ECOLOGICAL RESTORATION PLAN

for the

MILWAUKEE COUNTY GROUNDS

March 2005

MILWAUKEE COUNTY PARK SYSTEM

MMSD

Preserving The Environment • Improving Water Quality

ECOLOGICAL RESTORATION PLAN

for

THE MILWAUKEE COUNTY GROUNDS

MARCH 2005

SECTION 1 – THE PLANNING PROCESS

Introduction

The land use of the Milwaukee County Grounds has been a subject of great public interest for many years. In general, the interests and planning efforts started very broad and have become more detailed as projects and ideas have evolved. The first step was in the late 1990's when Milwaukee County led a major planning effort which culminated in the March 1999 Recommendations for the County Grounds report. The second step was in the period from 2000 to late 2003. During that time, three new projects - the proposed Milwaukee Metropolitan Sewerage District (MMSD) Floodwater Management Basin, the proposed Department of Natural Resources (DNR) Forestry Education Center, and the proposed Economic Development Area – resulted in more detailed plans being put together for the northeast quadrant of the County Grounds. Figure 1 shows the relative location of each of these projects. In addition, there is the area between the detention basin and economic development area termed the open space area. All of these projects/areas were considered in the January 2004 Planning and Design Considerations for the County Grounds Land Use Plan.

During the past year, more detailed planning occurred in and around the proposed MMSD floodwater detention basin and the area termed the Open Space Area, where most of the fill from the detention basin will be placed. The Landscape and Ecological Plan outlined in this report was developed from that planning process.

Summary of the January 2004 Planning and Design Considerations Report

Because the recommendations of this report build directly on the 2004 Planning and Design Considerations report, it is useful to summarize that planning process for the northeast quadrant and its subsequent recommendations.

Stake Holder Interviews. A series of individual interviews and group meetings with key stake holders were conducted in the fall of 2003 to develop an integrated assessment of all the proposed projects in the northeast quadrant of the County Grounds and their conformity with broad planning objectives. The stake holder issues were addressed to the greatest extent possible at this stage of the conceptual planning process. The stake holders interviewed included:

Laurie M. Albano	Milwaukee Co. Parks
Bridget Bannon	Office of Persons with Disabilities
Don Natzke	Office of Persons with Disabilities
Therese Gripentrog	WI Dept. of Natural Resources
Don Tills	WI Dept. of Natural Resources
Wendy McCown	WI Dept. of Natural Resources
Dennis Lukaszewski	UW Extension – Urban Ag.
Nancy Welch	Director of Community Development, City of Wauwatosa
Linda Cutler	Milwaukee Regional Medical Center
Tom Chapman	Milwaukee Metropolitan Sewerage District
Karen Sands	Milwaukee Metropolitan Sewerage District
Craig Dillmann	Milwaukee County Real Estate
Bill Hatcher	Milwaukee County Economic Development (retired)
Guy Mascari	Milwaukee County Research Park
Donna Weiss-Priebe	Kubala Washatko Architects, Inc.

Initial Public Involvement meetings. The purpose of the first meeting was to present the public with information pertaining to land use decisions that had been made, and to seek input on upcoming decisions regarding coordinated use of the NE Quadrant of the County Grounds. The meeting was coordinated by Milwaukee County, MMSD and DNR and held on November 6, 2003.

Attendees represented people who live in nearby neighborhoods and groups who are users of the grounds, including the developers, business owners, walkers, recreation supporters and elected officials.

General Planning Goals. The following list represents, in random order, site and operational issues, design considerations and constraints, comments and concerns that stake holders wished to have addressed in the planning process. Some of these comments relate to the physical plan development process and specific site planning elements while others are more detailed and implementation / operations oriented items.

1. Roadway connections to Underwood Creek Parkway should be minimized.

2. Roadway connections to Swan Boulevard should be minimized.

3. Roadway connections to Watertown Plank Road should be coordinated with MRMC and their master plans.

4. Replace 2 soccer fields, archery range and 6 tennis courts. These may be off site as determined by Milwaukee County Parks.

5. One maintenance building needs replacement and could possibly be located in the northwest quadrant.

6. Accommodate UW Extension garden relocation.

7. Plan for handicapped accessible garden area near Camp Will-O-Way.

8. Consider adaptive reuse for the Eschweiler buildings.

9. Public transportation (MCTS) should serve the site, connecting all land use areas.

10. Add buildings of the same scale and architecture to the Eschweiler cluster.

11. The site needs to be readily accessible for public safety. A loop road system for fire and police protection should be considered.

12. Avoid all cemetery areas.

13. If any land is to be owned or maintained by Milwaukee County Parks, minimize maintenance requirements through design.

14. Consider "self contained" electrical generating system (wind / solar combination) for the site

15. DNR could utilize space in Camp Will-O-Way (or build a small addition) for administration and/or classes, while the Education Center is being planned and constructed.

16. Avoid Butler's Garter Snake habitat.

17. All grading and grade transitions should look natural not "engineered."

18. Consider pedestrian connections from Hoyt Park to the County Grounds.

19. Improve bike connection from Hoyt Park to Underwood Creek Bike Trail.

20. Develop open space (landscaping, grading and stormwater management elements) with a very naturalistic approach.

21. Consider innovative ways of handling stormwater from the economic development area.

22. Configure all designs to preserve, to the greatest extent possible, the unique natural plant communities identified by SEWRPC

23. No trails should enter the detention basin.

24. Trails should skirt the top edges of the detention basin and could even meander in and out of the basin proper at the upper level.

25. Make sure the Economic Development Area has its own stormwater management system that does not drain to the large detention basins to the north.

26. Allow for future WE Energies expansion to the north.

27. Consider a separate area for dog walkers. This area needs to be fenced to keep unleashed dogs from interfering with other open space users.

28. All public areas (buildings and parking) of grounds must be ADA compliant.

29. Establish a hierarchy of trails with main connecting trails being ADA compliant (asphalt, concrete or fibar)

30. Consider whether the use of mountain bikes within the area will be allowed and if they are, where would that activity be best located.

31. Consider a possible skateboard park.

32. Consider strong use connections between Forestry Education Center and Camp Will-O-Way, especially food services.

33. Explore the economic benefits of utilizing fill generated by the detention basins.

34. Plan for approximately 850,000-950,000 square feet of building space in the Economic Development Area.

35. Consider “view sheds” when determining where and how fill material might be graded.

36. Integrate pedestrian movement systems throughout the various activity and development areas.

37. Plan for land uses within the economic development area that are compatible and complimentary with the SE and SW quadrants.

