Muncaster
Environmental
Planning

April 22, 2003

Mr. Don Kennedy
D. W. Kennedy Consulting Ltd.
604 Courtenay Avenue
Ottawa, Ontario
K2A 3B5

Dear Mr. Kennedy:

RE: KNL Lands, Kanata North
Preliminary Tree Preservation and Conservation

This letter report represents a preliminary tree preservation and conservation plan, as outlined in Section 5.2.1 of the Regional Official Plan, Policy 4, for submission with a draft plan of subdivision application for the above property. The site consists of an area of approximately 225 hectares on the west and east sides of the Goulbourn Forced Road, between the Beaver Pond to the east and the First Line Road allowance (the existing wooden hydro pole line) to the west (Figure 1). The lands west of Goulbourn Forced Road extend to the south to abut the Richcraft lands currently under residential development and the north to the future Terry Fox Road alignment. Lands on the east side of the Goulbourn Forced Road south of the Beaver Pond are already developed and are not included in the scope of this report.

Introduction

The objectives of the preliminary tree preservation and conservation plan are:

- to produce a plan showing forested areas and smaller tree stands containing trees which warrant initial consideration for conservation measures as well as major groupings of other natural vegetation;

- to provide a general description of the wooded areas including species composition, age, vigour, soil drainage, topographic characteristics and degree of disturbance;

- to assess the existing health of the wooded areas, the existing and potential functions, if any, with respect to ecological features and aesthetics, and the sensitivity of such areas to changes in grades, drainage, sun and wind exposure and water table elevation;

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- to provide a professional opinion on the priority for retention of any wooded areas; and,

- to review the proposed subdivision layout to determine if appropriate opportunities for tree retention and planting exist and have been taken into consideration.

Background Information

As part of the larger Carp Ridge and South March Highlands Area, the Kanata Lakes study area provides a complex series of habitats that are unusual for the Region of Ottawa-Carleton (Brunton, 1992). The majority of the general area has been impacted to some extent by human disturbances such as logging since the 1800s, cattle grazing (primarily north of the Nepean–Arnprior Railway line), and agriculture (cropland west of the Goulbourn Forced Road). In 1870 much of the area was also impacted by what is known as the "Great Fire" (Brunton, 1992).

Bedrock outcroppings are common throughout the area. The major soil associations are Rockland and Anstruther (Schut and Wilson, 1987). The Anstruther soils are characterized by 10 – 50cm of acidic stony sandy loam, over bedrock with excessive to good drainage, while the Rockland association is represented by Precambrian bedrock comprising 25 percent or more of the area. The topography is moderately sloping (10 to 15 percent) with many irregular slopes, particularly in proximity to the Kizell Pond. Small areas of poorly drained Dalhousie silty clay loams are located south of the Kizell Pond and west of the Goulbourn Forced Road, while much of Shirley's Brook, including the proposed realigned area, is located within poorly drained North Gower silty loams. Huntley organic soils are within the Kizell and Beaver pond areas.

Colour aerial photography (1999, 1:15,000) was used to assess the natural environment features in the general vicinity of the subject site. Field reviews of the site were conducted on May 29th, May 30th, June 18th and June 26th, 2002. Additional vegetation observations were also noted as part of the many field visits completed with the study team and agency staff in August and September, 2002. Vegetation units were described using the methodology in the *Ecological Land Classification for Southern Ontario*. A detailed analysis of the wildlife and aquatic habitat of the site and associated linkages will be presented in an Environmental Impact Statement, along with site photographs.

The forested areas well to the west of the Goulbourn Forced Road represent the West Block Natural Environment Area proposed by Brunton (1992), while the forests east of the Goulbourn Forced Road, in the northeast portion of the study area, represent the Trillium Woods Natural Environment Area described by Brunton (1992). The forested portions of the study area east of the Goulbourn Forced Road and further to the west of the Forced Road are part of the 425 hectare candidate Provincially-significant South March Highlands life science Area of Natural and Scientific Interest (Brunton, 1992b). The entire study area is part of the South March Highlands Natural Area as defined in the former Region of Ottawa-Carleton's Natural Environment System Strategy (Brunton, 1997).

