

# **Transportation and Environmental Challenges Associated with the Proposed State Highway 45 Southwest**

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## **Transportation Challenges**

The City of Austin has a long and sometimes controversial history of active participation in issues related to the proposed SH45 SW project. Mobility is recognized as a major concern by the residents and businesses of Austin and the future sustainability of our region depends on a diverse range of travel options, including complete roadway networks serving the movement of people, goods and services. Incomplete roadway networks contribute to regional traffic congestion and increase mobile sources of air pollution. The SH45 SW project may provide significant improvement in east-west mobility in the area and alternatives to provide this service through existing roadways may be problematic. For this reason, the City encourages TxDOT to consider the regional consequences of building the highway, as well as not building it, from a balanced mobility and environmental standpoint.

The Capital Metropolitan Planning Organization (CAMPO) is the regional body that is charged with making regional transportation decisions and for coordinating transportation investments among agencies in five Central Texas counties. CAMPO also plays a direct role in the distribution of Federal Highway Administration funds within the region. The CAMPO Policy Board, which has City of Austin voting representation, recently adopted the 2035 Regional Transportation Plan to guide transportation planning and investment throughout the region. The CAMPO 2035 Plan includes two “self-discipline” provisions that state:

1. “For a CAMPO member jurisdiction to receive federal-aid funding under this plan, their local transportation plan or the transportation element of their comprehensive plan must be consistent with the CAMPO Long Range Plan.
2. For a CAMPO member jurisdiction to receive federal-aid funding under this plan, the jurisdiction must adhere to the policies of and work toward implementing the projects of the CAMPO long range plan.”

Importantly, the 2035 Plan calls for preparation of an environmental assessment for an extension of SH45 SW from the southern terminus of MoPac to IH-35. Funding for the environmental assessment and potential construction of the portion from MoPac to FM 1626 is programmed in

the 2035 Plan. However, for the segment from FM 1626 to IH-35, funding is programmed only for the environmental assessment and for design studies.

### **Environmental Challenges**

For more than two decades the City of Austin, with broad community support, has enacted policies and made significant investments in the protection of water quality in the Barton Springs Zone of the Edwards Aquifer. Measures taken include:

- Implementation of the citizen-initiated Save Our Springs ordinance, which limits impervious cover and requires non-degradation levels of stormwater treatment for development of sites in the Barton Springs Zone;
- Negotiation of various development agreements to achieve the intent of the SOS ordinance;
- Investment of \$143 million in voter-approved bonds (to date) in the acquisition and preservation of 27,000 acres of land in the recharge and contributing zones; and
- Commitment, both legally and financially, to protect rare and endangered species pursuant to two permits issued under the Federal Endangered Species Act.

The City of Austin's Watershed Protection Department (WPD) and Austin Water Utility (AWU) Wildland Conservation Division staff have engaged in previous discussions about the development of SH45 SW. These include review of proposed TxDOT highway alignments and designs, identification and evaluation of critical environmental features in proximity to proposed alignments, identification of advanced stormwater quality controls, and evaluation of prior environmental impact assessments. Of particular concern are the potential impacts of the project, both during construction and in its operation, on both water quantity and water quality in Barton Springs Zone. Secondary development and associated impacts may potentially occur in portions of the recharge zone as a result of easier access through SH45 SW. Current scientific understanding of the hydrogeology of the Barton Springs Zone underscores these concerns, which are discussed further below.

### **Recharge to Barton Springs**

Studies have demonstrated that a high percentage of rainfall in the area of the proposed SH45 SW directly recharges the Edwards Aquifer (Hauwert, 2009). Roughly two-thirds of the 8,300-foot segment from Mopac South to Bear Creek crosses internal drainage sinkhole basins that supply recharge to the Edwards Aquifer. There are fourteen identified caves within one-quarter of a mile of the proposed designated right-of-way (ROW). The density of major recharge features (caves and large sinkholes) is about 10 per square mile, one of the highest densities found in the recharge zone. The main channel of Bear Creek downstream of SH45 drainage contains swallets (creek-channel sinkholes) that directly recharge the aquifer in the range of 10 to 20 cubic feet per second when Bear Creek is flowing. These swallets are prone to plugging by fine-grained sediment, which reduces recharge and may be irreversible.

## **Proximity to Local Public and Private Water Supply Wells**

The Barton Springs Zone of the Edwards Aquifer is a designated sole source aquifer under the Federal Safe Drinking Water Act. The proposed State Highway 45 Southwest (SH45 SW) is within the City's Drinking Water Protection Zone, not the Desired Development Zone. There are numerous public and private water supply well systems that lie downgradient of SH 45 SW. Contaminated stormwater runoff has the potential to impact drinking water supplies in portions of Shady Hollow, Copper Hills, SW Territory, and Marbridge Foundation (see attached map of well recovery from 2007 dye tracing). Of note is that the Edwards Aquifer is understood to provide little natural attenuation of contaminants, except by dilution with natural runoff sources (Hauwert, 2009).

## **Proximity to BCCP Protected Cave**

The Balcones Canyonlands Preserve system (BCP) was established by the City of Austin and Travis County to protect various rare, threatened, and endangered species. The BCP holds an 'incidental take' permit under the Federal Endangered Species Act. By providing species protection on preserve lands, land development in other areas is possible without site-specific incidental take permits.