38. Keep Economic Development Area as close as possible to previously designated development area (Plank Road Park – Sept. 2001).

39. Don’t disrupt the day care center.

40. Maintain parking on the same side of the road as the Day Care Center.

41. Create a visual gateway by reforestation of the south side of Swan Boulevard. The view as a driver emerges from the forested area would be more dramatic.

42. Create a synergistic mix of land uses in the Economic Development Area (limited retail, service, restaurant, offices and residential)

43. Cluster buildings in the Economic Development Area. Create a high density area utilizing some 6-8 story buildings. Allows for more open space within the development area.

44. Need a road connection from Economic Development Area to Swan Boulevard.

Many of these general planning principles are shown on Figure 2.

Future Recreational Activities. In addition to these general goals, specific objectives for the central open space area were articulated. The central open space area is a transitional area between the detention basin and economic development area. The potential development of active and/or passive recreational facilities ultimately depends on who owns and manages the property. The public involvement process for this project confirmed the community's preference for keeping this space open with a minimum of future hard surfaces such as roads and parking areas. The public involvement process also identified numerous potential uses that could be a part of this open space. Although the land use plan discussed later in this report does not specifically show any of these facilities it does not preclude them as a future use.

1. Soccer fields – These will be considered for inclusion in this area. MMSD is required, by agreement with Milwaukee County, to fund the replacement of two soccer fields as a part of the construction of the detention basin. The exact location for the two soccer fields is a Milwaukee County decision and is still being studied, including locations other than the northeast quadrant of the County Grounds. These fields may better serve the public if they were located on other county owned park land.

2. Tennis courts – Funding of the replacement of the tennis courts (6) is another requirement of the agreement between Milwaukee County and MMSD. The actual location of the replacement tennis courts is a Milwaukee County decision and is still undetermined. A location at Hart Park or some other County park is being considered.

3. Archery range – The existing archery range may be relocated somewhere within the general community. It may be in the central open space if it is later determined it would serve the public best in that location.

4. Mountain biking – This is a rapidly growing sport that some of the public seem to think belongs in this area. It was generally agreed upon by the Northeast Quadrants Study committee that this type of facility generally belongs in a much larger and more linear facility. Mountain bikers prefer to travel through natural areas of varying terrain in a linear fashion and not in a loop route on a relatively small parcel such as the central open space. Mountain bike trails are high maintenance items and the activity of mountain biking would also conflict with the passive uses of the area such as the forestry education center.

5. Dog walking – The walking of dogs on leash can generally be accommodated in any type of open space, so legal dog walking within the central open space may still be an activity that the residents of the area can engage in.

6. Skateboard facility – The public input indicated that this type of facility should not be included in the open space portion of the County Grounds.

The Pedestrian Circulation and Roadway Access, Figure 5, indicates the general locations of connection points for site circulation. Actual roadway, pedestrian paths

and bikeway locations will be evaluated and designed on subsequent site development plans for the areas. Planners and engineers of these circulation systems should refer to this exhibit to design continuity into the system and make smooth transitions between land use areas.

Planning Activities Associated with the 2005 Ecological Restoration Plan

Conceptual plans continued to evolve during 2004 and early 2005 with attention being paid to the grading of the basin, disposal of the excess soil from the basin excavation and vegetative restoration and plant material selections. A design workshop was conducted at the MMSD offices in the spring of 2004 to assist the consultants in the development of the Ecological Restoration Plan. Participants, including the County, City of Wauwatosa, three different environmental and park advocacy groups, and the WDNR worked in small groups and developed goals and plan alternatives for the site. A general consensus was reached that the basins need to be naturally contoured with gentle side slopes, the fill area also needs to be naturally contoured to reflect natural land forms and that revegetation of the fill site and basins needs to look natural.

The design workshop was followed by an on site review of the concepts in the spring of 2004. Attendees walked the site and viewed specific areas including the fill and basin areas and evaluated the plan options developed earlier. Based upon these design activities alternative plans were able to move forward with more detail given to the specifics of site grading.

Preliminary grading plans were refined based upon the design workshops and field meetings. A conceptual revegetation plan was also completed, critiqued by stakeholders, revised and presented to the public at a public involvement meeting held at Hart Park on January 13, 2005.

SECTION 2 – OPPORTUNITIES AND CONSTRAINTS

Planning Opportunities

The four main areas for planning consideration are the detention basin, open space area, economic development area and the DNR property. The functions of these areas will be fitted within the site's physical constraints. The two areas of immediate attention for the development of the Ecological Restoration Plan are the basin and open space area.

All four areas will compliment each other in their functions. The basin will support a variety of plant life as well detaining floodwater from Underwood Creek. A variety of native trees and shrubs will be planted along the upper edge of the basin areas and will be accessible to the public. The variety of native tree woody plants can be an extension of some of the Forestry Education Center exhibits and demonstration areas.

The area south of Swan Boulevard will hold the excess soil excavated from the detention basin. This area offers an opportunity to create a varied landscape with an undulating topography supporting a variety of plant communities.

Plans for the open space area also propose an area graded level so that a variety of "active recreation" uses could be accommodated in the future.

Final designs for each of the four areas should utilize the concepts set forth in this document to coordinate individual site development plans. Compatible land uses, grade transitions and a contiguous circulation system should be the final result of implementing the ideas as presented in the plans.

Planning Constraints

The site has a number of natural and cultural considerations that constrain the extent to which development / recreational activities may occur. In the late 80's and 90's three separate land use plans and studies for the County Grounds were prepared. In addition to the land use plans, a number of archeological, environmental and soils studies were completed within the past 6 years. The historical / archeological and natural inventories were conducted to ensure that natural and manmade resources have been identified in terms of their significance and can be planned around where required. The existing conditions and special features as outlined in the following list of reports are summarized on Figure 3. The following is list of those land use plans and cultural / natural resource inventories and reports.

LAND USE PLANS

1. Supplement to the Milwaukee County Grounds Land Use Study of 1989, Engberg Anderson Design Partnership and Vandewalle, December 1996

2. A Park and Open Space Plan for the City of Wauwatosa, SEWERPAC, March 1998

3. Milwaukee County Land Use Planning Committee Recommendations for Milwaukee County Grounds, March 1999.

ARCHAEOLOGICAL SURVEY

4. Phase 1 Archeological Survey in the Northeast Quadrant of the Milwaukee County Grounds, David Overstreet, Center for Archaeological Research at Marquette University. October 2000.

5. Archaeological Investigations of Milwaukee Metropolitan Sewerage District Development Areas, Milwaukee County Grounds, Wauwatosa, Wisconsin, UWM Archaeological Research Laboratory, Historic Resource Management Services, January 2001.

