures, such as aprons or plunge pools, to prevent scour of the stream channel. The design must take account of tailwater depth.

10. **Parking areas**. Parking areas must be constructed to ensure runoff is delivered to adjacent swales, catch basins, curb gutters, or buffer areas without eroding areas downslope. The parking area's subbase compaction and grading must be done to ensure runoff is evenly distributed to adjacent buffers or side slopes. Catch basins must be located and set to provide enough storage depth at the inlet to allow inflow of peak runoff rates without by-pass of runoff to other areas.

11. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

APPENDIX B. Inspection and maintenance

This appendix applies to all projects. A project that is only required to meet basic standards (stormwater PBR) must meet the standards in Section 1. All other projects must meet standards in Sections 1 through 5.

See Appendix D(5) for additional maintenance requirements related to infiltration of stormwater.

1. During construction. The following standards must be met during construction.

(a) **Inspection and corrective action**. Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

(b) **Maintenance**. Maintain all measures in effective operating condition until areas are permanently stabilized. If best management practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).

(c) **Documentation**. Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

2. Post-construction. The following standards must be met after construction.

(a) **Plan**. Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 7(C)(2) for submission requirements.

(b) **Inspection and corrective action**. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.

NOTE: Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(i) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).

(ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

(iii) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

(iv) Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at inlet any grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

(v) Inspect resource and treatment buffers at least once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

(c) **Regular maintenance**

(i) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top

culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.

(ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

NOTE: Contact the department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(d) **Documentation**. Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal.

The log must be made accessible to department staff and a copy provided to the department upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

3. Maintenance contract. Contract with a third-party or other qualified professional, as approved by the department, for the removal of accumulated sediments, oils, and debris within any proprietary devices and the replacement of any absorptive filters. The frequency of sediment clean-out and filter replacements must be consistent with the unit's storage capacity and the estimated pollutant load from the contributing drainage area. This clean-out frequency is usually established by the manufacturer of the proprietary system when sizing the device for the project.

4. Re-certification. Submit a certification of the following to the department within three months of the expiration of each five-year interval from the date of issuance of the permit.

(a) **Identification and repair of erosion problems**. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) **Inspection and repair of stormwater control system**. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

(c) **Maintenance**. The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities

not regulated by MPDES, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

5. **Duration of maintenance.** Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with department standards. Upon such assumption of responsibility, and approval by the department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

6. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

APPENDIX C. Housekeeping

These performance standards apply to all projects.

1. **Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

   See Appendix D for license by rule standards for infiltration.

   NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

   NOTE: An example of the use of BMPs to control fugitive sediment and dust is as follows. Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.

   NOTE: Dewatering a stream without a permit from the department violates state water quality standards and the Natural Resources Protection Act.

4. **Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through

gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.

NOTE: For guidance on de-watering controls, consult the Maine Erosion and Sediment Control BMPs", Maine Department of Environmental Protection."

6. **Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges.

7. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

specification 703.22 Type B) extending 24 inches over the top of the drainage pipe, with at east six inches to the sides of the pipe, and six inches below the pipe.

(iv) **Underdrain outlet**. The underdrain outlet must discharge to an area capable of withstanding concentrated flows and saturated conditions without eroding.

4. Underdrained Soil Filter Beds Design Requirements

Underdrained soil filter are designed to provide pollutant removal and channel protection as they provide the slow release of runoff. The filter also provides cooling of the discharge reducing thermal impact to the receiving body of water.

NOTE: Specific design criteria for each type of filter bed structure and design can be found in the department's BMP manual "Stormwater Management for Maine."

Bed construction

Underdrained soil filter basins designed to meet the general standards for soil filters must be designed to meet the following criteria.

(a) **Volume stored and treated**. The soil filter basin must store and filter at least 1.0 inch of stormwater runoff from the impervious area draining to it and 0.4 inches of stormwater runoff from the landscaped area draining to it. A stable overflow outlet must be provided for stormwater in excess of the volume to be stored for treatment.

