APPENDIX A
CITY INTEGRATED PEST MANAGEMENT POLICY

PLANT DISEASE MANAGEMENT

With few exceptions, plant diseases do not constitute a severe enough problem to require extensive control efforts. Leaf blights caused by anthracnose, powdery mildew and entomosporium leaf spot can occur on several of our city's tree and shrub species and can at times cause severe and repeated defoliation. These problems are weather dependent. That is, they spread during specific weather conditions. When weather conditions change, the disease subsides, and the problem resolves itself. While control can be achieved chemically, it would typically require many repeat applications during these specific weather conditions. Because of these factors a non-chemical approach is utilized with these diseases; no action thresholds set for parks with the exception being Luther Burbank Home & Gardens. (See Luther Burbank Home & Garden Pest Management Action Thresholds table below.)

ANIMAL PEST MANAGEMENT

Insects

Insect pest management involves controlling damaging insects and those causing nuisance problems. These pests can cause significant flower and foliar damage, physically weaken plants, spread disease, and provide opportunities for disease and other insects to invade plants. Although control can be achieved through a variety of methods, focus on plant health resolves most cases.

The typical insect pest problems found in the city involve only a few insect pests and a handful of plant species. Whether this is fully attributable to beneficial insect diversity or because the plants that remain are those that suffer fewer insect pest problems and/or can tolerate higher insect populations is not known.

Mechanically, pests and/or infested plant parts should be removed by hand when possible. Removal of "brood wood" is effective in controlling certain insect species. Periodic, high pressure water washes can be used when insect populations are low.

Culturally, maintenance of plant health is of foremost importance in insect pest control. Properly cared for plants are less stressed and therefore less susceptible to insect (and disease) attack. Along the same lines, plant materials should be selected with care, matching species to conditions present at the site.

Biologically, beneficial insects provide the single greatest effort in controlling plant pests. This has resulted in few insect pest outbreaks, many of which require no attention on our part. Maintenance of beneficial insects is the key to controlling pest problems. This is accomplished by encouraging additional beneficial insects' habitat.

Chemicals may be a directive of the City Council, County or State for public health or neighboring

economic crop loss reasons. Those pesticides that are reduced risk are to be considered first. The use of attractants in conjunction with traps can be used, though this approach is most effective in dealing with specific pests and best used when monitoring pest levels. No action thresholds are necessary, currently, for park lands except for Luther Burbank Home & Gardens. (See Luther Burbank Home & Garden Pest Management Action Thresholds table).

Bees
Bees are a beneficial insect of immeasurable value because of their pollination efforts. Bees in general are not viewed by the city as threatening though bee stings are painful and cause extreme allergic reactions in some people. Management activities are designed to eliminate plant materials that are attractive to bees.

Where possible, every effort should be made to preserve bee populations in physical activities and in the selection and use of pesticides. Occasionally situations arise when the removal of a hive by a beekeeper is necessary.

Wasps, hornets, yellowjackets
These groups of stinging insects are collectively known as wasps. Most of these species are beneficial in they are predatory on soft-bodied insects and are best known for their aggressive, unwanted behavior. Their stings are painful and can cause extreme allergic reactions. Yellowjackets may reach nuisance level in parks during the late summer and fall. The Marin/Sonoma Mosquito & Vector Control District is currently offering nest eradication for clearly identified yellowjacket ground nest.

Digger bees (digger wasps, sand wasps)
This is an interesting insect closely related to the wasp group. They are found in large colonies in most of the sand play areas in our parks. This beneficial insect looks and behaves like a yellow jacket and can be a cause for alarm. Though fully capable of stinging, this insect is not aggressive and is no cause for concern. Manage by regularly racking playground sand areas to disturb and discourage nesting activities.

Spiders
This county has many spider species found in a variety of habitats. The black widow spider is also beneficial though its bite is painful and can be fatal. Control of black widow spiders is rarely warranted and more often when single female is found, it is eliminated via mechanical means.

