The Cole Field Landfill:
Revitalized Riverside Community or Hopeless Wasteland?

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Environmental Studies 102
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May 12, 1989

Introduction

North of Cole Field on the Williams College campus in Williamstown, Massachusetts lies the Cole Field Landfill. The landfill was used by the town and the College from 1960 to 1973.[1] Due to a lack of governmental and state regulations, no record exists of what was dumped there. Since the closing, the parts of the landfill have been covered with either clay, sand gravel, or (in some places) nothing.[2] Plants have began to grow again and, except for garbage still present, the landfill shows little obvious evidence of its past.

Up until now, no detailed vegetation map of the Cole Field Landfill has existed. This paper provides such a map. One might expect the landfill to be home to many plant species characteristic of a floodplain region since it lies adjacent to the Hoosic River. This map may determine if the landfill's past use has permanently altered the region to the point of making it incapable of supporting the plant life that is once had.

Materials and Methods

The Cole Field Landfill covers thirteen and a half acres.[3] To map it takes careful methodology, a good sense of direction, and a great deal of endurance. Some preliminary steps must be made before the vegetation map is attempted so that the in the course of mapping one does not get lost or not realize where on the map one is. Some landmarks are necessary so that one can know where in the landfill one is. Landmarks are the key.

The first map available is one showing the boundaries of the landfill, the Hoosic River, clearings, contour lines, and monitoring wells (Appendix A). However, more landmarks are necessary. Fortunately, the landfill has supplied such landmarks in the form of old refrigerators, stoves, car parts, cement blocks, pieces of fencing,

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[1] In 1970 the use of the main landfill stopped and the landfill extension was started. Alliance Technologies Corporation, Williamstown Landfill Study, Volume 1 (1987), §4.1.

[2] Alliance Technologies Corporation, §4.5.

[3] The main part covers ten acres and the extension covers three and a half. Alliance Technologies Corporation, §4.2.

and much, much more. By using the given landmarks, a more detailed map with more landmarks can be made. This will be useful in later plotting the vegetation.

To make this more detailed map with more landmarks, one must traverse the landfill from south to north many different times. Starting from the eastern end of the landfill, using the first map (Appendix A), the landfill may be crossed and garbage noted. Upon reaching the north or south sides of the landfill, landmarks (like bends in the river or parts of the playing fields) may be observed to confirm that one is where he thinks he is on the map. In the center of the main part of the landfill, there is a lot of land to cover between north and south edges. However, there is are large clearings for landmarks and some monitoring wells. This method can be repeated for the western landfill extension which, conveniently, also has a large clearing and monitoring wells.

When the more accurate map of the landfill has been made with more landmarks, the landfill may be traversed again in the same manner. This time, however, instead of plotting garbage, different species of plants will be plotted. To determine the taxonomy of a plant, the "Quick and Dirty Key" supplied during a previous lab for the same purpose may be used.[1] In using the Key, one matches up the plant's characteristics with the characteristics of plants in the Key. And since the Key is specific to plants in or near floodplains, the plants match up often.

Mapping every individual plant in the landfill would be impressive, but not at all practical. In any given part of the landfill, there are different types of cover, many of which overlap. An effective and accurate way of mapping the vegetation of the landfill is to map trends of vegetation in certain areas. For instance, in a clearing, species such as grasses, goldenrods, Elymus riparius, and some pastinaca would be present. Instead of plotting the exact location of each of these plants, a general "clearing types of plants" may be noted and later specified as their specific species. In

[1]The Key was from the two labs: Topography/Bathymmetry of Eph's Pond and Upland Ramble.

addition, looking around, one may note a high representation of honeysuckle, box elder and other maples. Sometimes, there may be trends of only box elders and that too may be noted. An effort to record the exact location and number of a given species is valiant but would be pointless. explain?