(b) **Soil filter**. The soil filter basin must consist of depressional surface storage over a densely vegetated soil filter that is underlain with underdrain bedding and drained by perforated under drain pipe. The soil filter material must be fine enough to filter fine sediments and provide effective adsorption of pollutants, but coarse enough to slowly drain the stored stormwater within a 24 to 48 hour period. The soil filter material must be well blended and graded and must contain sufficient organic matter to facilitate the removal and treatment of hydrocarbons.

(c) **Underdrain pipe bedding**. The interface between the underdrain bedding material and the soil filter material must be designed to minimize the risk of clogging at the interface while preventing significant loss of fine soil material from the soil filter layer. The underdrain bedding material must be sufficiently coarse to allow flow of treated water to the underdrain pipe.

(d) **Filter bed design**. The area and volume of the soil filter must be adequate to provide effective long term treatment of the volume of stormwater to be treated.

(e) **Underdrain outlet**. The underdrain system and the overflow must discharge to areas capable of withstanding concentrated flows and saturated conditions without eroding.

5. Additional requirements. Additional requirements may be applied on a site-specific basis.

APPENDIX F. Vegetated buffers

This appendix applies to all projects using vegetated buffers for stormwater control. A buffer is a vegetated, non-lawn area or areas located down gradient from a project that serves to store and remove pollutants from stormwater runoff flowing from a project. Buffers must not be interrupted by intermittent or perennial stream channels or other drainageways and must have a relatively uniform slope so that stormwater does not concentrate in channels. This appendix describes the design and sizing requirements for vegetated buffers designed to meet the general standards. Requirements are described for four different types of buffers, each of which is appropriate for specific situations.

1. **Types of vegetated buffers.** The applicability of each of the four types of vegetated buffers is as follows.

   (a) **Vegetated buffer with stone bermed level lip spreaders**. A vegetated buffer with stone bermed level lip spreaders must be used when treating stormwater runoff from any of the following:

   (i) An impervious area greater than one acre;

   (ii) Impervious areas where the flow path across the impervious area exceeds 150 feet; or

   (iii) Developed areas, including lawns and impervious surfaces, where runoff is concentrated, intentionally or unintentionally, so that it does not run off in well-distributed sheet flow when it enters the upper end of a buffer, except that road ditch runoff may be treated using a ditch turn-out buffer.

   (b) **Buffer adjacent to the down hill side of a road**. A buffer located along the down hill side of a road may only be used when the runoff from the road surface and shoulder sheets immediately into a buffer. In no instance may runoff from areas other than the adjacent road surface and shoulder be directed to these buffers.

   (c) **Ditch turn-out buffer**. A ditch turn-out buffer may only be used when runoff from a road ditch is diverted to a 20-foot stone bermed level lip spreader that distributes runoff into a buffer. No areas other than the road surface, road shoulder and road ditch may be directed into a buffer. No more than 400 ft of road and ditch may be treated in any ditch turn-out buffer, and no more than 250 feet may be treated if more than one travel lane is draining to the ditch.

   (d) **Buffer adjacent to residential, largely pervious or small impervious areas**. A buffer adjacent to a residential, largely pervious or small impervious area that does not require that runoff be distributed by means of a level spreader may only be used when:

   (i) A buffer is located immediately downhill of the developed area; and

   (ii) Runoff from the developed area is not concentrated and enters a buffer in well distributed sheet flow.

   Only runoff from the following areas may be treated using this type buffer:

   (iii) A single family residential lot;
   (iv) A developed area with less than 10% imperviousness where the flow path over the portion of the developed area for which treatment is being credited does not exceed 150 feet; or

(v) An impervious area of less than one acre, where the flow path across the impervious area does not exceed 100 feet.

2. **Design requirements for all buffer types.** The following design requirements apply to all types of buffers.

   (a) **Topography.** The topography of a buffer area must be such that stormwater runoff will not concentrate as it flows across a buffer, but will remain well-distributed. Flow paths of runoff through a buffer must not converge, but must be essentially parallel or diverging.

   (b) **Vegetative cover**. The vegetative cover type of a buffer must be either forest or meadow. In most instances the sizing of a buffer varies depending on vegetative cover type.

