Emerald Ash Borer Management Program
For the City of Hibbing, Minnesota

This Emerald Ash Borer Management Program for the City of Hibbing was developed by the Engineering Department, January 2012

PURPOSE
By implementing the provisions in this management program, the City is attempting to minimize the disruption to its urban forest caused by the infestation of the Emerald Ash Borer (EAB). Taking a proactive approach to this infestation enables the City to address public and private needs in an efficient and effective manner.

The City will attempt to distribute costs associated with certain and massive tree death, based on the history of EAB elsewhere in North America, over a manageable time period, and lessen the social and economic impact that an extensive loss would have on the quality of life in our community.

APPLICABILITY
This program is applicable to all public properties where ash trees are currently growing in the City, on private properties where such trees may negatively impact public right-of-ways, on other private properties or where diseased trees generally threaten the health of the urban forest overall.

ADMINISTRATION
The City Tree Inspector will be responsible for implementing this program and seeing that program provisions are carried out.

EAB BACKGROUND
The Emerald Ash Borer (EAB) is an exotic beetle that was first discovered in Michigan in July 2002, probably having arrived on solid wood packing material shipped from its native Asia. Without any natural predators or controls in North America, it has spread into nearby states, Canada, and now into Minnesota, having killed millions of ash trees along the way.

Unfortunately, wherever it has been discovered, there has been no stopping its devastation, though millions of dollars have been spent on a variety of prevention methods. The economic impact on states, municipalities, property owners, nursery operators, and forest industries has been overwhelming. Minnesota's estimated 930 million ash trees could be decimated in Saint Paul, the metro area and the entire state.

The Emerald Ash Borer is a bright green, metallic beetle with an elongated, slender body measuring 7.5 to 13.5 mm long. The adult beetles leave a D-shaped exit hole in the bark when they emerge in spring. The adult beetles nibble on ash foliage but cause little damage. The larvae (the immature stage)

feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. This causes severe dieback in the canopy spreading downward and killing an ash tree. Other visible symptoms may include abundant wood pecker damage, epicormic sprouting from the base of the tree and splitting bark displaying serpentine larval galleries underneath. Unfortunately, all species, sizes and conditions of ash trees native to Minnesota are susceptible to EAB.

INCIDENT RESPONSE SYSTEM (ICS)

The introduction of Emerald Ash Borer in Minnesota is a significant event that requires the communication and coordination effort of many agencies. Thus, an Incident Command System (ICS) has been created, and is led by a unified command of the USDA and the MDA.

In addition, Hibbing communicates, cooperates and coordinates activities as needed with multiple other agencies such as the Minnesota Department of Natural Resources and neighboring Range cities. Likewise, the Department of Parks and Recreation will work closely with other internal city departments, outside agencies, neighborhood groups and residents to communicate and coordinate response efforts.

EDUCATION and OUTREACH

Ongoing communication, resident education and outreach have been key components of the initial response and those efforts will continue and be expanded upon as more information becomes available. Continued coordinated public information dissemination to residents and the media from both the state and local level ensure key information reaches the public as quickly as possible. Key updates have been and will continue to be transmitted via the City and MDA website

Moving forward, coordinated public information updates between the MDA and the City to the public will be a priority. The City is in the process of producing a video public service announcement that will be available via DVD, on the City's website, and broadcast on the City's cable television station. The public service announcement will aid in the "What can I do?" questions and will be updated as any new key information, such as grant opportunities for re-planting, becomes available.

Additionally, the City will work with the MDA to reach and educate commercial tree services in best management practices, as they play a key role especially in controlling the spread of infestation. Other private sector businesses and entrepreneurs will be sought and engaged to discuss and develop creative alternative utilizations of ash wood. This is a potential opportunity for new wood products and a possible catalyst for job creation.

As EAB activity occurs in neighborhoods, door-to-door contact using fliers will advise residents of specific activity for their boulevard tees and activity on their block.