So, in mapping the vegetation of the landfill one may assign a letter to each new species as it is identified at the site and write the letter at the point on the map corresponding to a trend of such a species. Species that cannot be found on the Key can be brought back to consult taxonomy books (or in this case, biology professor Henry Art). (See Appendix B for maps filled with letters, one for each species.) After the map is filled with letters, the trends may be transposed onto a new map where a different pattern may be used to represent each trend of a species or a few species. This patterned map should be easier to understand because patterns are clearer than many different letters jumbled onto a map. why use "may" throughout use active voice!

Results

The first map of the Cole Field Landfill (Figure I) shows the boundaries of the landfill, location of monitoring wells, clearings, the road that runs to and through the landfill, and the Hoosic River. This can be used to find the location of garbage in the landfill (Figure II). Among the types of garbage found are: refrigerators, heaters, metal strips, car parts, fencing, other appliances, metal drums once filled with chemicals, paint cans, glass bottles, tires, concrete blocks, and a safe.[1] Once this map has been made, one may use it to make the vegetation map of the landfill (Figure III). ugh! nice figure

The vegetation map, as mentioned earlier, shows trends of vegetation and not specific individuals. So, in a clearing shown to have grass types of vegetation there might be a box elder tree or a honeysuckle shrub. In addition, the only kinds of large trees noted on the map are red and striped maples, box elders, pines, and a few willows and birches. Undoubtedly, more than these few species are

[1]Types of garbage and "alleged" drums of chemical waste confirmed by Alliance Technologies Corporation, §4.1, §4.2.

living down at the landfill. However, the vegetation was predominantly these kinds. Other kinds were either not visible yet (in early spring) or were very similar in characteristics to the kinds of trees that were noted.

Discussion

Upon examining the vegetation map, the areas of the map that are in clearings according to Figure I are covered with grasses, Elymus riparius, and goldenrods. These plants, along with other grasslike plants represented in less quantity, make up the vegetation for the clearings. The clearings in the landfill lie on higher elevations than the rest of the landfill according to the original map of the landfill with contours (Appendix A). Perhaps, these clearings were the site of the dumpings when the landfill was in use. Surrounding the clearings are woody tree-filled areas consisting of box elders, maples, and honeysuckles. This treed region surrounds the clearings in the eastern part of the landfill and in the western part as well (although the western part does not show it as much in Figure III because that part was not part of the landfill).

Towards the center of the landfill, the trees (maples, box elders, and willows) seem to be younger than the parts of the landfill closer to its boundaries. The landfill continues to give rise to new and more trees. The new trees are more common in the older eastern part of the landfill than in the more recently used western landfill extension. Perhaps, the clearings are slowly becoming inhabited by trees and the clearing of the western landfill extension is just still recovering from its previous use and will soon be inhabited by young trees as well. This is supported by the Alliance report on the landfill which states that the landfill was used first in the northeast corner and gradually the dumping moved southwest towards the extension.[1] The eastern parts have had more time to recover.

Of the species determined to live down at the landfill, many are characteristic of wetland or floodplain vegetation. Polygonum,

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[1]Alliance Technologies Corporation, §4.2.

sedges, goldenrods, Cornus amomum, Elymus riparius, and ferns are species found at the landfill that are characterized as wetland vegetation.[2] Willows, birches, maples, and elders are trees found at the landfill that are usually found by rivers and streams.[3] The floodplain types of vegetation seem to have no trouble growing in the landfill (and growing quite densely in some spots, I might add).

← ??? (box elder vs a maple)

Conclusion

The landfill has proven able to support vegetation characteristic to its location in the floodplain. Once the site of daily dumping, the landfill has in some parts and is in the process in other parts of recovering. The edges of the landfill again are the home to large trees. The center of the landfill and the western landfill extension will soon have trees as tall as the ones on the edges of the landfill. The history of dumping on the landfill has had its effect on the vegetation. But the landfill has seemed to have recovered. The only remaining problem of the landfill is the large quantity of garbage that still sits there. Hopefully, this garbage may be removed so that the Cole Field Landfill could return to the riverside vegetable community that it once was.