ENVIRONMENTAL ASSESSMENT & ANALYSIS

6. Phase I Environmental Site Assessment, Milwaukee County Grounds Parcels B, C, and D, K. Singh & Associates, November 2000

7. Phase II Environmental Site Assessment, Milwaukee County Grounds Parcels B, C, and D, K. Singh & Associates, November 2000

8. Feasibility Study and Environmental Analysis for the Milwaukee County Grounds, Wisconsin Department of Natural Resources, Draft January 2001.

9. Environmental Assessment for the Milwaukee County Grounds Detention Basin Project, Menomonee River, Tetra Tech, Draft March 2001 (includes Wetlands Delineation Findings)

10. Phase I Environmental Site Assessment, Milwaukee County Grounds, Seymour Environmental Services, Inc. January 2002.

11. Milwaukee County Grounds Butler's Garter Snake Environmental Assessment for MMSD, Casper Consulting, December 2000

SOIL INFORMATION

12. Geotechnical Investigation Report Milwaukee County Grounds Parcels B, C, and D,
K. Singh & Associates, November 2000

13. Additional Investigation Report Milwaukee County Grounds Parcels B, C, and D, for the County Department of Public Works, K. Singh and Associates, October 2001.

14. Field Investigation Report, Milwaukee County Grounds West, Kapur & Associates, November 2001

15. Field Investigation Report, Milwaukee County Grounds East, Kapur & Associates, November 2001

The following observations on the natural, cultural, archeological features have been incorporated into the conceptual Landscape and Ecological Plan.

1. Existing Wetlands
Tetra Tech and Natural Resources Consulting were contracted by MMSD to conduct a wetland delineation in the study area. Their site reconnaissance located the eight wetland areas previously identified by SEWRPC, and also found additional wetlands. None of the wetlands within the area to be graded are considered to be highly valuable for wildlife habitat, stormwater attenuation, water quality protection, groundwater discharge/recharge or aesthetics.

2. Existing Wooded Area
In fall of 2000, SEWRPC reported that in general "the vegetation observed on the site reflects past intensive agricultural use and consists mainly of cultivated garden plots, old fields dominated by weedy forbs and grasses, and a few small isolated wooded patches containing mostly exotic species and weedy native plants."
Because of the past agricultural use and development, very few of the habitats are undisturbed.

3. Vegetation to be Preserved
Wil-O-Way Woods, a 42-acre southern dry-mesic hardwoods woodland, is designated as a Natural Area of local significance, as well as a Class II wildlife habitat. These woods will not be affected by the proposed grading.

   Other vegetation to be preserved was selected based on aesthetic value, and includes some pine and spruce groupings south of Swan Boulevard, an oak stand in the vicinity of the drainage basin as it flows under Swan Boulevard (north of basin, east of Swan

Boulevard), and trees that help to block views of WE Energies along the south side of the property.

4. Existing Cemeteries
   The 2001 UWM Archaeological Investigation confirmed that burials in 47 BMI-0174, the western cemetery, appear to be restricted to the heavily wooded rise portion of the cataloged location. This cemetery was used for a short time, possibly 1925 to 1927, by Milwaukee County Institutions, and could contain approximately 150 to 300 bodies.

   The eastern cemetery (47 BMI-0075) has relatively well-known boundaries and is presently delimited by a fence. This 3.8 acre site was used as a burial ground for paupers from approximately 1925 to 1974, and could hold up to 4,000 bodies.

   Both cemeteries will be avoided.

5. Area Containing Threatened Species (Forked Aster)
   SEWRPC conducted vegetation surveys of this area from 1975 through 1998. The area which contains the Forked Aster (Aster furcatus) is designated as an Isolated Natural Resource Area. The Forked Aster is a State Threatened Species, and this area will not be affected by the proposed grading.

6. Area Containing Special Concern Species (Wafer Ash)
   SEWRPC conducted vegetation surveys of this area from 1975 through 1998, and observed the wafer ash (Ptelea trifoliate) as a special concern species west of Underwood Parkway. A special concern species is a non-legal category that includes species not designated as threatened or endangered, but about which some problem of abundance or distribution is suspected but not yet proved. This area will not be affected by proposed grading.

7. Butler's Garter Snake Habitat
   The Butler's Garter Snake (Thamnophis butleri) is a State Threatened Species. Its habitat in the site area appears to be concentrated along the railroad corridor abutting the south bank of the Menomonee River. Unmowed fields, overgrown savanna remnants, and drainage ditches provide sufficient habitat to sustain small populations of this species. This habitat will be avoided.

8. Archaeological Survey Area (MMSD- 2001)
   This study found no previously unreported prehistoric cultural resources in the project area.

9. Archaeological Survey Area (Marquette University- 2000)
   This study looked at the 125 acre tract as shown on Figure 3, and did not find any evidence of sites or properties potentially eligible for the National Registry of Historic Places.

   There is a “suspected cemetery” north of the Eschweiler Buildings (in the Economic Development Area), and earth-moving activities in this area should take appropriate mitigative measures, in consultation with the Burial Sites Preservation Office.

SECTION 3 – PLAN ALTERNATIVES FOR BASIN AND OPEN SPACE

Development of Topography / Landforms

During the conceptual design process in 2003-2004 three distinct grading plan alternatives were explored. The first grading alternative was very utilitarian in its approach. The main purpose of the first grading plan was to determine if 1.5 - 2 million cubic yards of fill could be distributed in the "fill area" in a reasonable manner without creating extreme slopes and grade changes.

This initial alternative developed (Figure 4) indicated a three tiered approach to the grading of the site. The economic development area would be the highest area with variable elevations for buildings and parking areas to avoid a "plateau" appearance. The grade from the economic development will gradually transition to an intermediate open space that could contain some active recreational areas. Finally the open space would transition to the lowest elevations which include the basin area.

The first alternative was evaluated from both an engineering and aesthetic point and judged to be too "engineered" in its appearance. A second alternative grading plan was prepared that created a more natural land form "hill top" in the fill area with gradual grade transitions sloping toward the detention basins. Natural drainage patterns would be preserved wherever possible in this alternative. This grading plan was critiqued over a two to three month period and there was a general consensus that this plan still did not reflect natural landforms in size, shape and slope.

The third alternative grading plan, illustrated in Figure 2, was developed after a series of workshops and field visits. The main goal of this alternative was to emulate natural land forms incorporating low poorly drained areas, meandering drainage courses and hilltops of various elevations. The area, in general, will transition to the detention basin with variable slopes no greater than 4:1 slope. The result will be a more natural aesthetic appearance that will be enhanced by the ultimate revegetation of the site.

