



MEMORANDUM

DATE: November 4, 2015

TO: Citizens' Water Advisory Committee

FROM: Sandy Elder
Deputy Director, Tucson Water

SUBJECT: Aerial Application of Glyphosate on Tucson Water (TW) Property

In response to the recent listing of glyphosate by the International Agency for Research of Cancer (IARC) as a "Group 2A – probably carcinogenic," TW began receiving inquiries regarding the application of an herbicide known as glyphosate on its retired farm properties in Avra Valley. Subsequently, the Citizens' Water Advisory Committee (CWAC) has been addressed by members of the public multiple times on the use of glyphosate on TW property, specifically the aerial application of glyphosate. At the Committee's request, TW has prepared this response.

Background:

TW owns 22,000 acres of land in Avra Valley, purchased for their water rights in the 1960's, '70's and '80's. Of those lands, about 40-45% are currently covered in buffelgrass, a highly invasive, noxious weed that has negative impacts to its environment. These impacts are of regional concern, as buffelgrass occurs not only on Tucson Water's lands, but also on federal, state, reservation, and privately-held lands in the region.

In the 1980's, after the failure of various other control efforts, buffelgrass was planted to mitigate conditions of extreme erosion and dust control needs on several these properties. This mitigation method was used along the Brawley Wash corridor on City and non-City properties alike. It was unknown, at the time, the future damage the buffelgrass would inflict on the lands and the environment.

By regulation, property owners are required to control buffelgrass because it adds to the rangeland's fuel load, and also poses an extreme threat to habitat diversity. Pima County Code (Section 1, Title 7, Chapter 33) and State Statute (48-2997.E) require the timely abatement and eradication of noxious weeds, including buffelgrass, subject to penalties. Additionally, TW's Avra Valley lands are covered by a federally-administered Habitat Conservation Plan (HCP). The HCP is an agreement between the U.S. Fish and Wildlife Service and the City of Tucson that protects Tucson from liability under the Endangered Species Act. The Plan identified the threat buffelgrass poses to the natural habitat and species found in the area, evaluated the application of glyphosate as a best management practice, and is predicated upon the continued targeted control of buffelgrass by either hand pulling or aerial application of glyphosate.

TW uses aerial spraying of glyphosate to control buffelgrass on rangelands because it is most cost effective given the large number of acres. The Utility has, over the years, explored other means of managing this noxious weed including, physical removal of the weed, manual application of herbicide, mowing, disking, revegetation, burning and/or grazing. Each of these methods are generally impractical as sole or "primary" methods of buffelgrass control for large areas and are cost prohibitive when compared to aerial spraying. Hand-pulling is practical only when dealing with relatively limited areas where buffelgrass occurs and is not a viable approach for thousands of acres of rangeland. However, some of these methods are used to complement current practice as "secondary" measures where deemed appropriate. Whatever set of approaches is utilized over time, weed management must be applied consistently and in a timely manner on impacted lands in order to maintain long-term control of buffelgrass to reduce its fire-load potential and its threat to the environment.

The City of Tucson developed an aerial herbicide spraying program in discussion with the U.S. National Park Service, Forest Pesticide Coordinators (FPC), researchers at the University of Arizona, members of the Southern Arizona Buffelgrass Coordination Center, and TW's contracted land manager – BKW. The FPC is a branch of subject matter experts that analyzes, completes risk assessments, trains, and advises the U.S. Department of Agriculture/U.S. Forest Service on the use of pesticides within the National Forest System. The program is based on the risk assessment of glyphosate by the U.S. Environmental Protection Agency(EPA). It

is designed to target the noxious weed during its green up phase when it is most susceptible to treatment. The City conducted aerial herbicide spraying to manage buffelgrass in 2009, 2010, 2013, 2014, and 2015 on selected Avra/Altar Valley lands.

The City's program relies on the use of glyphosate because it quickly dries upon application and it degrades rapidly in the soil. The glyphosate that falls onto the ground during aerial spraying binds tightly with soil particles. The bound herbicide particles will not runoff into drainages even if precipitation occurs within hours of application. The concentrations of glyphosate are diluted to follow manufacturer's label ratings for aerial application to minimize potential impact on non-target vegetation. As an added precaution, the herbicide is only applied when there is no precipitation forecasted for at least seven days. Furthermore, whenever wind speed exceeds four miles per hour, aerial applications are terminated to minimize the potential for spray drift. When judiciously applied, the use of glyphosate is a common and often preferred choice in buffelgrass abatement.

The City takes great measures to ensure the safe use of glyphosate on its properties. There are several factors that affect drift of applied herbicide to non-target areas, mainly droplet size, wind speed, release height and weather conditions. When said conditions are controlled for, studies show substantial drift is contained to 75 feet. The City's licensed contractors mitigate drift by controlling for as many of these variables as possible. In addition, glyphosate is the only herbicide that is used by TW in its buffelgrass management efforts.

Glyphosate:

Glyphosate has been determined to be environmentally safe when applied according to guidelines approved by the manufacturer and the U.S. EPA. A primary reference commonly used to establish product safety parameters and guide application considerations is the body of research summarized in the report *Glyphosate-Human Health and Ecological Risk Assessment* that was prepared for the U.S. Department of Agriculture and the U.S. Forest Service. Use of any chemical herbicide can be controversial and glyphosate is no exception. Only through extensive research and evaluation of mainstream scientific reports was the decision made to use glyphosate. Studies can be found that bring into question the safety of glyphosate. These studies need to be carefully reviewed to ascertain their specific scope and purpose, to evaluate their scientific rigor, and to determine their actual applicability to real world exposure conditions.