ORDINANCES and POLICIES

The City has ordinances and policies that affect and outline what actions can and can not be done. These need to be reviewed and updated with EAB in mind:

- Update ordinances related to diseased trees to include EAB, such as the ability to enter private property for inspection, the ability to order removal of diseased trees, and the ability to abate the nuisance upon non-compliance of property owner:

    - *Action: Work with City Attorney to review and update Section 10.40 of the City Ordinances to include EAB in conjunction with Minn. Stat. § 18G. Any revisions will need legislative approval by the City Council.*

- Update/develop a city operating policy on removing ash prior to their EAB infestation. Any such policy adoption is dependent on approved budget authority:

    - *Recommended Action: The city will adopt a proactive "Structured Removal Plan" of ash trees, including those in decline and otherwise, that meets a set percentage of ash in anticipation of the larger loss of the entire ash population (minus any ash chosen for possible chemical treatment). The intent is to hopefully slow the spread of EAB by reducing host trees, thus, spreading out management costs over several years by avoiding a "spike" in diseased and dangerous trees. (Note: this is the plan commonly used in Ohio)*

    - *Recommended Action: The city will remove all ash with greater than 30% decline in areas scheduled for upcoming tree planting; and remove all ash with greater than 30% decline in other areas when requested by citizen(s); and remove selected ash with less than 30% decline as part of structured removal goals to manage EAB. This policy is designed to hopefully slow the spread of EAB by reducing host trees, and by accelerating the inevitable removal of ash, will help spread out the program schedule and associated costs.*

    - *Rejected Alternative: The city will adopt a "Wait and See Program" that removes only dead or dangerous ash or ash with greater than 30% decline at the request of a citizen. (Leaving declining ash provides more hosts for EAB, enabling it to possibly spread faster. It also only delays the inevitable to an even larger program and financial liability of removing increasingly dying and dangerous trees in future years)*

- Develop a policy for residents who wish to save a public tree through chemical treatment with EAB pesticides:

    - *Recommended Action: The city will permit residents to chemically treat a public ash tree under the conditions of hiring a competent tree service that is bonded and insured, is a State of Minnesota Licensed Commercial Pesticide Applicator using state approved trunk injection pesticides only. Limiting to trunk injections hopefully reduces pesticide exposure to others and the environment overall. (Note: Chemical treatment would not preclude future removal of said ash tree if deemed necessary.)*

        Cost: Indirect ($50/per for staff labor and vehicle to check site and issue)

    - *Rejected Alternate: The city will permit residents to chemically treat a public ash tree using any advertized EAB pesticide. (Doing so provides no control for possible environmental impacts due to using EAB pesticides in any manner of ways.)*

Cost: Indirect ($50/per for staff labor and vehicle to check site and issue permit)

- *Rejected Alternative: The city will prohibit residents from chemically treating a public tree.*

  Cost: $0.00

- *Rejected Alternate: The city will explore a program where it will chemically treat a boulevard ash tree near a residence if the resident pays the city the full cost to do so. Certain tree conditions would need to be met, such as location, age, size and health. It also would not preclude future removal of said ash tree if deemed necessary. Such an arrangement may be cheaper than paying a for-profit vendor and possibly would allow for more trees to be treated. (This policy only makes sense if the city is already mobilized to treat other selected specimen trees.)*

- Review and alter policy, if needed, for guiding the Street Tree Master Plan:

  [Note: The following alternatives for re-forestation will be reviewed and discussed by the citizen Tree Advisory Panel and Park and Recreation Commission with their recommendation expected by September 2009. This review will allow for the opportunity for public input]

  - *Action/Option 1: The city will alter the policy for tree planting by adopting a policy of complete diversity for any new planting on public boulevards—parks and parkways may be exempted for design aesthetic reasons. In other words, new boulevard planting areas will be made up of multiple tree species (though of similar stature and physical dimensions as determined by site conditions) to limit the risk of losing complete blocks or blocks of single specie trees in times of a fatal disease affecting a particular species.*

  - *Action/Option 2: The city will alter the policy for tree planting by limiting planting of monocultures of a tree species to a single block before changing. Doing so retains some consistency in design and character unique to the type of trees planted, e.g., all the same shape, size and color, while reducing the risk of losing multiple blocks in a row of trees within a neighborhood in the event of a fatal disease affecting the particular species.*

MONITORING

Monitoring the infestation is the first step to managing it. Though no additional resources have been added thus far to do so, the City of Hibbing will respond to calls for inspections from residents as well. Residents are directed to call the MDA *Arrest the Pest Hotline* for private tree inspections and/or the City of Hibbing Engineering Department for public trees, though Forestry responds to both.