      (i) **Forest buffer**. A forest buffer must have a well distributed stand of trees with essentially complete canopy cover, and must be maintained as such. A forested buffer must also have an undisturbed layer of duff covering the mineral soil. Activities that may result in disturbance of the duff layer are prohibited in a buffer.

      (ii) **Meadow buffer**. A meadow buffer must have a dense cover of grasses, or a combination of grasses and shrubs or trees. A buffer must be maintained as a meadow with a generally tall stand of grass, not as a lawn. It must not be mown more than twice per calendar year. If a buffer is not located on natural soils, but is constructed on fill or reshaped slopes, a buffer surface must either be isolated from stormwater discharge until a dense sod is established, or must be protected by a three inch layer of erosion control mix or other woodwaste material approved by the department before stormwater is directed to it, with vegetation must be established using an appropriate seed mix.

      (iii) **Mixed meadow and forest buffer**. If a buffer is part meadow and part forest, the required sizing of a buffer must be determined as a weighted average, based on the percent of a buffer in meadow and the percent in forest, of the required sizing for meadow and forest buffers.

   (c) **Deed restrictions and covenants**. Areas designated as vegetated buffers must be clearly identified on site plans and protected from disturbance by deed restrictions and covenants.

3. **Design specifications and sizing tables for a vegetated buffer with stone bermed level lip spreaders.** Stormwater runoff must be delivered to a vegetated buffer with stone bermed level lip spreaders in either sheet or concentrated flow. These design specifications direct runoff behind a stone berm constructed along the contour at the upper margin of a buffer area. As a result of restriction of flow through the berm, the runoff then spreads out behind the berm so that it seeps through the entire length of the berm and is evenly distributed across the top of a buffer. The stone must be coarse enough that it will not clog with sediment. The berm must be well-graded and contain some small stone and gravel so that flow through the berm will be restricted enough to cause it to spread out behind the berm.

   (a) **Stone berm specifications**. The stone berm must be at least 1.5 feet high and 2.0 feet across the top with 2:1 side slopes constructed along the contour and closed at the ends. Unless otherwise approved by the department, the design must include a shallow, 6-inch deep trapezoidal trough with a minimum bottom width of three feet, and with a level downhill edge excavated along the contour on the uphill edge of the stone berm. Stone for stone bermed level lip spreaders must consist of sound durable rock that will not disintegrate by exposure to water or weather.

Fieldstone, rough quarried stone, blasted ledge rock or tailings may be used. The rock must be well-graded within the following limits, or as otherwise approved by the department.

Sieve Designation (Metric)	Sieve Designation (US Customary)	Percent by Weight passing Square Mesh Sieves
300 mm	12 in	100
150 mm	6 in	84-100
75 mm	3 in	68-83
25.4 mm	1 in	42-55
4.75 mm	No. 4	8-12

(b) **Buffer sizing**. The required size of a buffer area below the stone bermed level lip spreader varies with the size and imperviousness of the developed area draining to a buffer, the type of soil in a buffer area, the slope of a buffer, and the vegetative cover type. The following table indicates the required berm length per acre of impervious area and lawn draining to a buffer for a given length of flow path through a buffer. Required berm length varies by the Hydrologic Soil Group of the soils in a buffer and by the length of flow path through a buffer. If more than one soil type is found in a buffer, the required sizing of a buffer must be determined as weighted average, based on the percent of a buffer in each soil type, of the required sizing for each soil type buffer. Alternative sizing may be allowed if it is determined by a site specific hydrologic buffer design model approved by the department. A buffer meeting this standard is not allowed on Hydrologic Soil Group D soils that are identified as wetland soils. A buffer meeting this standard is not allowed on natural slopes in excess of 15% unless a buffer has been evaluated using a site specific hydrologic buffer design model approved by the department, and measures have been included to ensure that runoff remains well-distributed as it passes through a buffer.

The table below applies to a buffer with slopes ranging from 0 to 8%. For a buffer with slopes between 9% and 15%, the indicated berm length must be increased by 20%.

NOTE: The following tables were developed using a 1.25 inch, 24 hour storm of type III distribution, giving a maximum unit flow rate of less than 0.009 cfs per foot.

Required berm and flow length of buffer with 0–8% slope and a stone bermed level lip spreader.