The recent listing of glyphosate by the IARC as a "Group 2A – probably carcinogenic" is based on a different interpretation of the same research that was used to determine the current U.S. EPA classification of "D – Not classifiable as to human carcinogenicity." Being classified as Group 2A indicates that the evidence of carcinogenicity is not conclusive, and one should take care with use of the product to mitigate possible negative consequences. A new risk assessment from the U.S. EPA is expected this year. All new information and classification changes will be fully considered in the continued execution of the City's aerial herbicide spraying program to support its buffelgrass management efforts on rangelands.

The following video by Andrew Maynard, a toxicologist and Director of the University of Michigan's Risk Science Center, will help clarify what the IARC label of probably carcinogenic means: *What Does "Probably Causes Cancer" Actually Mean?* <https://www.youtube.com/watch?v=CbBkB81ySxQ>

Methods for Buffelgrass Control:

TW analyzed the following methods for the control of buffelgrass on all of its lands, with special consideration for "sensitive areas" (561 acres of land in near proximity to an occupied structure):

- **Aerial application of glyphosate (baseline)**
This is the current method, and forms the baseline for analysis. This method is supported by science, risk assessment measures, and cost effectiveness. It ensures compliance with regulations, as well as the HCP for these lands. The method can easily cover extensive acres within the treatment window.
- **Truck & boom spraying of glyphosate**
This method increases costs about 5 times more than the baseline approach. It will further minimize any drift of the herbicide. Truck & boom applications increase the amount of glyphosate being applied from the baseline approach. Access to all treatment areas may not accommodate the necessary equipment, and obtaining access to all areas in need of treatment may cause damage to the properties. It is unlikely that this method can cover the roughly 10,000 acres inside of the treatment window.
- **Hand spraying of glyphosate**

This method increases costs 10 times more than the baseline approach. It will further minimize any drift of the herbicide. Hand applications increase the amount of glyphosate being applied from the baseline approach. All treatment areas may not accommodate foot access. It is unlikely that this method can cover the roughly 10,000 acres inside of the treatment window.

- **Reseeding with native seed**

This method would be considered after mowing the buffelgrass, disking the land, and either aerial reseeding with culti-packing, or hand reseeding. This method increases costs about 24 times from baseline. There is a high risk of invigorating buffelgrass by disking the land and of native seeds failing to persist.

- **Reseeding with resilient crop**

This method would be considered after mowing the buffelgrass, disking the land, and either aerial reseeding with culti-packing, or mechanical reseeding. This method increases costs about 12 times more than the baseline approach. There is a high risk of invigorating buffelgrass by disking the land and of resilient crop seeds failing to persist.

- **Grazing**

This method does nothing to control the growth or spread of buffelgrass; rather, the method seeks to contain it. It contradicts the City's current no-grazing policy on these lands, and may pose risks to compliance with the HCP. Additionally, there are parties concerned with the health of the animals used for grazing, as there is no nutritional value for them in consuming buffelgrass. Relative costs were not assessed.

- **Control Burns**

This method could be used to either contain or control buffelgrass. The control method would include either follow-up herbicide treatment or reseeding. Risks with this method include the invigoration of buffelgrass and the inability to treat within timeframe or failure for seeds to persist, and concerns about maintaining fire control. Relative costs could not be calculated due to undetermined required equipment and safety costs.

Next Steps:

TW is coordinating a communications plan regarding the noxious weed abatement schedule with our land managers. The communications plan includes physically flagging the area intended for aerial spraying, and an electronic and print notification reflecting the time-line for aerial spraying. To ensure the safe and effective application of the herbicide it is imperative that those applying it be responsive to changes in the environment in which they are spraying. As aerial spraying is dependent upon weather conditions up to the actual application, no specific dates can be provided or guaranteed.

Summary:

The coordination of multiple agencies is required if the greater Tucson area has any chance to successfully manage buffelgrass. The collective efforts of the City of Tucson, Pima County Natural Resources, City of Tucson Parks and Recreation, the U.S. Bureau of Land Management, the U.S. Forest Service, the U.S. National Park Service, U.S. Fish and Wildlife, and the University of Arizona work to control both the presence and dispersion of buffelgrass.

There are many factors to bear in mind when considering mitigation of buffelgrass on TW's retired farm properties. Amongst those factors are: human health, safety of the product/process, location/density/green-up of weeds (monitored weekly), rehabilitation of the land, effectiveness and efficiency of treatment, effects to the surrounding area, and associated costs. TW has considered alternatives for the mitigation of buffelgrass on its properties but has yet to find a reasonable alternative. The Utility will continue to consider alternatives to the current method of treatment and is open to suggestions. Any alternative solutions proposed for the mitigation of buffelgrass will continue to be reviewed.

As in all things, safety is our top priority. TW will continue to consider all of the variables associated with the treatment of buffelgrass and proceed in the manner best suited for the safe and effective mitigation of this highly invasive noxious weed. Taking into consideration all known variables, and present circumstances, the Utility will continue to execute its aerial herbicide spraying program, in conjunction with increased communication efforts.