PESTICIDE CONTROL

Pesticides known to control EAB, at least in the short term, are available. They may be a good alternative for individual trees such as in the case of a home owner with one special tree. However, using pesticide treatments on a large scale basis is evaluated as cost prohibitive considering they need

to be re-applied annually or bi-annually for the life of the tree. Also, scientific research is inconclusive as to the long term survivability from using pesticides, and negative environmental impacts of introducing EAB pesticides on a large scale are unknown.

There is information available, for example, that cites the possible negative non-target effect of pesticides such as Imidacloprid, the key active ingredient in many widely used pesticides for EAB. (See Addendum "A" for more information). Even so, there will be pressure to "save" existing ash trees. While the immediate cost of chemically treating is cheaper than removal and re-planting, it is delaying what has been inevitable tree loss in other communities.. As funding is secured for managing EAB, the decision on how best to invest public dollars evaluates removal and reforestation for the future, or a program of attempting to save existing ash trees without any guarantee of success? This management plan directs available resources to reforestation, planting new trees, and diversification of the City's tree canopy.

- Regarding residents requesting information on applying pesticides to their own private property trees:

    - *Action: City Engineer staff will provide residents available information on EAB pesticides when requested but will remain neutral on whether or not to use.*
      Cost: Indirect

- Regarding residents who request a permit to chemically treat the public boulevard tree near their residence:

    - *Action: City staff will inform residents of the city policy requiring an annual permit to chemically treat any public ash tree. Staff will then check the tree to see if it is worth pursuing. There is no cost to the citizen for the permit but it will require the hire of a licensed tree service that is bonded and insured, is a State of Minnesota Licensed Commercial Pesticide Applicator using state approved trunk injection pesticides only. Limiting to trunk injections hopefully reduces pesticide exposure to others and the environment overall. (Note: Chemical treatment would not preclude future removal of said ash tree if deemed necessary.)*
      Cost: Indirect ($50/per for staff labor and vehicle to check site and issue permit paperwork)

- Regarding the chemical treatment of public boulevard trees by the City:

    - *Recommended Action: The city will forego applications of EAB pesticides on ash trees and rather invest all available resources in removal and re-forestation for the future. This action allows more funds for new trees and avoids any possible negative environmental impacts attributed to using pesticides on a wide scale basis:*
      Cost: $0.00 annually

REMOVALS

Ultimately, North American communities haven't successfully eradicated EAB once found (with one possible exception, a small town in Michigan still under study). EAB typically builds in population and eventually infests and kills all variety of ash trees. Symptoms are slow to appear and once EAB is found it is estimated that it has already been present 3-5 years. Unless a tree is chemically treated with EAB pesticides (see Pesticides above), infected ash trees typically succumb to the disease and are subsequently removed and disposed of (some natural area trees are left to die standing).

Some methods designed to hopefully slow the movement of EAB have prescribed the proactive removal of declining, or even healthy, ash trees that will most certainly become infested anyway. And by accelerating the removal of these trees and re-planting with a different species, the total financial obligation is spread out in a more manageable way over several years. More importantly, where EAB has gotten out of control because of no structured removal plan, ash increasingly die and become dangerous to people and property that are targets for falling limbs and trees.

- The below removal scenarios include total removal and disposal of public trees, along with stump grinding, an average total cost of approximately $700 per tree.
  (Note: Re-planting options and costs are discussed below under its own category.)