Judd - Your figures are wonderful (are they accurate?) but your discussion was a little thin. I would have liked to hear more about tree ages and about specific requirements shown by different species. What are your recommendations about vegetation? Should nature be allowed to take its course. Should the surface trash only be removed, or should some be dug up? And do you have a recommendation for bank protection?

DPD

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[2]Dennis W. Magee, Freshwater Wetlands, (The University of Massachusetts Press, Amherst), 1981.

[3]William A. Niering, Wetlands, (Knopf, New York), 1985.

Figure I:
Cole Field Landfill

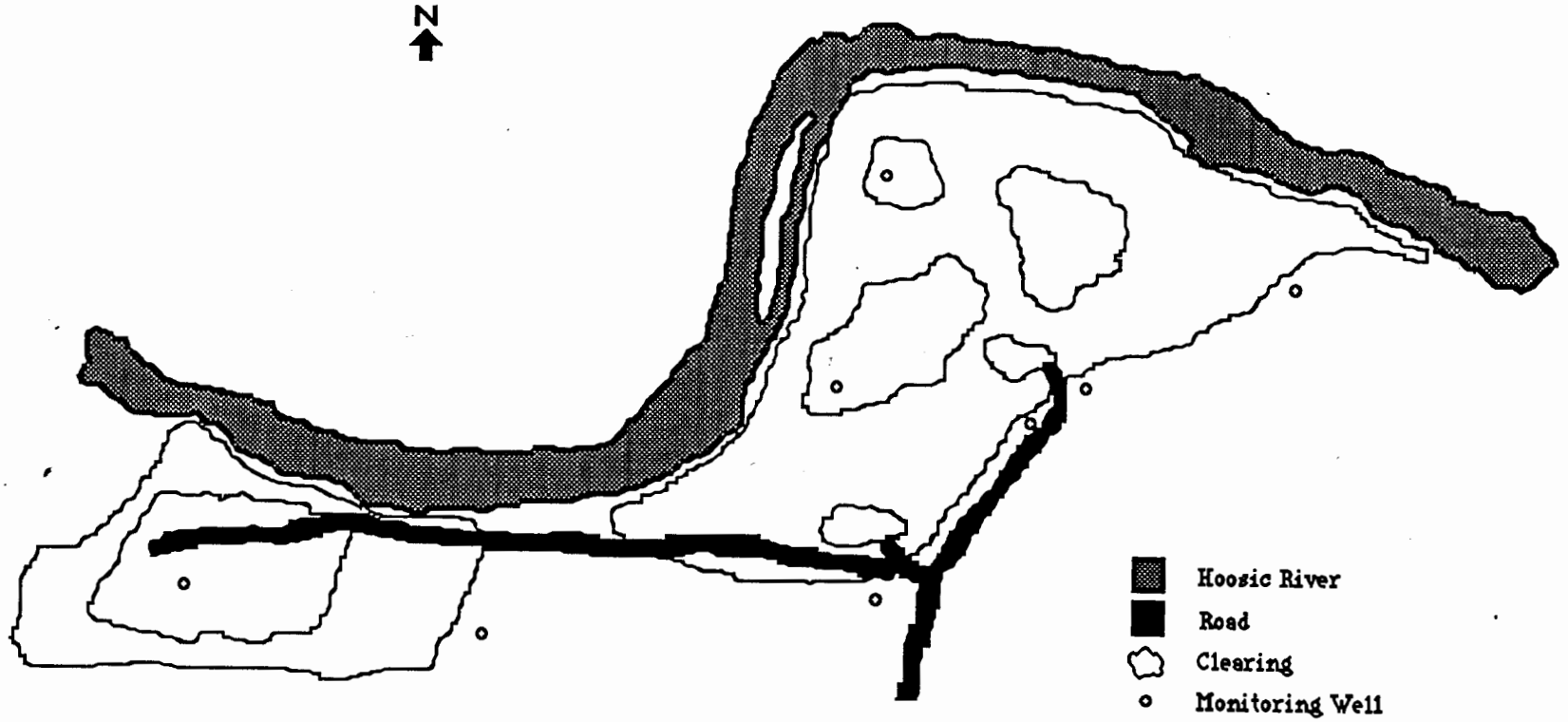


Figure II:

Cole Field Visible Garbage

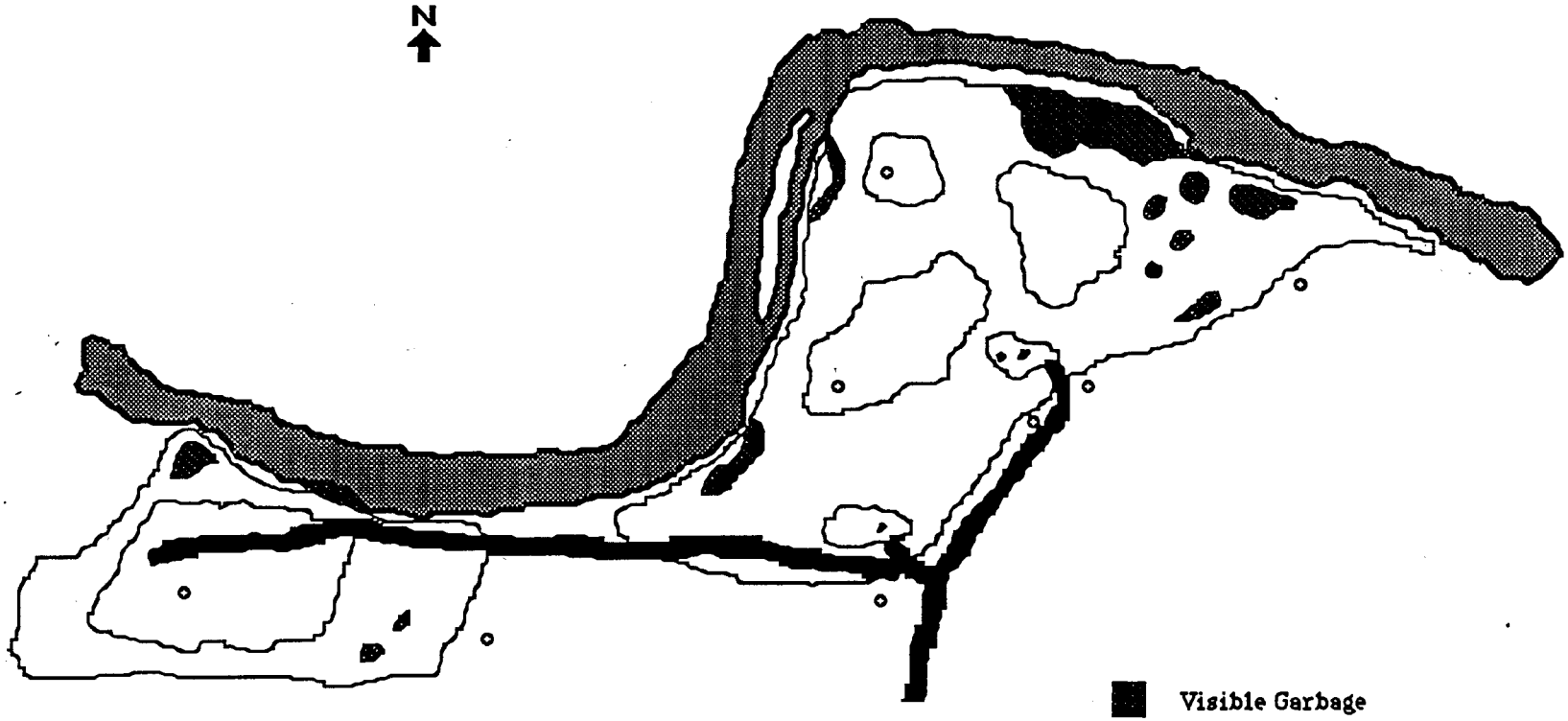