Development of Revegetation Guidelines

The revegetation of all the disturbed soil was a primary concern of all the stake holders. In the design workshops and conceptual plan development process a preference was expressed to have all new vegetation on the site resemble natural Wisconsin landscapes. As a result of the focus on revegetation, a task force of landscape architects from the County Parks, Department of Natural Resources, HNTB and MMSD was formed to evaluate and make recommendations as to the type of vegetative restoration to occur on the site after final grading. The task force made specific recommendations for plant community areas and the species to be planted in those vegetative zones. The recommended plant list appears in the Appendix.

The task force also produced recommendations for maintenance of these areas to ensure a healthy plant community would be established.

SECTION 4 – SELECTED ECOLOGICAL RESTORATION PLAN

The conceptual Ecological Restoration Plan, illustrated in Figure 6, is the culmination of grading and landscape design alternatives developed from March through June 2004, public involvement, and evaluation of those alternatives. The conceptual Ecological Restoration Plan does not preclude certain active recreational pursuits while creating an ecologically sound open space that blends with and enhances the surrounding land uses of the basins, Forestry Education Center, Economic Development area and adjoining neighborhoods.

Pedestrian and Vehicular Circulation

Pedestrians will have access to the perimeter of the detention basin after the completion of a service drive / pedestrian trail roughly following the top edge of the basin as shown in Figure 5. This drive will serve as a pedestrian link to the areas on either side of Swan Boulevard, allowing pedestrians to pass under the roadway once a new bridge is in place.

Vehicular access to the center of the fill area will be via the extension of North 87th Street into the site, terminating at the eastern edge of the Potential Active Recreation Area as shown in Figure 6.

The grades proposed within the fill area will accommodate walking trails if they are desired as some later date. It is the intention to allow future trails to interconnect the service drive / pedestrian trail with the Forestry Education Center, active recreation area, economic development area and the natural plantings of the fill area.

Stormwater Management

Stormwater within the open space area will be managed on site through a series of low areas that will collect stormwater allowing that water to infiltrate as well as drain off in meandering surface drainage swales.

The economic development area will require a stormwater management plan to contain and manage any increase in stormwater runoff.

The fill area will be graded to create a topographically diverse area with land forms similar to a Wisconsin glacial landscape. These land forms will include meandering drainage ways, well drained hilltops and poorly drained depressions all of which will support a wide variety of natural plant materials.

Revegetation Plans

The revegetation of the newly planted landscape in the basin area and fill area will include 7 distinct vegetative communities as shown in Figure 6. Those communities include:

1. Pond Shelf
   The pond shelf is an aquatic shallow-water, emergent area surrounding the stilling pond, and is recommended as a safety feature. A mixture of tubers is recommended for this area: pickerel weed, soft-stem bulrush, river bulrush, arrowhead, and cattails.

2. Pond Edge
   The pond edge is the area directly behind the pond shelf. Plantings are recommended to discourage people from walking up to the water's edge and also to discourage geese. Plantings will consist of perennials and woody shrubs.

3. Demonstration Mesic Prairie
   The Demonstration Mesic Prairie is to be located near the Forestry Education and Awareness Center, on the northwest side of the west basin. This area will be used by the DNR for educational purposes.

4. Wetland Area
   This is the area that runs longitudinally along the bottom and roughly along the center of the basin. This area will likely be frequently wet or moist due to overland water flow.

5. Basins Bottom & Low Area
   The basin area between the wetland area and the basin side slope area will be planted with forbs and grasses. The same plant material will be utilized in the drainage swales of the fill area. These areas will occasionally be underwater and may remain wet for a short time after a rain.

6. Basin Side Slope
   The side slope areas will be quite dry and well drained and will support forbs and tall grasses that require less water.

7. Upland Fill Area
   The upland fill area will be mostly medium height grasses with a few forbs. This area will have a very natural appearance but with less diversity of species as in the other planting zones.

Selected planting of trees and shrubs may occur in various planting zones such as the Upland Fill, Basin Side Slope and Pond Edge areas. The use of native trees and shrubs will enhance the undulating terrain, screen objectionable views and frame other views. Tree plantings will also help to define outdoor spaces or use areas whenever possible.

Preservation of Key Resources

The preservation of key resources includes specific groupings of trees along Underwood Creek Parkway west of Swan Boulevard, a stand of oaks southeast of the railroad bridge over Swan Boulevard and the existing tree cover in the small cemetery east of the multiple use area.

Other vegetation to be preserved was selected based on aesthetic value, and includes pine and spruce groupings south of Swan Boulevard and trees that help screen views of WE Energies along the south side of the property northeast of the Parks Administration building.

The Butler's Garter Snake habitat along the south side of the existing railroad will be protected during construction and landscaping of the basins.

Multiple Use Area

The multiple use area located between the basin and the fill area east of Swan Boulevard has been graded level and is intended to accommodate active recreational uses. This area avoids the existing cemetery to its east and has vehicular access from Watertown Plank Road at North 87th Street. This area is graded in two tiers sloping from west to east. There is one drainage swale to the west of the multiple use area that picks up natural runoff from the west and directs it to the north and a second swale on the south that directs runoff to the east.

Future programming and planning for the multiple use area will determine the exact recreational uses to be located within the area.

SECTION 5 – MAINTENANCE PLAN

Maintenance of the revegetated basin will have the oversight of the DNR. The first five years of maintenance of the basin and open space area will be the responsibility of MMSD. After the first 5 years the maintenance of the basin will continue to be the responsibility of MMSD and the open space area will be maintained by the Milwaukee County.

This section outlines maintenance requirements necessary for the implementation of the recommended plan. Both the short and long term maintenance of this area are critical to the success of this area becoming an integral part of the overall function of the Milwaukee County Grounds. The first five years of maintenance will be critical in establishing the wide variety of plantings to be installed. Once the plantings have become well established the long term maintenance will continue to eliminate invasive species and keep the plantings in a healthy condition to be enjoyed by the public.

Basin Bottom, Wetland, Side Slope Bottom, Upland Fill and Mesic Prairie

Newly planted areas shall be mowed three to four times the summer following installation, and once if needed during the second year. Mow to a height of 6" minimum. After the second year, mowing shall only occur between November 1st and March 15th. Winter-mow when ground is dry with bat-wing mower. In the second through fifth years, spot herbicide to keep invasive species under control. If failure of seed in basin occurs, and re-seeding is necessary, the same mowing schedule applies to re-seeded areas for the first two years.