Gophers & Moles
While gopher and mole are quite different in appearance, diet, and behavior, both are burrowing rodents that damage the landscape. Gophers create the greatest landscape damage by digging subterranean tunnels. Gophers also gnaw and damage plastic water lines and lawn systems. Their tunnels can divert irrigation water and destroy layers of soil in athletic fields, such as the soccer fields at A Place to Play Park. Gopher mounds in park turf grass areas interfere with mowing equipment and are oftentimes enlarged by dogs creating larger holes. Collapsed tunnels are another tripping hazard in turf grass. Gophers can also undermine structural integrity of dam and levee surfaces by increasing infiltration into the dam face which increases chance of dam failures. Most of the city's dams fall under regulations by the California Department of Water Resources'

Division of Safety of Dams. It is imperative to reduce costly gopher damage by eradication prior to establishment within turf fields and dam surfaces. Refer to UC IPM Pocket Gopher for more information about life cycles and management tips.

Ground Squirrels

Ground squirrels injure many types of plants, harbor diseases harmful to humans, and their burrowing damages landscapes. Ground squirrels are common in this area and large colonies exist at Howarth Park. Their nest hole burrow can get quite large, having the potential to be a trip hazard and cause soil erosion issues. Abundant population can lead to unnatural, aggressive food stealing interaction with humans. Ground squirrels present a potential for catastrophic hazards if allowed to burrow in the Lake Ralphine dam at Howarth Park or the two dams at Fountaingrove Lake within Nagasawa Park. The State Division of Safety of Dams requires eradication of burrowing animals. Refer to UC IPM Ground Squirrels for more information about life cycles and management tips, http://ipm.ucanr.edu/QT/groundsquirrelcard.html.

LUTHER BURBANK HOME & GARDENS

The Luther Burbank Home & Gardens (Gardens) is a two-acre site in downtown Santa Rosa that was Burbank's residence and where he conducted a large part of his plant research. This site is a Registered National Historic Landmark and is visited by thousands of people from around the world annually.

The gardens offer a glimpse at the wide variety of plant materials with which Burbank worked. These are displayed in demonstration gardens throughout the site and include species he worked with and varieties representative of those he developed. Other garden displays include a drought tolerant garden, sensory garden with plants selected for touch and smell qualities, a garden designed to attract birds and a border garden that illustrates the plant materials used for landscaping in Burbank's day.

Because of the amount and variety of landscape materials found in the Gardens, insect pests and plant disease levels can reach elevated levels quite rapidly. Insect pests rarely reach levels needing chemical treatment because this wide plant diversity supports many beneficial insects. Plant diseases, however, can and do reach damaging levels quite rapidly. Fortunately, most of these diseases are host specific and do not spread between different plant species.

Many of the maintenance activities inside the Gardens are thankfully performed by a large contingent of knowledgeable volunteers whose various tasks include hand removal of pests and plant parts that infested or infected with insects or disease. Additionally, these volunteers can provide the visitor with valuable horticultural information including IPM.

ACTION THRESHOLDS CHARTS

VEGETATION MANAGEMENT
ACTION THRESHOLDS
GENERAL LANDSCAPED AND OFFICE BUILDING AREAS

LOCATION	ACTION THRESHOLD	ACTION
All areas of city responsibility.	Weeds covering 10% or less of the ground where not desired.	Mechanically remove. Use weed burner. Where possible, add mulch to a minimum depth of 4 inches. Consider the use of densely growing plant materials.
	Weeds cover more than 10% of the ground where not desired.	Any of the above non-chemical tactics. Spot treat with appropriate herbicide.
	Weeds cover 5% or less of the ground in planter beds.	Mechanically remove. Use weed burner. Where possible, add mulch to a minimum depth of 4 inches. Consider the use of densely growing plant materials.
	Weeds cover more than 5% of the ground in planter beds.	Any of the above non-chemical tactics. Spot treat with appropriate herbicide.
	Any area historically requiring weed control measures.	Spring and/or Fall application of pre-emergent herbicide.

VEGETATION MANAGEMENT
ACTION THRESHOLDS
TURF AREAS

LOCATION	ACTION THRESHOLD	ACTION
All turf areas.	Broadleaf or grassy weeds cover less than 20% of the turf area.	Observe proper mower sanitation. Remove mechanically. Re-evaluate cultural practices, test soil fertility.
	Broadleaf or grassy weeds cover 20% or more of the turf area.	Any of the above tactics. Spot treat with appropriate herbicide.
Turf edges that can be edged with power edger.	Any time edging is necessary.	Use power edger.
Turf edges that cannot be edged with power edger.	Turf growing up to 3 inches over pavement edge.	Remove mechanically. Use weed burner.
	Turf growing more than 3 inches over pavement edge.	Any of the above tactics. Spot treat with appropriate herbicide.
Turf irrigation heads	Turf growing around head causing water to pond or other disruption of proper operation.	Mechanically remove. Vertical mow to remove built-up thatch. Raise head in extreme case.