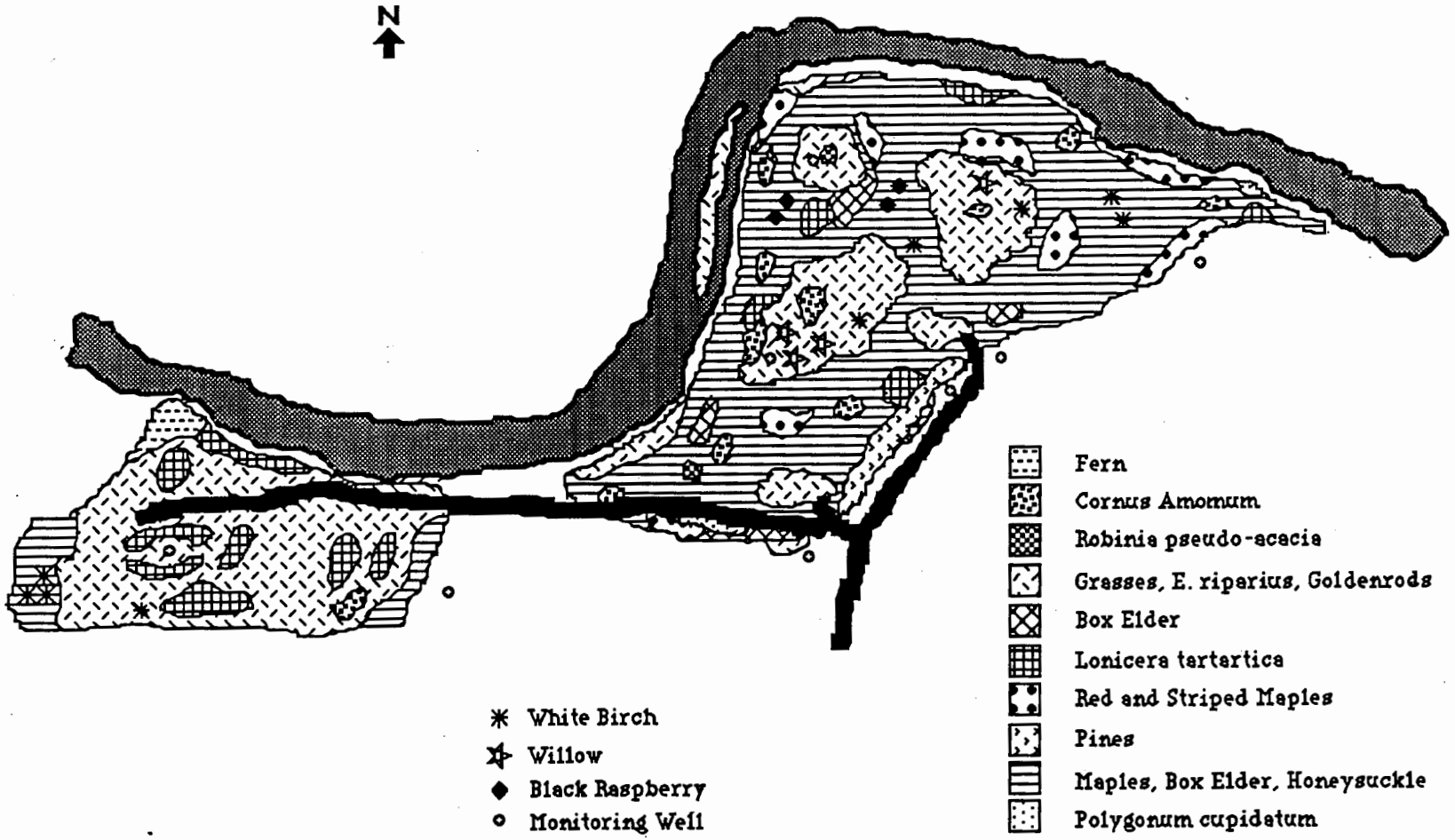