Vegetation Communities

The vegetation communities described below are marked on the attached Figure 1.

The Kanata Lakes area is characterized by upland vegetation that transitions abruptly to wetlands in depressional areas. The most common vegetation types are the early and late successional upland deciduous forest. The early successional community has a long history of disturbance due to fires, logging, and agricultural development (Brunton, 1992). Marshes are common in the vicinity of the Beaver Pond and along inputs to the pond, especially from the west. The vegetation communities of particular natural history interest in our study area include late succession deciduous forest, late succession mixed forest, bedrock outcrops and wetlands.

The woody vegetation of the site appeared to be in generally good condition, with minimal ice storm damage and signs of disease.

Sugar maple forests, with good representation of American beech and yellow birch forest are the most common forest communities along the north side of both the Beaver and Kizell Ponds and in Trillium Woods. This forest is younger further north of Kizell Pond and closer to the Goulbourn Forced Road, as well as in the southwest corner of the study area, south of the Kizell Pond and north of the former cattle grazing land to the north of the Nepean–Amprior Railway line. However, ironwood and black cherry associations are common in some portions of the forests in the north portion of the study area. Common associate tree species in the central portion of the site include white ash, red oak and basswood. Sugar maple trees (diameter at breast height (dbh) in the range of 70 cm) are representative of the larger trees in the more mature forest. Good regeneration of balsam fir and white cedar was noted in some areas, and portions of the forest west of Goulbourn Forced Road are reflected of mixed forest conditions rather than deciduous forest (Figure 1). The forests are representative of a relatively high overall floristic quality of the vegetation with a slightly degraded to intact landscape prior to tree removal in March and April of 2002, as described below. A typical percentage of non-native plant species (21 percent in 2002) for a natural area in Southern Ontario were observed.

Younger mixed forests are located east of the First Line Road allowance and south of the cattail marsh (Figure 1).

Small areas of bedrock outcrops are scattered throughout the forested areas, especially to the west of the Goulbourn Forced Road. The number of bedrock outcrops increases closer to the First Line Road allowance. The largest of these areas is approximately two hectares in size. Regionally significant plant species reported in this community by Brunton (1992) included rusty woodsia and maidenhair spleenwort.

The forested portions of the study area have had little site fragmentation. These pristine forested areas have high aesthetic qualities and provide a variety of wildlife habitat. Cattle grazing and other agricultural activity have had little impact on the more mature forests. However, there are a large number of trails, especially to the north of Kizell Pond, on the west side of the Goulbourn

Forced Road. Erosion was observed along many of these trails, apparently in association with mountain bike activity. Several mountain bike structures have been erected.

Tree cutting occurred in the early spring of 2002 between Goulbourn Forced Road and the First Line Road allowance. The tree cutting involved removal of approximately 2,200 stems of deciduous and coniferous trees ranging in average size for each species from 33cm to 97cm diameter at breast height. White ash, red maple, bur oak, white spruce, white elm, basswood and white cedar were the most frequently cut species. The majority of trees were removed in three general locations, as shown on Figure 2, among upland coniferous habitat south of the Kizell Pond and upland deciduous habitat north of the Kizell Pond to the west of the Goulbourn Forced Road, and among deciduous swamp habitat to the east of the First Line Road allowance. In addition to the actual removal of trees, damage of small tree stems and other vegetation was extensive as a result of the search for trees to be cut and the skidding of the harvested trees.

Recommendations

The NEA Lands

As detailed in the report titled *Kanata Lakes, NEA Boundary Definition, Shirley's Brook And Tree Cutting Mitigation* (November, 1992) by ESG International Inc, Natural Environment Area (NEA) lands have been defined for the site (Figure 1). The NEA lands include large tracts of deciduous and mixed forests north of Kizell Pond, and smaller cedar and deciduous forests on the south side of Kizell Pond. In addition to the core area of upland forest on the north side of Kizell Pond, major bedrock knolls were incorporated into the NEA lands. This provided retention of a variety of upland habitat benefiting both wildlife and the nature appreciation experience of the area. The NEA lands on the north side of the Kizell Pond was designed to be large enough to include a core protected forested area of a minimum of 10 hectares for area sensitive breeding birds.