Basin Perimeter

The Basin Perimeter consists of the area at the top of basin slopes and extends to the perimeter access road and disturbed area just outside of perimeter access road. A maximum of 25% canopy cover is recommended. Large shrubs should not be located near perimeter access road, and open views must be maintained.

All woody plant material shall be pruned once a year to develop and maintain a proper habit of growth. Mowing should not occur at all on the perimeter, including around perimeter access road, unless a blind spot develops. No woody species should be planted within 10' of perimeter access road and a 3' clear zone will be mowed on either side of the road.

Monitoring protocol for Floodwater Management Facility

Representatives of County Parks, DNR, MMSD should meet every October or November to do a visual survey and report on the status of revegetation and invasive species. Invasive woody species, other than willows and dogwoods, will need to be removed on an annual basis through mowing or spot herbicide treatment so they do not become more difficult to control. Woody species should not be allowed to

develop into seed producing size. It is assumed that volunteer species will crop up in the Floodwater Management Facility, and that the basins will not be a native species environment forever. However, a reasonable effort should be made to help control reed canary grass and other invasive species. One possible mechanism for achieving this aim is periodic flooding of the reed canary grass through the use of a floodwater control mechanism.

SECTION 6 – SUMMARY AND FUNDING

The years of design exploration and public input for the Milwaukee County Grounds were invaluable in crafting the conceptual plan for this area and have culminated in the conceptual Landscape and Ecological Plan as delineated in Figure 5. The lands will be a focal point for the surrounding community and will preserve valuable open space in a highly urbanized area.

The naturalistic treatment of both the grading and the planting of a diversified landscape will create an aesthetically appealing open space to be enjoyed the community. Future recreational programming and planning will determine the future of active recreation in the fill area.

The continued involvement of the County Parks, MMSD and DNR will insure the future success of this significant urban open space.

The MMSD will completely implement the portion of this plan in and immediately around the detention basin, with oversight from the WDNR. The implementation of the plan for the Open Space Area will be shared between the MMSD and Milwaukee County. The following table summarizes the relative commitments and cost of each party for the Open Space Area.

Plan Element	Responsible Entity	Estimate Cost
Final Grading (50 acres)	MMSD	$300,000
Top Soil Placement/Soil Preparation (50 acres/25,000 CY)	MMSD	$100,000
Natural Seeding (50 acres)	MMSD	$150,000
Trees (1,000)	Milwaukee County	$200,000
Five –year vegetation maintenance	MMSD	$100,000
Ongoing maintenance after first five years	Milwaukee County	$50,000

A P P E N D I X

Recommended Plant Materials

Figures 1-6

RECOMMENDED PLANT MATERIALS

BASIN BOTTOM / LOW AREAS

FORBES

Scientific Name	*Common Name*
Asclepias incarnata	Red Milkweed
Asclepias syrica	Common Milkweed
Aster novae-angliae	New England Aster
Cacalia suaveolens	Sweet Indian Plantain
Eryngium yuccifolium	Rattlesnake Master
Eupatorium purpureum	Purple Joe-Pye Weed
Helianthus grosseserratus	Saw-tooth Sunflower
Liatrus spicata	Marsh Blazing Star
Monarda fistulosa	Wild Bergamot
Oenothera biennis	Evening Primrose
Pycnanthemum virginianum	Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Rudbeckia triloba	Brown-eyed Susan
Silphium integrifolium	Rosinweed
Silphium perfoliatum	Cup Plant
Solidago rigida	Stiff Goldenrod
Thalictrum dasycarpum	Purple Meadow Rue
Verbena hastata	Blue Vervain
Veronica fasciculata	Ironweed
Veronicastrum virginianum	Culver's Root
Zizia aurea	Golden Alexander

LEGUMES

Scientific Name	*Common Name*
Astragalus canadensis	Canada Milk Vetch
Baptisia leucantha	White Wild Indigo
Desmodium canadense	Canada Tick Trefoil
Lespedeza capitata	Round-headed Bush Clover
Petalostemum purpureum	Purple Prairie Clover

GRASSES

Scientific Name	*Common Name*
Andropogon gerardii	Big Bluestem
Andropogon scoparius	Little Bluestem
Bouteloua curtipendula	Side-oats Grama
Calamagrostis canadensis	Blue Joint Grass
Elymus candensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass

SEDGES

Scientific Name	*Common Name*
Carex stipata	Fox Sedge

BASIN SIDE SLOPES

FORBES

Scientific Name	*Common Name*
Asclepias syrica	Common Milkweed
Aster novae-angliae	New England Aster
Heliopsis helianthoides	Early Sunflower
Monarda fistulosa	Wild Bergamot
Oenothera biennis	Evening Primrose
Penstemon digitalis	Smooth Penstemon
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Rudbeckia triloba	Brown-eyed Susan
Solidago rigida	Stiff Goldenrod
Zizia aurea	Golden Alexander

LEGUMES

Scientific Name	*Common Name*
Astragalus Canadensis	Canada Milk Vetch
Desmodium canadense	Canada Tick Trefoil
Petalostemum purpureum	Purple Prairie Clover

GRASSES

Scientific Name	*Common Name*
Andropogon gerardii	Big Bluestem
Andropogon scoparius	Little Bluestem
Bouteloua curtipendula	Side-oats Grama
Elymus candensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass
	Red Top Grass
	Annual Rye

WETLAND

FORBES

Scientific Name	*Common Name*
Angelica atropurpurea	Great Angelica
Aster novae-angliae	New England Aster
Cacalia suaveolens	Sweet Indian Plantain
Chelone glabra	Turtlehead
Eupatorium perfoliatum	Boneset
Eupatorium purpureum	Purple Joe-Pye Weed
Helenium autumnale	Sneezeweed
Helianthus grosseserratus	Saw-toothed Sunflower
Liatrus spicata	Marsh Blazing Star
Lobelia siphilitica	Great Blue Lobelia
Oenothera biennis	Evening Primrose
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Rudbeckia triloba	Brown-eyed Susan
Silphium perfoliatum	Cup Plant
Thalictrum dasycarpum	Purple Meadow Rue
Verbena hastate	Blue Vervain
Vernonia fasciculate	Ironweed
Veronicastrum virginianum	Culver's Root

LEGUMES

Scientific Name	*Common Name*
Desmodium canadense	Canada Tick Trefoil

GRASSES

Scientific Name	*Common Name*
Andropogon gerardii	Big Bluestem
Calamagrostis Canadensis	Blue Joint Grass
Elymus candensis	Canada Wild Rye
Glyceria grandis	Reed Mana Grass
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass
Spartina pectinata	Prairie Cord Grass