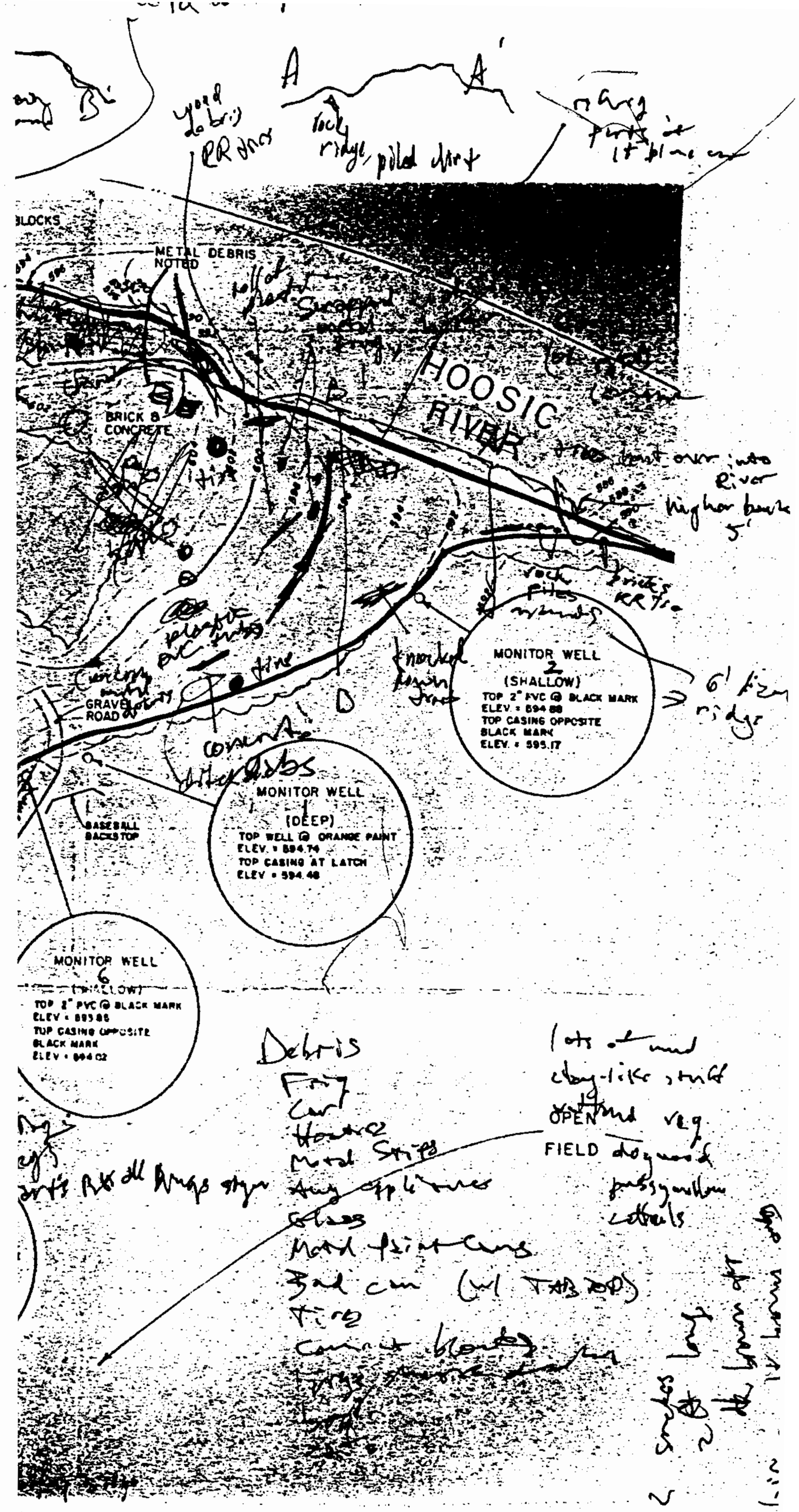