With the exception of a woodland trail with a 1.2 –1.5 metres width of cedar chip surface and stormwater energy dissipators (Figure 2), no site alterations will occur within the NEA lands. The trail was roughed out in April, 2003, and was sited on stable land, where direct impacts such as tree removal would be minimal. Where possible existing recreational trails or damaged areas from the tree removal and subsequent skidding were utilized. The only area of the trail where existing impacts were relatively minor was in the north-central portion of the trail on the north side of Kizell Pond. In this location, approximately 300 metres in length, careful siting of the trail minimized removal of woody vegetation and small equipment such as small rubber tired shovels were used to minimize the width of disturbance. The existing stonedust pathway on the north side of the Beaver Pond is entirely within the NEA lands, and no new trail work will be undertaken on the east side of the Goulbourn Forced Road.

The locations of the energy dissipators have been fine-tuned to avoid more sensitive natural environment features. For example, the dissipator on the south side of the Kizell Pond was relocated to the west so the approach to the dissipator would avoid an area of rock outcropping and trees, and would not be visible from the natural lookout to the east. The approach to the

dissipator on the north side of the Kizell Pond, west of the Goulbourn Forced Road is located in an area with minimal woody vegetation. The recreational trail was relocated from the field-flagged locations to avoid conflict with both of these dissipators.

Figure 2 identifies coniferous plantings, such as white pine, white spruce, eastern white cedar and eastern hemlock to screen the dissipators from the recreational pathway. Moist border deciduous species such as ironwood, American beech and striped maple will be planted on the Kizell Pond side, creating a visual screen that will enhance cross-pond views and add to the diverse wildlife habitat. The vehicular access road to the outlets will be sinuous in character, preventing a clear line of sight at the trail crossing points. Trail crossings will occur at angles that further impede view lines. A vehicular turn-around will be provided at each outlet to allow service vehicles to exit in a forward direction, rather than backing up a winding road. The outlet on the south side of the Kizell Pond will be located at a low level that does not impede the sight line of the natural lookout location to the east.

The NEA lands will be protected by a buffer of 10 or 15 metres adjacent to the NEA boundaries. The extent of this buffer is a function of the vegetation communities and topography adjacent to the NEA boundary. For example, on the south side of the Kizell Pond, west of Goulbourn Forced Road, the recommended buffer is ten metres as the woody vegetation adjacent to the NEA lands is limited and the topography is gently sloping. On the north side of the Kizell Pond, approximately 300 metres west of Goulbourn Forced Road, the lands adjacent to the NEA boundary are generally forested and the topography is more undulating. In this location a 15 metre buffer has been utilized.

From a natural environment perspective, the function of the buffer is primarily to protect the edges of the NEA lands. The boundaries of the NEA lands have already taken into account a buffer to protect the more sensitive features such as the wetland habitats and steep slopes. Thus the buffer does not represent a setback from top-of-bank for example, but is an additional buffer from a boundary that already includes typical setbacks from the sensitive features.

Soil compaction and other potential impacts on the core of the root system of trees at the edge of the NEA lands should be avoided by restricting grading and other site alteration activities to outside of the buffers. If the recommended buffer is insufficient to protect an existing treed edge along the NEA boundary during construction, then the width of the setback should be increased. For example if blasting requirements dictate that a ten metre buffer will not adequately protect the root structure of the trees representing the existing forest edge then the setback must be increased. The extent of blasting in proximity to the buffer will be a function of the specific development plans for each lot (ie. the location of the building footprint) and the associated servicing requirements. In areas adjacent to the buffers where blasting is required, consideration should be given to pre-shearing the rock to create a crack between the trees' critical root zone perimeter (approximately 15 times the dbh of the trees) and the blasting work, and the ground around the trees adjacent to blast areas should be moistened to increase soil adhesion and assist in retaining root-soil contacts during blasting.