Hydrologic Soil Group	Length of flow path through buffer (feet)	Berm length for a forested buffer (feet)		Berm length for a meadow buffer (feet)	
		Per acre of impervious area	Per acre of lawn	Per acre of impervious area	Per acre of lawn
Soil Group A	75	75	25	125	35
	100	65	20	75	25
	150	50	15	60	20
Soil Group B	75	100	30	150	45
	100	80	25	100	30
	150	65	20	75	25
Soil Group C, sandy loam or loamy sand	75	125	35	150	45
	100	100	30	125	35
	150	75	25	100	30
Soil Group C, silt loam, clay loam or silty clay loam	100	150	45	200	60
	150	100	30	150	45
Soil Group D, non-wetland	150	150	45	200	60

4. **Design specifications and sizing tables for a buffer adjacent to the down hill side of a road.** A buffer adjacent to the down hill side of a road may only be used when a buffer is located such that the runoff from the road surface and shoulder sheets immediately into a buffer. Required buffer design and sizing for this type of buffer does not vary with soil type or slope, except that a buffer meeting this standard is not allowed on soils identified as wetland soils or on natural slopes in excess of 20%. Sizing depends on the vegetative cover type of a buffer and the number of travel lanes draining to a buffer as indicated in the following table.

	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
One travel lane draining to buffer	35	50
Two travel lanes draining to buffer	55	80

The inslope of the road bed may be included as part of a meadow buffer only if it is designed and constructed to allow infiltration. Design and construction to allow infiltration includes, but is not limited to, the inslope fill material having slopes no steeper than 3:1; loaming and seeding to meadow grasses; and maintaining a buffer area as a meadow buffer.

5. **Design specifications and sizing tables for a ditch turn-out buffer.** A ditch turn-out buffer may only be used when runoff from a road ditch is diverted to a 20-foot stone bermed level lip spreader that distributes runoff into a buffer. No areas other than the road surface, road shoulder, road ditch, and ditch back slopes may be directed to the stone bermed level lip spreader.

   (a) **Stone berm specifications**. The stone berm to which the ditch turn-out delivers the runoff must be at least 20 feet in length and must be constructed along the contour. It must be at least one-foot high and two feet across the top with 2:1 side slopes. Stone for the berm must consist of sound durable rock that will not disintegrate by exposure to water or weather. Fieldstone, rough quarried stone, blasted ledge rock or tailings may be used. The rock must be well-graded with a median size of approximately 3 inches and a maximum size of 6 inches.

   (b) **Buffer sizing**. The required size of a buffer area below the stone bermed level lip spreader varies with the type of soil in a buffer area, the slope of a buffer, the length of road ditch draining to a buffer and the vegetative cover type within a buffer. A buffer meeting this standard is not allowed on Hydrologic Soil Group D soils or on slopes in excess of 15%. The following table indicates the required length of the flow path through a buffer for various vegetative covers and ditch lengths. The tables below apply to a buffer with slopes ranging from 0 to 8%. For a buffer with slopes between 9% and 15%, the indicated length of flow path should be increased by 20%. If two travel lanes drain to the ditch, as in the case of a super elevated road, the length of flow path indicated for 400 feet of road must be used, but no more than 250 feet of ditch may drain to each turn-out.

Required length of flow path per length of road or ditch draining to a buffer.

Hydrologic soil group of soil in buffer	Length of road or ditch draining to a buffer (feet)	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
A	200	50	70
	300	50	85
	400	60	100
B	200	50	70
	300	50	85
	400	60	100
C Loamy Sand or Sandy Loam	200	60	100
	300	75	120
	400	100	Not applicable
C Silt Loam, Clay Loam, or Silty Clay Loam	200	75	120
	300	100	Not applicable
D Non-wetland	200	100	150

6. **Design specifications and sizing tables for a buffer adjacent to a residential lot; developed area with less than 10% imperviousness, where the flow path over the portion of the developed area for which treatment is being credited does not exceed 150 feet; or an impervious area where the flow path across the impervious area does not exceed 100 feet.** The design specifications and sizing tables below may only be used when a buffer is located immediately adjacent to the downhill side of a developed area, and where the topography and structures within the developed area do not cause any significant concentration of runoff.