Figure III:

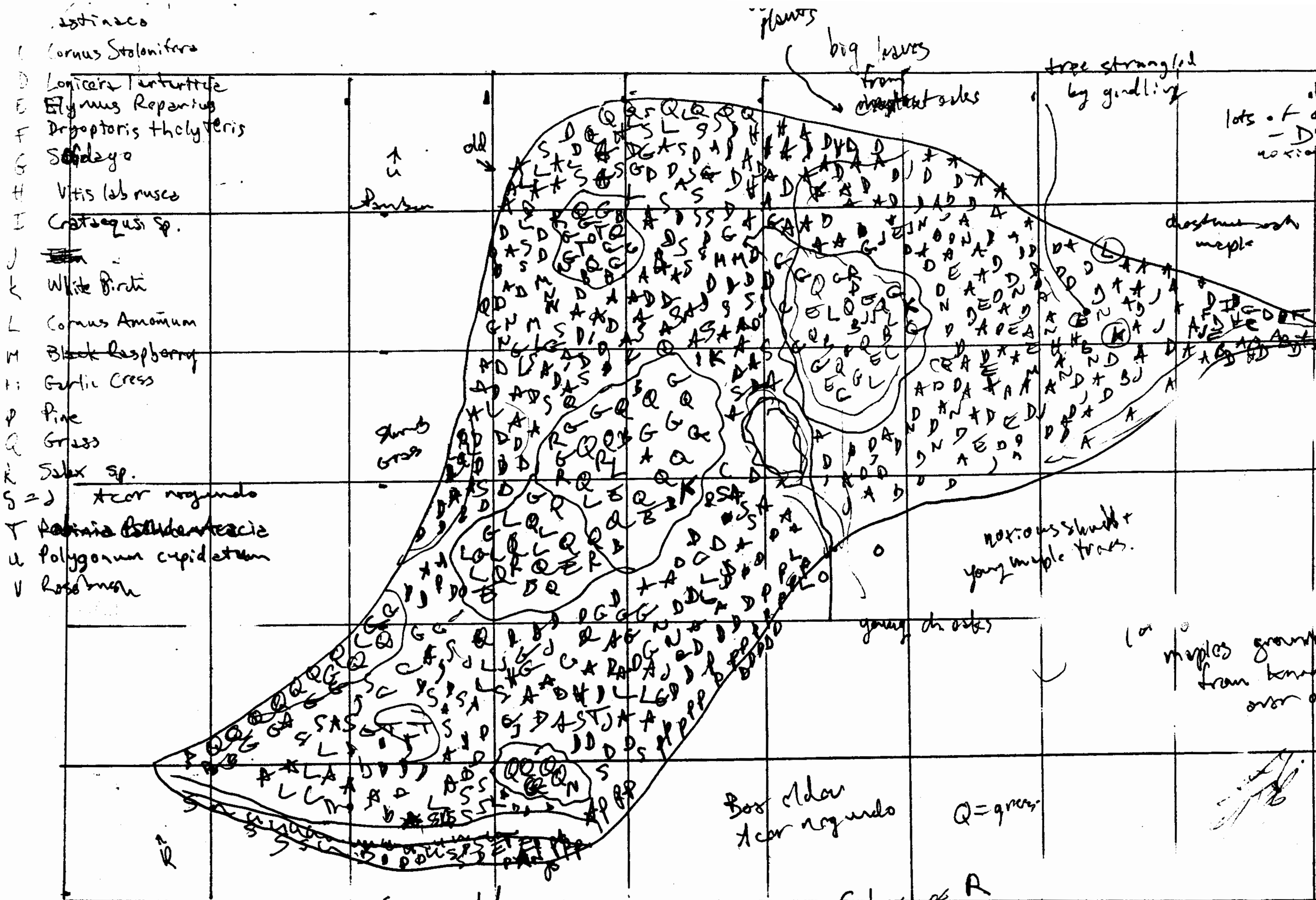
Cole Field Landfill Vegetation




A
A'
BLOCKS
METAL DEBRIS NOTED
BRICK & CONCRETE
HOOSIC RIVER
GRAVEL ROAD
BASEBALL BACKSTOP
MONITOR WELL 2 (SHALLOW) TOP 2" PVC @ BLACK MARK ELEV. = 594.88 TOP CASING OPPOSITE BLACK MARK ELEV. = 595.17
MONITOR WELL (DEEP) TOP WELL @ ORANGE PAINT ELEV. = 594.74 TOP CASING AT LATCH ELEV. = 594.48
MONITOR WELL 6 (SHALLOW) TOP 2" PVC @ BLACK MARK ELEV. = 593.85 TOP CASING OPPOSITE BLACK MARK ELEV. = 594.02
OPEN FIELD