The vegetation and associated habitat along the edge of the NEA lands will be protected by the

buffer from any indirect impacts associated with the installation of services and other structures such as blasting and grading on the adjacent development lands. Although some impact on the vegetation within the outer portions of the buffer is anticipated from the adjacent blasting and grading, the balance of the vegetation within the buffer will protect the NEA lands. Any damage vegetation in the buffer will eventually regenerate in a natural state.

Along similar lines as above, the natural vegetation within the buffer will prevent a new forest edge from being created along the edge of the NEA lands. This will eliminate potential increases in indirect impacts such as wind throw and sunscald on the vegetation along the outer edges of the NEA.

Restoration of Tree Cutting Areas

The remediation of damaged areas as a result of the tree removal that occurred in March and April of 2002 and trail alignment around the Kizell Pond commenced in March 2003, and as of early April the cleanup was approximately 25% complete and the trail alignment is cleared but no surfacing, boardwalks or the like installed.

The timing for the site restoration work was ideal as the ground was still frozen, but the snow cover was generally gone. This reduced impacts such as rutting and damage to seedlings. The ongoing remediation includes the removal of woody debris and cutting down of stumps to improve the general appearance and reduce the volume of woody material left to decompose on the ground. There are reasonable populations of very small seedlings remaining in these denuded areas, which with the removal of canopy will put on rapid growth. To assist and diversify this remnant plant stock, planting of additional native tree and shrub species will accelerate the natural restorative process. Some debris will remain in delicate ecological areas and areas of low development impact, such as the south side of Kizell Pond in order to minimize the damage by large equipment in these wet and soft soil areas. In areas of high impact where removal of debris is necessary and the ground is high and dry, the debris has been chipped and spread over the impacted area to a maximum diameter of 10cm, and all material over 100cm diameter will be hauled off site. During the removal of woody debris, the use of heavy equipment was minimized to avoid as much as possible additional damage to regenerating deciduous and coniferous stems and ground cover vegetation.

Figure 2, completed by John Wright of Corush Sunderland Wright, identifies the woodland reinstatement. Reforestation will focus on the planting of native tree and shrub species that will re-establish the existing plant communities of the woodland, upland and wetland habitats. Upland areas of mixed forest, such as the areas southeast and southwest of Kizell Pond (immediately west of Goulbourn Force Road and immediately east of First Line Road allowance, respectively), will be reinstated with the planting of coniferous species such as white pine, white spruce, eastern hemlock and eastern white cedar, and deciduous species such as sugar maple, white oak, basswood and yellow birch. White spruce, eastern hemlock, sugar maple and basswood will be planted on the north and east facing slopes, with white pine, eastern white cedar, white oak and yellow birch on south and west facing slopes. Reforestation in these areas will be dense (planting at approximately 1.2 metres on centre) to establish the desired visual screen of the adjacent

residential development from the view of the recreational pathway. Low lying areas such as the region immediately west of the aforementioned area, and the flooded region west of Kizell Pond will be reinstated with plantings of white birch, black cherry, ironwood, American beech, striped maple and balsam fir. Striped maple, American beech and ironwood will be planted on the moist, shady lower slope portions, with white birch and black cherry on upper portions and balsam fir interspersed throughout. These species will also provide erosion protection for the more dramatic slope faces. Reforestation in these areas will be less dense (planting approximately three metres on centre) as the visual screen effect is not desired. These areas are identified on Figure 2, developed by Corush Sunderland Wright Limited.

The reinstatement will include site preparation and plantings of portions of the skidder trails created during the tree removal that have not been used as part of the recreational trail.

Tree Retention Outside of the NEA Lands

The concept plan and previous agreements permit an extensive amount of retention within the Natural Environment Areas as described above, including Trillium Woods and the lands adjacent to the Kizell Pond and north of the Beaver Pond. The NEA areas were selected to provide a variety of core habitats retained in the natural state. Thus the tree retention within the NEA lines will include coniferous, mixed and deciduous forests. Tree retention will also occur within the linkages and open space areas identified in the Concept Plan (Figure 1). The habitat to be retained in these areas include:

- deciduous forest of maple, ash and basswood in the open space to be preserved just south of the Nepean–Arnprior Railway line along the west edge of the site;
- deciduous forest of maple, ash and ironwood in the open space to be preserved on the east side of the Goulbourn Forced Road;
- mixed forest of cedar, maple and basswood in the open space to be preserved on the west side of the Goulbourn Forced Road;
- remnants of the deciduous forest of maple and ash on the west side of the new Goulbourn Forced Road alignment as part of the periphery of the proposed soccer pitches; and,
- portions of the deciduous forest north of the Beaver Pond as part of the linkages between the Beaver Pond and Trillium Woods to the north.