    - *Recommended Action: The city will adopt a **"3% Structured Removal Plan"** proactively removing 1**00 boulevard and park ash trees annually**, or about 3% of an estimated 3,500 ash trees citywide (natural areas may be girdled and left to die naturally). This would put the city on a 20 year replacement plan, which is expected to be sufficient for the immediate future but may <u>or may not be</u> sufficient in subsequent years. (If not, future years may require accelerated removals using even more resources.) Removal would begin as soon as possible of all confirmed EAB trees, those with significant decline, and those in areas scheduled for upcoming planting (assuming funds will be available for new trees). Such a plan would be supported by the existing City of Hibbing Public Works and Parks crews, as routine work load.*

    - For removal of nuisance diseased EAB tree(s) on private property:

        - *The city will follow the procedures of an updated Section 10.40 on Diseased Trees. In short, once a property owner is ordered to remove a diseased tree and fails to comply within 20 days, the city may abate the nuisance by having it removed and disposed of in the proper way. All associated costs for the abatement will be assessed against the property owner which can be appealed at a hearing with the City Council.*

            Cost: All associated costs will be recovered through assessment
            At this point, no program has been established to provide private property owners financial assistance for dealing with EAB

- *For removal of nuisance dangerous tree(s), such as a dying or dead EAB tree(s) on private property:*

    - *The city will follow the procedures of Section 10.40 on the Removal of Dangerous Trees. In short, once a property owner is ordered to remove a dangerous tree and fails*

to comply within 20 days, the city may abate the nuisance by having it removed and disposed of in the proper way. All associated costs for the abatement will be assessed against the property owner which can
be appealed at a hearing with the City Council.
Cost: All associated costs will be recovered through assessment
At this point, no program has been established to provide private property owners financial assistance for dealing with EAB

WOOD UTILIZATION and DISPOSAL

The probable loss of thousands of ash trees creates several challenges for the City in regards to public trees as well as residents and commercial tree services dealing with private property trees.

In the early stages of infestation, care to slow down the spread of EAB is paramount not only for Saint Paul, but to other communities and the state.

The most critical period for movement of confirmed EAB ash trees is the months of June and July. This is the period where adult beetles emerge from trees, begin feeding on foliage, move to even more trees, and lay their eggs. During this period, it is best to leave these trees standing and not chance the possible spread of EAB by transporting beetle infested wood to other areas. After this period, from about August to May each year, EAB trees can be removed and transported so long as they are promptly chipped to the required dimensions, less than 1”x1”x1” in any one dimension, effectively killing any EAB larvae. Other ash trees not found to be infested with EAB can basically be cut and transported at any time, though again, to be safe, they should be promptly processed remembering that while EAB may not be evident, it is difficult to detect at low densities and may be present.

Regarding disposal, Hibbing is fortunate to have an Environmental Facility (HPUC) that can process all public trees for energy incineration at no charge to the city.

While this wood is put to good use creating energy and saving on other fuels, other possible utilizations should be explored, especially if there is a market that could provide a revenue stream to help finance EAB management. One such possibility is to mill some of the larger tree trunks into cants that could be sold for further products, such as lumber or posts. As long as the bark layers are removed (where the larvae and beetles reside) and chipped, the heartwood is fine for utilization. Other states, such as Michigan, have been successful in creating partnerships with entrepreneurs who have developed products and a market for new products made out of ash wood. Such cases are win-win for everyone involved.

One troublesome issue is the potential of handling clean up from a wind storm damaging EAB confirmed trees during the active period of June and July. Again, in order to avoid further spread of the infestation, all storm damaged trees in a known confirmed area should be chipped within the area before transportation to HPUC. This includes, inevitably, the wood cleaned up by home owners or commercial tree services working in the area and looking for a disposal site.

Finally, if ever EAB infestation spreads city-wide, chipping of confirmed EAB trees in a particular area to prevent further spread may no longer be required. All ash trees could be removed and transported to HPUC where they can be processed.

In summary, the following issues and actions regarding wood utilization and disposal are:

- Public ash trees confirmed with EAB will be processed in a way to minimize further spread of the disease as long as areas of the city are still free of EAB:

    - *Recommended Action: The city will explore and secure emergency marshalling yards—suitable for on-site tub grinding--within areas of EAB confirmed trees that need to be removed in response to an emergency, such as clean up of a wind storm during the months when beetles are active. These yards would be to process all wood in the area, including public, and private from property owners and commercial tree services. The chipped material will then be transported to HPUC.*
      Cost: to be determined

    - *Recommended Action: The city will work with the State of Minnesota and others to explore other possible utilizations of ash wood, such as milling large trunks into cants that could bring revenue.*
      Cost: to be determined in concert with possible revenue

- Private ash tree disposal is normally handled either by residents disposing at the City Yard Waste Facility, or through commercial tree services:

    - *Recommended Action: The city will work in cooperation with St. Louis County to communicate to and educate residents on the availability of compost sites for ash disposal.*
      Cost: Indirect

REFORESTATION

The future expected loss of over 6,000 boulevard, park and open space ash trees will require a massive reforestation effort. The benefits trees provide is broadly understood and includes cleaning our air, cooling our atmosphere, saving energy through shade and wind breaks, and making our city safer and more pleasant. Re-planting lost trees may be the most important part of the management plan because it will keep Saint Paul the Most Livable City for future generations.