SEDGES

Scientific Name	*Common Name*
Carex bebbii	Bebb's Sedge
Carex comosa	Bristly Sedge
Carex crinita	Fringed Sedge
Carex hystricina	Bottlebrush Sedge
Carex vulpinoidea	Brown Fox Sedge
Scirpus atrovirens	Dark Green Bullrush
Scirpus cyperinus	Wool-grass
Scirpus validus	Great Bulrush

DEMONSTRATION MESIC PRAIRIE

FORBES

Scientific Name	*Common Name*
Allium cernuum	Nodding Pink Onion
Asclepias syrica	Common Milkweed
Aster azureus	Sky-blue Aster
Aster laevis	Smooth Blue Aster
Aster novae-angliae	New England Aster
Coreopsis palmate	Prairie Coreopsis
Echinacea pallida	Pale Purple Coneflower
Eryngium yuccifolium	Rattlesnake Master
Helianthus occidentalis	Western Sunflower
Heliopsis helianthoides	Early Sunflower
Kuhnia eupatoroides	False Boneset
Listrus aspera	Rough Blazing Star
Liatrus pycnostachya	Prairie Blazing Star
Monarda fistulosa	Wild Bergamot
Oenothera biennis	Evening Primrose
Penstemon digitalis	Smooth Penstemon
Potentilla arguta	Prairie Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Rudbeckia triloba	Brown-eyed Susan
Silphium integrifolium	Rosinweed
Silphium laciniatum	Compass Plant
Silphium perfoliatum	Cup Plant
Silphium terebinthinaceum	Prairie-dock
Solidago rigida	Stiff Goldenrod
Solidago speciosa	Showy Goldenrod
Thalictrum dasycarpum	Purple Meadow Rue
Tradescantia ohiensis	Spiderwort
Vernonia fasciculata	Ironweed
Veronicastrum virginianum	Culver's Root
Zizia aurea	Golden Alexander

LEGUMES

Scientific Name	*Common Name*
Astragalus canadensis	Canada Milk Vetch
Baptisia leucantha	White Wild Indigo
Desmodium canadense	Canada Tick Trefoil
Desmodium illinoensis	Illinois Tick Trefoil
Lespedeza capitata	Round-headed Bush Clover
Petalostemum candidum	White Prairie Clover
Petalostemum purpureum	Purple Prairie Clover

GRASSES

Scientific Name	*Common Name*
Andropogon gerardii	Big Bluestem
Andropogon scoparius	Little Bluestem

Bouteloua curtipendula	Side-oats Grama
Elymus candensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Sorghastrum nutans	Indian Grass

GRASSES cont.

Scientific Name	*Common Name*
Sporobolus heterolepis	Priaire Dropseed

SEDGES

Scientific Name	*Common Name*
Carex bicknelii	Prairie Sedge

UPLAND FILL AREA

GRASSES
Perennial Rye
Timothy Grass
Canada Wild Rye
Switch Grass
Orchard Grass

FORBS
Black-eyed Susan
Showy Goldenrod
Yellow Coneflower
Oxeye Sunflower
New England Aster
Purple Prairie Clover

Trees and Shrubs

Swamp White Oak
White Oak
Red Oak
Burr Oak
Sugar Maple
Red Maple
White Ash
Hackberry
American Basswood
Downy Hawthorn
Dotted Hawthorn
Cockspur Hawthorn
Plum-leaf Hawthorn
American Elms (disease resistant)
Shagbark Hickory
Quaking Aspen
Serviceberry
Sandbar Willow
Elderberry
Pagoda Dogwood
Silky Dogwood
Grey Dogwood
Red-Twig Dogwood
Viburnum species
Witchhazel
Sumac species
Hazelnut