Retention of trees outside of the NEA and linkages areas will be difficult due to the typical urban area lot sizes and extensive bedrock near the surface throughout the study area. The bedrock will necessitate blasting for installation of the services. Due to the relatively shallow root network of the trees in response to the bedrock, the root area is likely extended. In addition trees in shallow soils are generally more susceptible to wind throw.

The above tree retention can be enhanced through:

- minimizing the extent of vegetation removal as much as possible in areas where the blasting and servicing requirements are minimized;

- where retention of regenerating stems will not be feasible due to their location in a lot, the seedlings should be considered for transplanting to provide a source of native trees as part of the rehabilitation of the NEA lands damaged by the tree cutting, along the realigned Shirley's Brook corridor, and where blasting, grading or construction access will require planting after development;

- to protect breeding birds, tree removal should not occur between May 15th and July 10th, unless a breeding bird survey is conducted and trees removed within five days of the survey.

- close cutting of existing vegetation during clearing as oppose to grubbing where woody vegetation removal is required for access or work areas only and no regrading or blasting is required, to encourage revegetation; and,

- additional planting of native trees on a lot by lot basis and along the realigned Shirley's Brook corridor, in addition to the rehabilitation described above. To provide a natural appearance, trees should be planted in a random, cluster fashion rather than in a grid system. Species present in the existing forests, as identified in the *Vegetation Communities* section above should be preferred.

Conclusions

The forested portions of the study area are dominated by mature and early successional deciduous forests with mixed and coniferous forests also present. The forests are representative of a relatively high overall floristic quality of the vegetation with a slightly degraded to intact landscape prior to the tree removal in March and April of 2002.

The NEA lands provide for retention of a core forested area, providing habitat for area sensitive birds in the west portion of the study area, as well as wetland habitats and associated upland forests throughout the study area.

Measures are provided to ensure that impacts on the NEA lands as a result of construction and implementation of the Concept Plan will be minimal. This includes establishment of buffers beyond the NEA boundaries. A recreational trail has been sited within the NEA lands, utilizing mostly existing trails and areas damaged by the tree removal. The trail has been designed and carefully sited to avoid notable tree removal and other potential impacts on the NEA lands.

The stormwater energy dissipators and access to the facilities were located to avoid more sensitive habitat and conflicts with the recreational trail. Plantings will be provided to screen the facilities.

Notable tree removal will occur outside of the NEA lands. Blasting and grading requirements, and the typical urban lot size, will restrict tree retention outside of the NEA lands to open space blocks identified in the Concept Plan. Although this represents a significant loss of natural function, the greatest diversity of natural features have been retained within the NEA lands. Given the extent of existing and proposed development in the vicinity of the Beaver Pond, an extensive natural linkage between the NEA lands along the Beaver Pond and Trillium Woods to the north is not required. Two smaller linkages in the concept plan will provide a recreational and some wildlife linkage to the north. Efforts should be concentrated on connecting Trillium Woods and the core NEA lands in the west part of the site to the core of the South March Highlands to the north.

References

Brunton, D.F. 1992. Kanata Lakes Study Area. Natural Environment Assessment. Prepared for Genstar Development Corporation and City of Kanata. February, 1992. 130 pp.

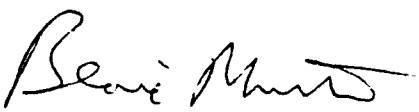
Brunton, D.F. 1992b. Life Science Areas of Natural and Scientific Interest in Site District 6-12. Unpublished Manuscript. 225 pp.

Brunton, D.F. 1997. Summary: Natural Area Reports for Natural Areas West of Rideau River (500 series). Prepared for the Regional Municipality of Ottawa-Carleton, Planning and Development Approvals Department. 164 pp.