Presently, tree planting is accomplished using Capital Improvement Budget (CIB) and other smaller project funds to plant about 50 trees per year, most of them 1 inch DBH (diameter at breast height), in bareroot form. Ideally, a re-planting program should be designed for the replacement of every tree that is removed the previous year. Thus, if Hibbing annually loses an additional 100 or more ash trees to EAB on top of the normal loss of 2,000 other trees, it will need to increase its planting accordingly. One strategy to increase the number of new trees planted is to choose additional 1 ½ to 1 ¾ inch, containerized stock, with grant money as it becomes available.

The City plants trees in accordance with the Street Tree Master Plan. Thus, with the impending loss of thousands of trees, consideration should be given to whether these guidelines should be reviewed and

retained or altered. Planting monocultures of species per block will no longer be promoted as usual and/or customary practice. Using the same tree species in an area creates a distinct character based on the trees all having a similar shape, size and color. However, it also subjects the entire area to the possibility of being all wiped out in cases of a fatal disease that targets a specific tree species. This occurred with the loss of American elm trees and now has a chance to do so again in the case of ash trees. An alternative approach would consider more diversity of trees but while this may guard against a complete loss of trees in an area, it also removes the design aesthetics provided by a monoculture.

As a pro-active measure, the Engineer Department was well aware that with EAB moving from state to state, it was a matter of time before it ended up in Minnesota. Therefore, a decision was made about two years ago to discontinue planting ash trees and begin the process of more diversification. Diversification reduces the chance of losing such a large percentage of trees all at once from a fatal disease targeting a particular species.

Action: The city will jointly promote partnerships such as the Friends of Parks and Trails Annual Tree Sale where proceeds assist the city in planting trees in parks.

- *Action: Where feasible, Forestry will issue permits and work with residents willing to purchase and plant trees on the boulevard near their residence.*

- *Action: The city will explore other opportunities such as partnerships with non-profits like Tree Trust on possible tree planting projects in city parks.*

- *Action: The city will seek Federal and State funding as well as grant opportunities for re-planting.*
  Federal funding will be sought working through our local federal delegation
  State funding will be pursued, specifically funds from DNR, Minnesota Releaf.

- *Action: The city will explore the possibility of creative promotions where residents may be able to purchase a tree at discount pricing to plant in their yard or a local park.*

OTHER

An undertaking as large as the infestation of Emerald Ash Borer will bring about many issues that are hard to predict or articulate, but will need attention as they come more into focus:

- Personnel needs are frequently mentioned above but must not be overlooked. EAB will bring challenges not unlike Dutch elm disease when crews were three to four times the size of today's Forestry staff. If EAB advances as it has in other parts of North America, it will be a matter of a few short years before the city will be facing a crisis of large numbers of dead and dangerous trees that must be addressed, and staff will be required to rise to the challenge.

- Equipment and technology goes hand in hand with personnel. Fortunately, technology has advanced greatly in the last 40 years and should allow for more productivity, but it nevertheless comes with great initial expense purchasing or leasing.
- Facilities to house added personnel and equipment may seem like a minor problem but is very real. The current Forestry facility has little to no room to add an additional two dozen new employees and the required equipment as outlined above. Either the existing facility will need to be modified and expanded, or another site--or added satellite site--may need to be explored. Cost for such a facility is unknown at this juncture.

ADDENDUM “A”

Pesticide Fact Sheet

Imidacloprid

1-((6-chloro-3-pyridinyl)methyl)-N-nitro-2-imidazolidinimine

General

Imidacloprid is an insecticide which is the first insecticide of its chemical family, neonicotinoids, which are modelled after nicotine, to be registered for use. Common trade names include Merit™, Admire™, Gaucho™ and Advantage™.