   This design is appropriate for residential lots and other mostly pervious areas with relatively uniform topography and for small impervious areas. This design is not appropriate for treating large impervious areas because, even if pavement is graded evenly, it is likely that some concentration of runoff will occur as the stormwater travels across large areas of pavement. For large areas of pavement where the average path of flow across the pavement exceeds 100 feet, or where runoff will not be evenly distributed across the downhill edge of the pavement, a stone bermed level lip spreader must be used and the berm and buffer must be sized according to the specifications in Section 3 above.

   The table below indicates the required minimum length of the flow path through a buffer for various soil types and vegetative cover types. Length of flow paths defined in this table apply to buffers with slopes between 0 and 8%. For buffers with slopes between 9% and 15%, the indicated length of flow path must be increased by 20%. A buffer meeting this standard is not allowed on slopes in excess of 15% or Hydrologic Soil Group D soils except that a forested buffer is allowed if the D soils in a buffer are not wetland soils. Buffers described by this section must be located downhill of the entire developed area for which it is providing stormwater treatment, such that all runoff from the entire developed area has a flow path through a buffer at least as long as the required length of flow path.

Required minimum length of the flow path through a buffer for various soil types and vegetative cover types.

Hydrologic soil group of soil in buffer	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
A	45	75
B	60	85
C **Loamy Sand or Sandy Loam**	75	100
C **Silt Loam, Clay Loam, or Silty Clay Loam**	100	150
D **Non-wetland**	150	Not applicable

LUPC Subdivision Rule Review

Preliminary Technical Issues Report

Appendix F

Excerpts from "A Heritage for the Future, Maine's Statewide Historic Preservation Plan," Fourth Addition, Maine Historic Preservation Commission, 2011

LUPC Subdivision Rule Review

Technical Issues

Excerpts from “A Heritage for the Future, Maine’s Statewide Historic Preservation Plan”

Fourth Addition

Maine Historic Preservation Commission

2011

A Heritage for the Future:
Maine's Statewide Historic Preservation Plan

Fourth Edition

Maine Historic Preservation Commission
2011

of significant sites that may be under threat from looting, for example, would thus have a high priority for Nomination.

Predictive Models for Prehistoric Site Location

The vast majority (greater than 95 percent) of archaeological sites in Maine are habitation/workshop sites at which Native Americans with a generalized hunter/gatherer or hunter/gatherer-horticultural economy both lived and worked. Much rarer site types include cemetery sites, pictographs or petroglyphs, and quarry-related workshop sites. The latter, quarry/workshop sites, are predictable from bedrock outcrop maps. The rare cemetery and pictograph/petroglyph sites tend to occur within the shoreland zone near habitation workshop sites, so their presence is covered by the other predictive model for habitation/workshop sites.

The predictive model for habitation/workshop sites (most often referred to as the predictive model for "sites" in general) is based on the fact that over 98 percent of habitation/workshop sites are located adjacent to a body of water that is navigable by canoe. For most of Maine prehistory, except the Paleoindian period, Maine was covered by a dense forest, and people tended to live and travel along waterways. They camped for a season or built their villages on areas of low slope adjacent to water shorelines, usually on the best drained area of low slope within a stretch of several hundred yards of shoreline. Thus, any canoe-navigable water body shoreline is considered a potential area for a prehistoric archaeological site.

This predictive model is complicated by the fact that water body shorelines have changed in some cases in the last 11,000 or 12,000 years. Such changes include abandonment of river channels, post-glacial uplift of the interior causing lake levels to change, or down-cutting and abandonment of river banks. Thus, not only must we consider the banks and flood plains of existing canoe navigable bodies of water, but we must also consider fossil shorelines as areas of archaeological potential. The coast of Maine has been sinking, and the coastline therefore has been progressively inundated, beginning about the time of initial Paleoindian habitation. Therefore, "fossil" marine coastal shorelines formed since Native Americans have been in Maine are all now underwater. A few archaeological sites, composed of scattered and damaged large stone tools, have been found offshore, primarily by scallop draggers (see "Underwater Prehistoric Sites" section below).