Schut, L.W. and E.A. Wilson. 1987. The soils of the Regional Municipality of Ottawa-Carleton (excluding the Ottawa Urban Fringe). Report No. 58 of the Ontario Institute of Pedology.

Thank you for the opportunity to conduct this work. Please call if you have any questions on this Preliminary Tree Study and Conservation Plan.

Yours Sincerely,
MUNCASTER ENVIRONMEANTAL PLANNING



Bernie Muncaster
Principal

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WOODLAND REINSTATEMENT. KW #4

±3800 m.sq./ 420 PLANTS ON 3m CENTRES

RELOCATE EXISTING TRAIL

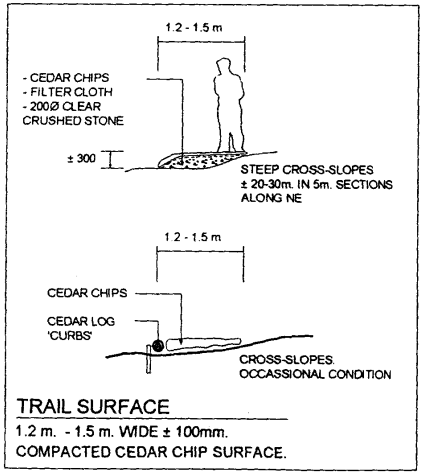
BLOCK EXISTING TRAIL DOWN STEEP SLOPE WITH LARGE LOGS TOP AND BOTTOM - SCARIFIES AND PLANT EXISTING SECTION OF TRAIL.
(STEEP SLOPE PRESENTS A BIKE / PED. HAZARD)