How It Works

Imidacloprid fits into the receptors meant to receive acetylcholine, which carries nerve impulses from one nerve cell to another. By blocking these acetylcholine receptors an excess of acetylcholine accumulates causing paralysis and eventual death.

Acute Health Effects

Effects of exposure to imidacloprid include apathy, difficulty breathing, loss of the ability to move, staggering, trembling and spasms. Studies on rats indicate that the thyroid is particularly sensitive to exposure of imidacloprid causing thyroid lesions.[1]

Chronic Health Effects

There are no publicly available chronic studies of commercial imidacloprid products. This is of concern because the absence of proof by no means indicates the absence of harm. Long term studies should be completed on a pesticide before it comes onto the market and such studies if they exist, they should be publicly available.

We do however know that imidacloprid affects reproduction in a variety of ways. In pregnant rabbits, imidacloprid fed between the sixth and eighteenth days of pregnancy caused an increase in the number of miscarriages and an increase in the number of offspring with abnormal skeletons.[2] Imidacloprid exposed rats gave birth to smaller offspring.

Environmental Effects - Wildlife

Imidacloprid is toxic to birds and wildlife and mildly toxic to fish. Imidacloprid use has been linked to eggshell thinning in birds[3], reduced egg production and reduced hatching success at exposures of 234ppm in food.[4] It is highly toxic to certain species including the house sparrow[5], pigeon, canary and Japanese quail[6].

Environmental Effects – Beneficial Insects

Imidacloprid is an insecticide, so it is not surprising that it is toxic to many beneficial insects such as honey bees to which imidacloprid is highly toxic.[7] Imidacloprid is acutely toxic to earthworms with an LD50 of between 2 and four parts per million in soil.[8] While extremely low doses of 0.2ppm and

0.5ppm have been shown to cause deformed sperm[9] and DNA damage respectively.

Imidacloprid has shown to severely limit the mobility of lady beetles, [10] as well as other predatory insects such as marid bugs and lacewings.[11] After marigolds were treated with the imidacloprid insecticide Admire, to kill spider mites, spider mite damage increased because the insect natural enemies of the spider mites were killed off by the imidacloprid.[12]

The widespread use of imidacloprid has been linked to colony collapse disorder, a phenomenon described by beekeepers, researchers and government officials when entire hive populations seem to disappear, apparently dying out. France has put restrictions on the use of imidacloprid (GauchoT) since the 1990s over concerns for the bee population.

Canada hasn't restricted use of the product despite warnings that similar impacts on bees were being felt here.

Prince Edward Island beekeepers have reported serious losses of bees which they believe since 1995 is linked to residues from imidacloprid. Potatoes on the island have been treated with soil applications of Admire (imidacloprid) to prevent Colorado potato beetle. It is believed that the rotational clover and canola crops have sublethal residues of imidacloprid in the pollen and nectar which cause slow death of bees in the colony.

Environmental Effects – Water Contamination

Imidacloprid has a high potential of leaching into groundwater. Although its persistence varies from the shortest half life of 107 days to concentrations which didn't begin to decline until over a year after use,[13] there is little question about imidacloprid's tremendous ability to move through soil.[14] Compared with 11 other popular pesticides Imidacloprid moved more quickly through soil than any of the other pesticides tested.[15] The other 10 pesticides tested included diazinon, chlorpyrifos and diuron which are widespread water contaminants.[16] It is classified by the EPA in category I as having the highest leaching potential.

Inerts

Commerical imidacloprid, and many other pesticides have inert ingredients that do not undergo toxicity studies prior to the regulation of the product, and little information is available. However, additives that have been shown to be found in imidacloprid including: two proven carcinogens crystalline quartz silica and naphthalene.[17],[18]

Conclusions

Imidacloprid has been shown to cause acute health effects, including spasms, and thyroid lesions. No chronic toxicity tests have been made available to the public, but we do know that it has effects on mammalian reproduction. The reproductive health of birds is also affected with reduced egg production, and egg thinning. It affects a multitude of beneficial insects, as well as earthworms.