wood debris
rock ridge, piled dirt
higher bank 5'
6' high ridge
Debris
Metal Strips
Glass
Tires
lots of mud
clay-like stuff

APPENDIX D1.

STERN LA FILL



Jane Greenwald
Bio 302

Garlic Cress

Salix or R willow yellow

Black Raspberry - M & purple

A=S or S=J

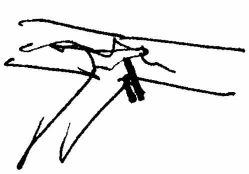
J - Elm

4 5

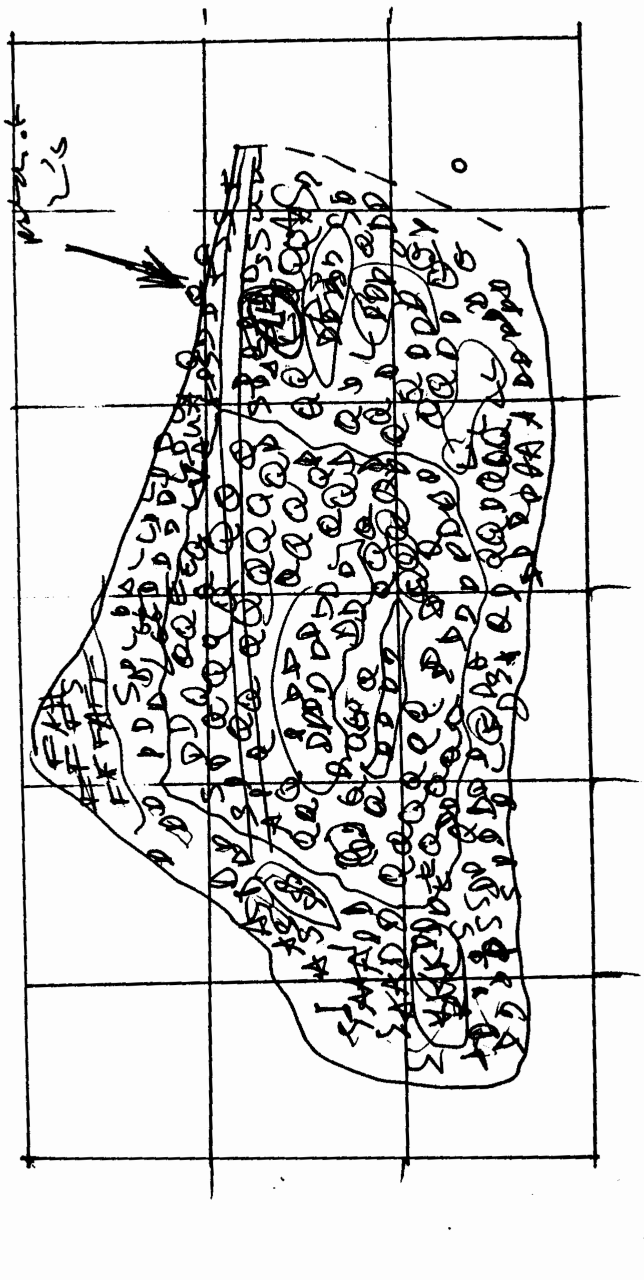
APPENDIX B2:
LANDFILL EXTENSION

+ — two thorns under each bud

Robinia pseudo-acacia Black Locust



Acer neg.



Mor to Polygonum cuspidatum Mexican bamboo