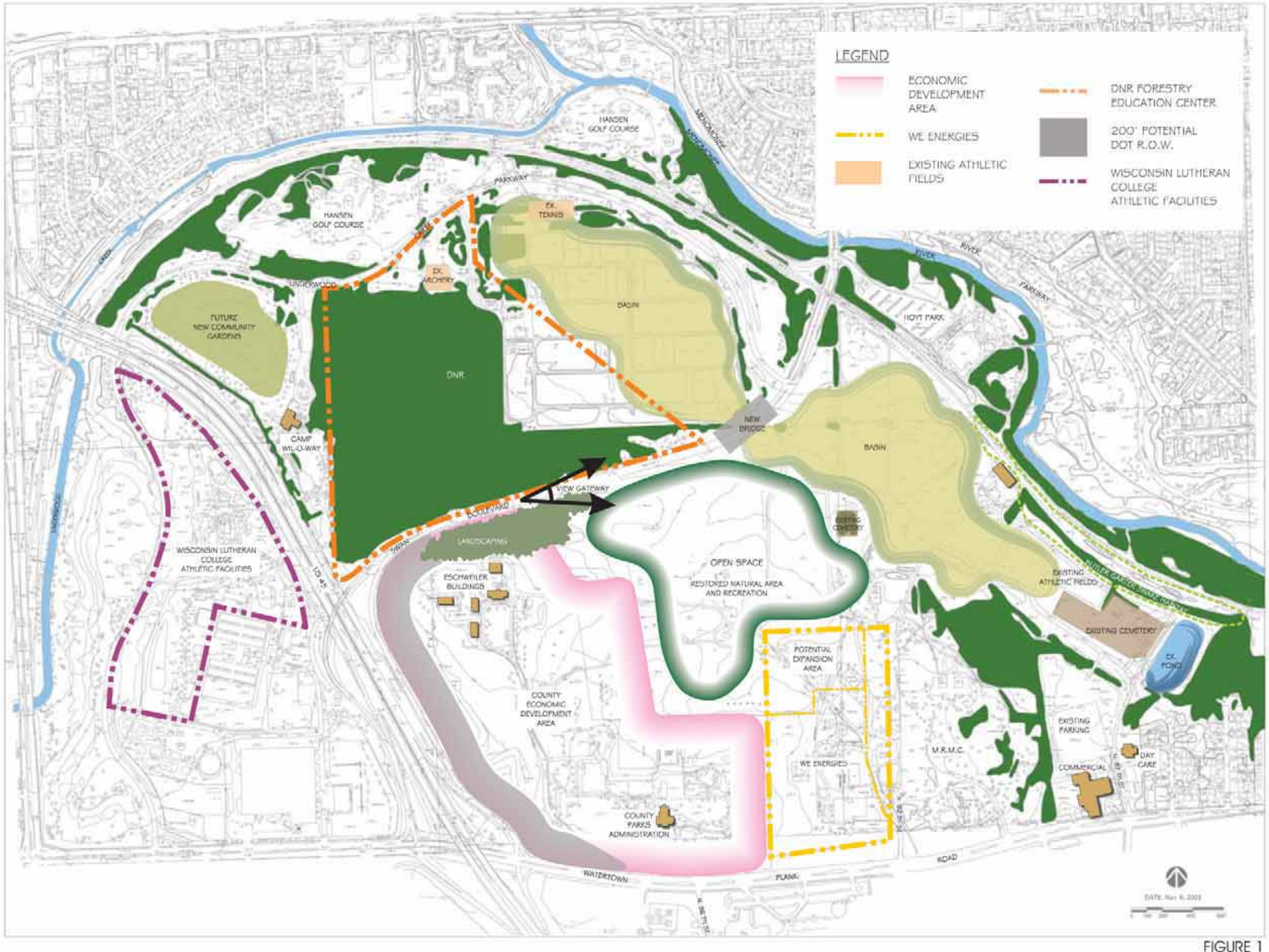

FIGURE 1

DESIGNATED LAND USE

Date: January 13, 2005

FIGURE 2

PLANNING PRINCIPLES

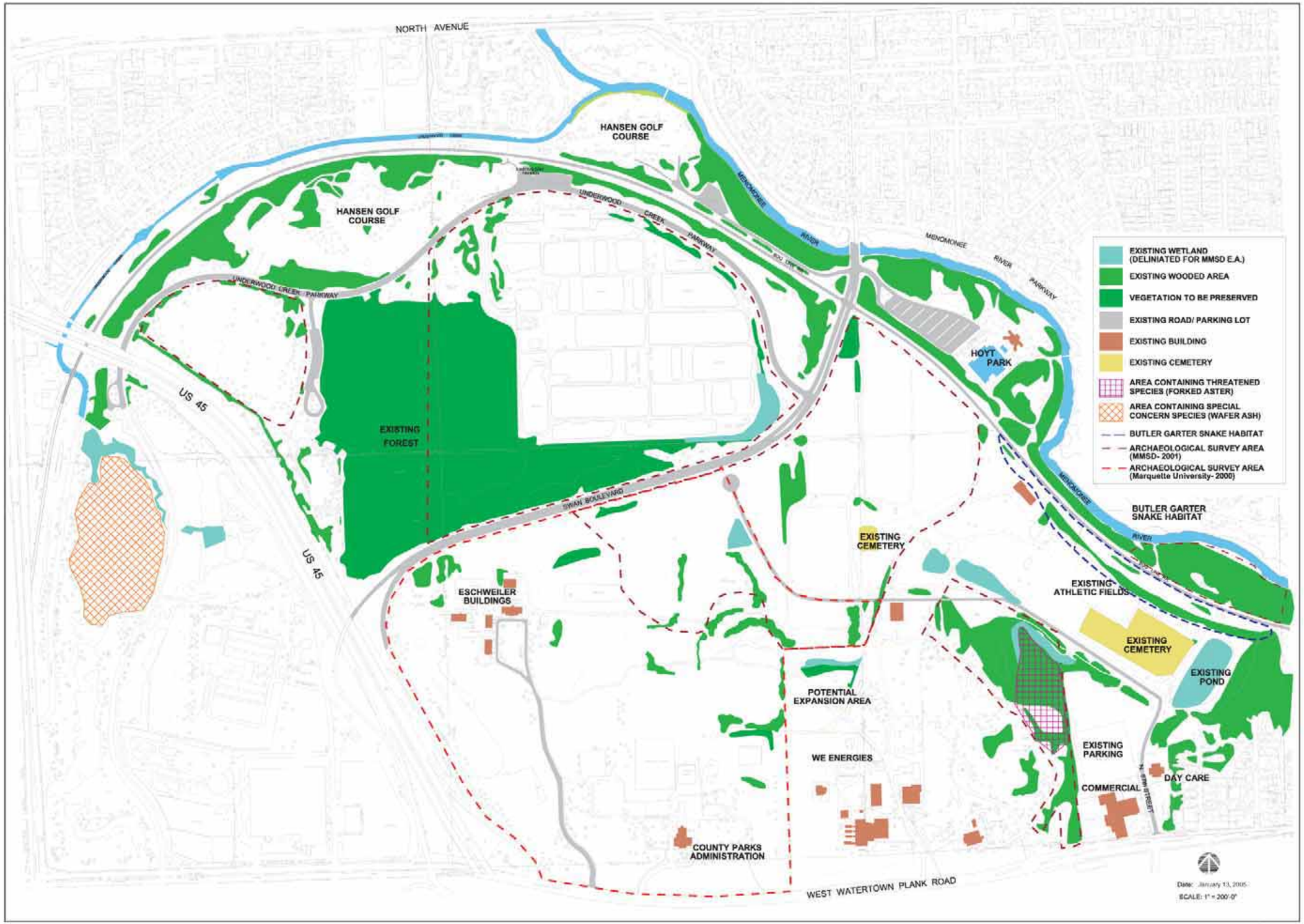

FIGURE 3

MILWAUKEE COUNTY GROUNDS

Existing Conditions