Approximately 2.5 percent (157 of 6015 in 2011) of sites are located away from water shorelines, either fossil or existing. Except for eleven quarry sites, 90% these sites are located on well-drained glacial outwash sand or slightly gravelly sand soils. They are often near a small upland stream, a rise in the landscape providing a good view, a large marsh complex, or a sand dune field providing some topographic variation. Of the 146 non-quarry "away" sites, 58 sites have no known cultural affiliation leaving 88 "away" sites where cultural affiliation is indicated. Of these 88 sites, 44 have Archaic Period components, 30 have components that are Paleoindian in age, 20 have Ceramic Period Components, and 2 have Contact Period components. The majority of the

habitation/workshop sites located away from water on sandy soils are either Archaic or Paleoindian in age.

Enough survey of Maine has been accomplished to assert that habitation/workshop sites are rarely or never found on till-based soil or other poorly drained soils away from water body shorelines. This predictive model for habitation/workshop sites has been tested numerous times in recent years with "cross country" surveys for gas pipelines, power lines, and fiber-optic cable lines. A small amount of "random" testing, and testing of low or medium-probability landforms, is included in some of these surveys, and all surveys include walking the line route to inspect soil exposures, in addition to intensive testing of "high" probability land forms near water. For example, of 22 sites found on the Maritimes and Northeast Pipeline survey, 19 (86%) were located in areas judged by the predictive model, in advance, to have high archaeological potential, 3 (14%) in areas judged to have medium archaeological potential, and none (0%) in low potential areas (Will 2000).

Thus, the predictive model for prehistoric (habitation/workshop) sites in Maine is essentially bi-partite, with one being focused on water shorelines or "fossil" water shores, and the other being focused on well-drained sandy glacial outwash soils with some sort of an additional factor such as topographic relief or upland stream presence. This predictive model is used virtually every day in Review and Compliance project review, with the decision of whether or not to require archaeological fieldwork being made on the basis of topography, surficial geography, and water body shoreline presence.

Underwater Prehistoric Sites

Geological reconstructions of the Gulf of Maine indicate that the approximate time of arrival of Paleoindians and the first settlement of Maine (about 13,000 cal yr, or 11,000 radiocarbon years) was also a time of maximum postglacial exposure of dry land on the inner continental shelf. Various data developed primarily by the University of Maine (Orono) indicate that land to a current depth underwater of approximately – 65 to 70 m (about 200 feet) was exposed dry land at the time. Sea level rise, at varying rates, has characterized the Maine coast since. All coastal archaeological sites with intact, uneroded deposits above the reach of the high tide now are no older than about 5000 years along the Maine coast. Uneroded sites with 4000 to 5000 year old components are rare. Most "coastal" sites that have survived sea level rise are no older than about 3000 years. Thus, the archaeological record of coastal habitation for the Paleoindian, Early and Middle Archaic periods is now underwater.

Fishermen (mostly scallop draggers) have dragged up stone tools from several locations along the Maine coast, indicating probable now-submerged prehistoric site locations. The potential for a submerged prehistoric archaeological record, coupled with threats of disturbance of the sea floor from development, including anchors for large offshore windpower installations, and buried power cables, has focused recent research attention on these sites. A NOAA Ocean Exploration grant (NA07OAR4600295) for 2007 to 2009 was used by principal investigators from University of New Hampshire, University of Maine, and the Maine Historic Preservation Commission to complete

detailed bottom and subbottom mapping and geological coring in an area southwest of Bass Harbor, where stone tools of about 8000 year age had been recovered. The research succeeded in finding intact, terrestrial deposits (salt marsh and tombolo beach) and reconstructing a time series of local geomorphological changes as a near-shore freshwater pond was breached by rising sea level. The stone tools recovered by draggers came from a beach deposit adjacent to the former pond, exactly the sort of environment where coastal sites are found today above water.

The combination of sea level rise data and geomorphological data allowed the U. Maine project geologists to conclude that submerged landscapes may most often survive (with prehistoric sites) between 17 and 22 m depth, with associated ages of between 11,500 cal years and 7500 cal years before present. These results are now being used to require appropriate remote geological sensing surveys on Federally or state licensed offshore development. This information thus constitutes a "new" predictive model for prehistoric archaeological sites now underwater.