WOODLAND REINSTATEMENT KW #3

± 1100 m.sq. / 122 PLANTS ON 3m. CENTRE

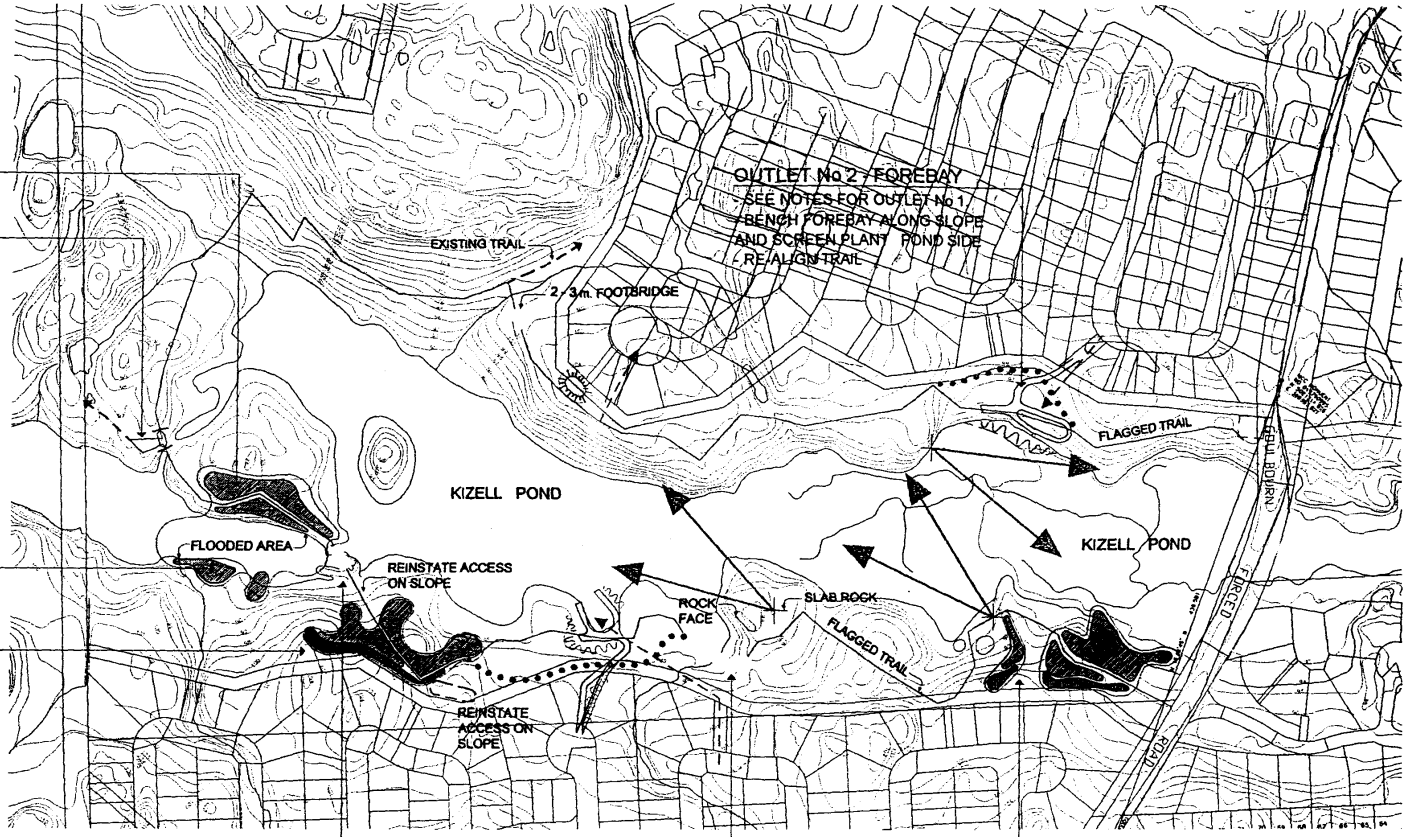
WOODLAND REINSTATEMENT KW # 1 & 2

± 550 m.sq. DENSE REFORESTATION BED (SOIL TILLED, MULCH, PLANTS ± 1200 O.C.) ALONG SUBDIVISION & TOP OF SLOPE.
± 2400 m.sq. REFORESTATION.
PLANTS ± 3m. APART & ±270 SEEDLINGS



TRAIL SURFACE

1.2 m. - 1.5 m. WIDE ± 100mm.
COMPACTED CEDAR CHIP SURFACE.



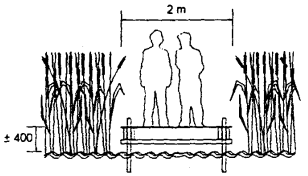
FOOTBRIDGE(S)

± 6 m. OF BRIDGE REQUIRED TO SPAN OUT FLOW. USE CEDAR STRINGERS WITH ROUGH CUT CEDAR DECKING
± 2 m. WIDE - LESS THAN 60 cm. FROM WATER.

OUTLET No 1. FOREBAY

- SINUOUS ACCESS ROAD - PREVENT CLEAR LINE OF SIGHT FROM TRAIL CROSSING
- CONIFEROUS SCREEN PLANTING BETWEEN FOREBAY AND TRAIL / SUBDIVISION.
- PROVIDE TURN-AROUND SO VEHICLES DO NOT HAVE TO BACK-UP ACCESS ROAD.
- THIS BAY IS LOWER AND OUT OF SIGHT OF NATURAL LOOK-OUT TO THE EAST.
- WILL REQUIRED RELOCATION OF PATH ALIGNMENT FROM FIELD FLAGGING.

BOARDWALK



BUILD BOARDWALK TO CROSS ± 50m. OF WET MEADOW.
WHILE NOT ACTUALLY WET IN SUMMER A GRANULAR PATH WOULD BE REQUIRED FOR SHOULDER SEASONS AND TO KEEP GRASS OPEN ON TRAIL.
THIS WOULD IMPEDE SURFACE DRAINAGE

WOODLAND REINSTATEMENT. KE# 1-4

±1000 m.sq. DENSE REFORESTATION BED - ALONG TOP OF SLOPE, ADJACENT SUBDIVISION ± 240 PLANTS ± 1.2 m. O.C.

±2300 m.sq. REFORESTATION - 260 PLANTS, 3 m. O.C.

Figure 2

KIZELL POND
Trail and Woodland Reinstatement concept.

CORUSH SUNDERLAND WRIGHT LTD
2 APRIL 2003 1:1500