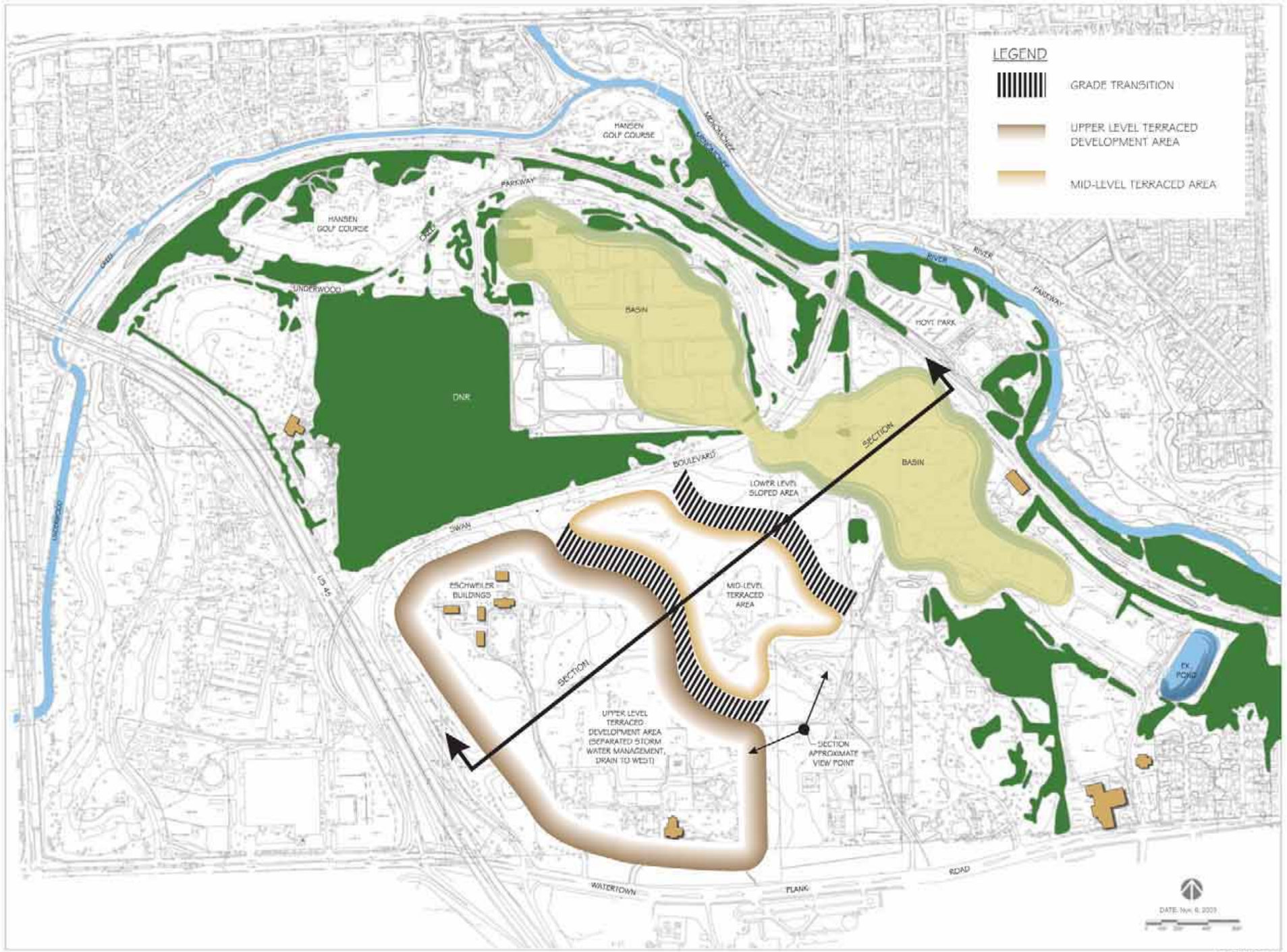

FIGURE 4

GRADING CONCEPT

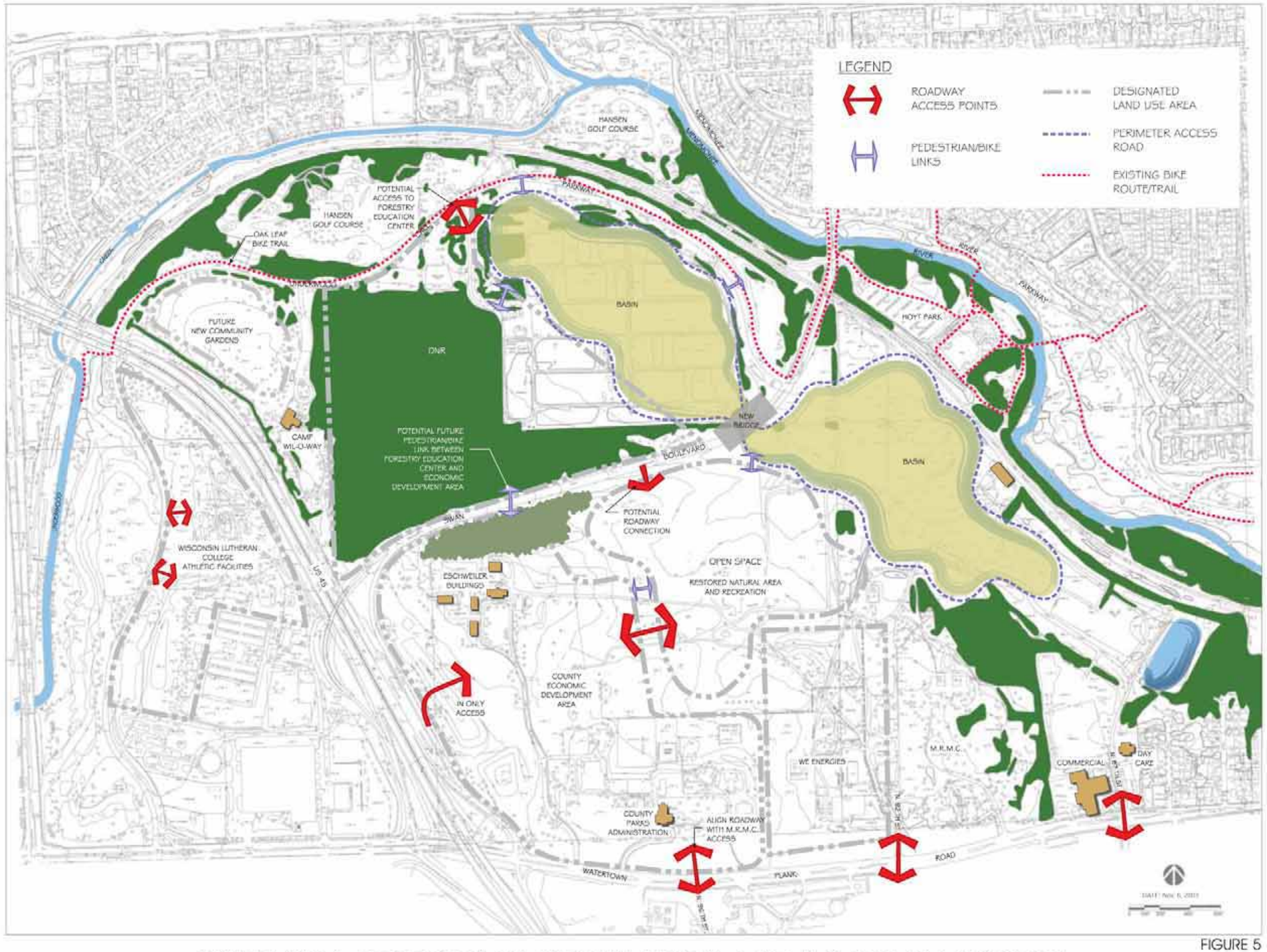

FIGURE 5

POTENTIAL PEDESTRIAN CIRCULATION AND ROADWAY ACCESS

FIGURE 6

ECOLOGICAL RESTORATION PLAN