Review and Compliance Results

The results of archaeological survey for Review and Compliance projects are presented below for two periods of time that we have examined in detail.

1999 Surveys

The Commission staff reviewed 2,126 projects in calendar year 1999, including reviews for archaeological sites on over 90 percent of these. The vast majority of these projects were reviewed by applying our predictive model of site locations if the area had not been previously surveyed, or by noting the presence or absence of archaeological sites if it had been previously surveyed. An archaeological survey was required in 89 cases (4.2 percent of the total). Approximately half of those localities determined to require a survey are not actually surveyed, at least not immediately. Sometimes a project is cancelled for unknown reasons or is cancelled for highly public reasons such as changes in economics or financial backing. Some projects are redesigned to avoid the archaeologically sensitive area, while others are postponed for a number of years only to resurface later.

Three of the 1999 projects that yielded archaeological sites proceeded through intensive level survey or further and produced significant results. All of these sites would have been destroyed without the Review and Compliance legislation and review system. One site containing Ceramic Period features including hearths, ceramics, and stone tools was found by a Department of Transportation bridge project near Sebago Lake. Another site was located on a sandy knoll that was designated for use as a sand borrow source for a cranberry bog in York County. The site contains a Late Archaic component and a Ceramic period village with hearth features. Finally, survey in advance of construction of a Wal-Mart store in Oxford located an extremely rare Late Paleoindian site dating about 10,000 years old, consisting of four discrete, undisturbed stone tool concentrations. Presumably these were four work areas in/around four living structures, probably all occupied at the same time. Extensive survey around the property indicated that the entire site was contained within the area proposed for construction of the loading dock and

associated parking area. Rather than redesigning or relocating their store, which was one option presented to them, Wal-Mart made the decision to pay for the complete, careful excavation of all four concentrations, as well as their analysis and reporting.

2000-2004 Surveys

During this period, MHPC staff reviewed a total of 13,200 projects. Archaeological survey was required for about 400 of these and 110 Phase I reports were received and added to the prehistoric documentation database. About 260 archaeological survey reports were sent to the MHPC by archaeological contractors between January, 2000 and the first half of 2005, but many of these were follow-up Phase II and III reports, surveys of conservation land purchases, and publications. Thus, approximately 30 percent of required surveys were completed, probably because of delays in project initiation or changes in financing or plans. A total of 88 sites were located by these 110 surveys, an average of 0.8 sites per survey.

Notable sites identified during this period include the late prehistoric Dow site (38.11) on a small tributary stream of the Kennebec River that would have been disturbed by installation of a fish-restriction dam. Two sites were found in the planning areas for a new international bridge near Calais and were avoided. A small Ceramic period site in Newport (71.30) was found to contain Ceramic period hearth remnants loaded with fish bone, in advance of the site being covered with fill to protect it. Four stratified sites on the Kennebec River were discovered during planning for a new bridge near Skowhegan, and several sites were found by small subdivision projects, and were protected from damage by changes made to construction plans.

Covenants and Easements

Archaeological conservation easements that include reference to archaeological assets on a property have become more commonplace in the last decade (Table C&E). With one exception, these are prehistoric archaeological sites. In Maine, conservation easements designed to protect archaeological sites, called Preservation Agreements, are created pursuant to Maine statute (33 M.R.S.A. § 1551-1555 inclusive, as amended), and the Maine Historic Preservation Commission is a governmental body empowered to hold an interest in real property as defined by 33 M.R.S.A. Section 1551 (A). Currently, 25 sites are covered by conservation easements or Preservation Agreements held by the Commission.

The Commission has accepted conservation easements from Federal agencies and national organizations before property was turned over to the private sector or other owners, such as the easement on site 69.8 and other sites on the Tracy Farm in Starks, and the easement on the Father Rasle Mission site (69.2) and the The Pines site in Madison. Both the Tracy Farm site and the Father Rasle Mission site are contributing sites within a National Historic Landmark district.