VEGETATION MANAGEMENT
ACTION THRESHOLDS
ATHLETIC FIELDS

LOCATION	ACTION THRESHOLD	ACTION
All areas of city responsibility.	Winter weed removal for pre-season preparation of baseball and softball fields.	Mechanically remove weed growth with field drags. Spot treat with appropriate herbicide.
	Turf encroached up to 12 inches into bare areas of ball diamonds.	Mechanically remove. Use weed burner.
	Turf encroached 12 inches or more into bare areas of ball diamonds.	Any of the above tactics. Spot treat with appropriate herbicide.
	30% of field lines have unwanted regrowth.	Mechanically remove. Spot treat with appropriate herbicide.

MISCELLANEOUS AREAS

LOCATION	ACTION THRESHOLD	ACTION
Asphalt or concrete roads, pathways, parking areas or other paving and hard surfaces.	Weeds growing in joints or cracks.	Mechanically remove. Use weed burner. Any of the above tactics. Spot treat with appropriate herbicide.
Surplus properties, roadsides, pathways, other R-O-W sites such as fire hydrants traffic signal control boxes.	Weeds & other unwanted vegetation cover less than 25% of the area.	Mechanically remove. If possible, add mulch to a minimum depth of 4 inches.
	Weeds & other unwanted vegetation cover 25% or more of the area.	Any of the above tactics. Treat with appropriate herbicide.

ACTION THRESHOLDS
TRAFFIC MEDIANS

LOCATION	ACTION THRESHOLD	ACTION
All traffic medians.	Weeds cover 5% or less of the surface of landscaped median.	Mechanically remove. Use weed burner. Add mulch to a minimum depth of 4 inches. Consider the use of densely growing plant materials.
	Weeds cover more than 5% of the surface of landscaped median.	Any of the above tactics. Treat with appropriate herbicide.
	Weeds cover 10% or less of the surface of non-landscaped median.	Mechanically remove. Use weed burner. Add mulch to a minimum depth of 4 inches. Consider the use of densely growing plant materials.
	Weeds cover more than 10% of the surface of non-landscaped median.	Any of the above tactics. Treat with appropriate herbicide
	Weeds in the concrete cracks/joints of any median cover less than 5% of the area or are less than 6 inches in height.	Mechanically remove. Use weed burner.
	Weeds in the concrete cracks/joints of any median cover 5% or more of the area or are 6 inches or more in height.	Any of the above tactics. Treat with appropriate herbicide.

VEGETATION MANAGEMENT
ACTION THRESHOLDS
POISON OAK - BLACKBERRIES - UNWANTED TREES/SHRUBS

LOCATION	ACTION THRESHOLD	ACTION
All areas of city responsibility.	Poison oak growing in any area with potential for contact.	Remove mechanically.
		Treat regrowth with appropriate herbicide.
	Blackberry thicket to be partially or fully removed.	Treat regrowth with appropriate herbicide.
	Blackberries growing in landscaped areas.	
	NOTE: When chemical treatment of blackberries is warranted, non-fruiting canes may be treated at any time. Any stands containing fruiting canes can only be treated after all fruit has dried.	
	Unwanted weed species; tree or shrub.	Remove mechanically.
		Remove stump.
		Treat stump and regrowth with appropriate herbicide.

AQUATIC WEEDS

LOCATION	ACTION THRESHOLD	ACTION
Boat launches, dams, spillways and around fish pier at Howarth Park/Lake Ralphine, Nagasawa Park/Fountaingrove Lake and Francis Nielsen Ranch Park/ Nielsen Pond, Meadowlane Ponds, Delta Pond, Brown Farm Pond, Alpha Farm Ponds, and Ambrosini Pond.	Eurasian water milfoil growing to within 18 inches of water surface.	Treat with appropriate herbicide per Fish & Wildlife and/or Water Board permit. Explore viable biological and mechanical control methods.
	Less than 1% coverage Cattails, bulrush, and other tulles weeds growing on the dams, near spillways, boat ramps, areas creating mosquito habitat and areas where summer flows are restricted which may cause siltation increases chance of winter flooding.	Evaluate site for modifications, such as dredging. Mechanically remove when water levels are at their lowest in the late summer. Treat regrowth with appropriate herbicide in spring.
	Floating weeds such as mosquito fern (*Azolla* spp.), duckweeds (*Lemna* spp. & *Spirodela* spp.) and Watermeal, (*Wolffia* spp.) covering 5% of the water surface.	Mechanically remove by netting and hauling-off. Treat with appropriate herbicide allowable by permit.
	Blue algae and other algae species.	Aerate or increase water circulation. Biological treatment of beneficial bacteria. Physical application of aquatic black pond dye to reduce sunlight penetration.

GOPHER & MOLE PEST MANAGEMENT
ACTION THRESHOLDS

LOCATION	ACTION THRESHOLD	ACTION
All areas of city responsibility.	Evidence of mole is observed.	Physically remove mole. Trap; to be set only where it can be done safely.
	1 gopher mound in any turf area, annual planting bed, or dam structure OR 10 mounds in any 1,000 square feet of planted areas OR 20 mounds in any 1,000 square feet of non-planted areas.	Trap in turf non-layer athletic fields. Bait or fumigate in athletic fields and dam structures. Provide control of broadleaf weeds if in turf.

GROUND SQUIRREL PEST MANAGEMENT
ACTION THRESHOLDS

LOCATION	ACTION THRESHOLD	ACTION
All areas of city responsibility.	Any ground squirrel burrows entrance that is a hazard.	Fill in burrow entrance. Bait; stations to be safely set within burrow.
	Any ground squirrel burrowing within 50 feet of the base of dam at Lake Ralphine.	Bait; stations to be safely set within burrow.

LBH&G PEST MANAGEMENT
ACTION THRESHOLDS

LOCATION	ACTION THRESHOLD	ACTION
ROSES	RUST: susceptible varieties showing 15% of foliage infected with rust, OR Weather conditions favor development of disease; 55-75°F and wet foliage.	Provide proper soil moisture and fertility. Remove infected plant parts including those which have fallen. Remove infected canes when dormant pruning. Avoid overhead watering. Treat with fungicide. Apply fungicide with dormant spray. Replace with resistant varieties.
	BLACKSPOT: Susceptible varieties showing signs of infection on 10% of foliage, OR Weather conditions favor development of disease; 55-75°F and wet foliage.	Provide proper soil moisture and fertility. Remove infected plant parts including those which have fallen. Remove infected canes when dormant pruning. Avoid overhead watering. Treat with fungicide. Apply fungicide with dormant spray. Replace with resistant varieties.

LOCATION	ACTION THRESHOLD	ACTION
ROSES, ZINNIA, DAHLIA, CALENDULA, OTHER SUSCEPTIBLE BEDDING PLANTS.	POWDERY MILDEW: Susceptible varieties showing signs of infection on 10% of foliage.	Provide proper soil moisture and fertility. Remove infected plant parts + those which have fallen. Remove infected canes when dormant pruning. Prune to promote air circulation. Apply water in mid-afternoon (on roses: only to varieties resistant to Blackspot and Rust). Treat with fungicide + with dormant spray. Replace with resistant varieties.
ROSES	APHID: 15 aphids found on terminal 6 inches including flower bud.	Insure proper cultural needs, avoid high nitrogen levels. Water wash at any time. Remove infested parts. Control ants if possible. Treat with insecticide, + with oil in dormant spray.
STONE FRUITS	APHID: 10 aphids found on any 10-leaf sample, OR Distortion affects 15% of foliage.	
GLADIOLUS	THRIPS: 2% of foliage showing damage.	Insure cultural needs. Remove severely infested plants. Introduce beneficial insects. Treat with insecticide. Rotate beds in future years. Remove corms to dry.

LOCATION	ACTION THRESHOLD	ACTION
All landscape plants.	MITES: damage visible on 25% of foliage.	Address cultural needs. Address problems that promote population build-ups. Inspect for beneficial species. Treat with miticide.
	WHITEFLY: individuals of any growth stage present on 10% of foliage.	Address cultural needs. Inspect for beneficial species. Release parasitic wasps. Remove infested plant parts. Treat with insecticide.
	SCALE: visible on 15% of branches.	Address cultural needs. Inspect for beneficial species. Remove infested plant parts. Treat with insecticide. Use oil in with dormant spray.