One of the sinkhole basins that the SH45 ROW bisects is the 70-acre catchment area for Flint Ridge Cave. The SH 45 SW ROW passes within 150 feet of the cave entrance and passes over portions of the subsurface extent of the cave (Hauwert et al., 2010; see attached map of Flint Ridge surface catchment). The cave provides habitat for rare troglobitic karst invertebrates including *Circurina cueva* and *Rhadine austinica*, both of which are listed as species of concern (SOC) under the City's Balcones Canyonlands Conservation Plan (BCCP) permit. Potentially other SOC have been observed in Flint Ridge Cave during faunal surveys, including *Eidmannella reclusa* and *Speodesmus N. S.*, although further biological investigation is necessary to distinguish the specific species present in the cave. One major goal of the BCCP is to adequately protect the habitat for these rare cave species thus negating the need for listing as endangered. If the BCCP is unable to protect these species then future listing by USFWS is a possibility. The City and Travis County could also incur fines under the Endangered Species Act for failure to protect this cave habitat and the permit itself may need to be amended, which could have implications for development city-wide.

## **Endangered Species Protection at Barton Springs**

The City of Austin also holds an incidental take permit from the U.S. Fish and Wildlife Service (USFWS) for the endangered Barton Springs Salamander (*Eurycea sosorum*). It is expected that the Austin Blind Salamander (*Eurycea waterlooensis*), which like the Barton Springs Salamander is found only at Barton Springs, will also be listed as endangered. Dye tracer studies in the vicinity of the SH45 SW alignment have demonstrated a strong hydraulic connection with Barton Springs. Four groundwater tracers injected around Highway 45 and Mopac South in 2007 initially arrived at Barton Springs within two to four days. Long-term monitoring indicates that there has been some decline in water quality in the Barton Springs Zone (Mahler et al., 2006; Herrington et al., 2010; Mahler et al., 2011).

## **Non-Degradation Water Quality Controls**

City of Austin staff requested by correspondence (Heitz, 2001 and 2005 meeting summary link below) that TxDOT commit to non-degradation standards for water quality for SH45 SW, and to

consult with City staff in defining nondegradation standards and water quality protection measures for the project. Working with TxDOT, advanced stormwater controls were determined to be capable of removing 94 percent of the estimated pollutant load that would be discharged offsite from the proposed roadway. TxDOT responded that it will implement only those sediment removal standards that are required by the Texas Commission on Environmental Quality (TCEQ) and that some other party (e.g., the City of Austin) would need to fund the incremental costs of more advanced treatment, including additional land acquisition outside the right-of-way (Nyland, 2007).

It should be noted that the USFWS has developed “Recommendations for Protection of Water Quality of the Edwards Aquifer” that are adopted by reference for SH45 SW in the Austin Metropolitan Area Transportation Plan (AMATP) 2025 Plan ([link below](#)). These measures have not yet been considered in the design or cost estimates for the project.

### **Monitoring, Assessment, and Adaptive Management**

Because of the environmental sensitivity of the SH45 SW alignment, ongoing monitoring and assessment will be necessary to ensure protection of federal permit caves, Water Quality Protection Lands, nearby water wells and creeks, and Barton Springs. The Environmental Impact Statement (EIS) for SH45 SW, which was issued in 1989, is out of date and some impact assessments performed at that time were scientifically flawed. TxDOT consultants also performed studies in 2006 to assess the potential impacts of the highway. The methodology used in studies released thus far was also insufficient and no technical review by qualified stakeholders was solicited.

TxDOT is currently working with consultants to begin a new EIS compliant with federal laws. Because the scope of the EIS is uncertain, the City of Austin may be required to make considerable investment in studies, monitoring, water-quality treatment, and restoration projects commensurate with the sensitivity of the project area. The City and the Barton Springs/Edwards aquifer Conservation District (BS/EACD) have conducted assessments of most of the City WQPL adjacent to SH45 SW to locate recharge features, although additional evaluation of the most promising features, such as trash/debris excavation and subsurface mapping, still remains. Additionally, under the BCCP permit the USFWS would require that permit holders conduct a hydrogeological study of water sources to Flint Ridge Cave to demonstrate whether or not the project will affect cave habitat. This generally requires surface tracing to the cave drips and direct measurement of soil attenuation of pollutants. Additional biological studies are necessary to better understand and monitor cave species. Flow and water quality stations may also be necessary on Bear Creek upstream and downstream of SH45 SW crossing to monitor discharge quality and to suggest adaptive management changes to the roadway cross section, design details, construction methods, or water quality controls. In addition, this monitoring may help detect if recharge within the creek channel becomes blocked from roadway construction sediment signaling the need for adaptations in water resource management protection measures.

Labor, funding, and equipment may be necessary to regularly remove sediment discharged from SH45 (particularly during the construction phase) and to maintain creek recharge volume. If creek recharge impairment is permanent and significant features cannot be unplugged or bypassed, it may be possible to acquire and restore/enhance the recharge of upstream reaches or other creeks in order to offset the lost recharge to the aquifer. Flow and water quality monitoring of Flint Ridge Cave will need to continue through the life of the highway operation. If TxDOT does not participate significantly in the costs of these studies, water-quality treatment, and restoration, the

City of Austin, Travis County, and the Barton Springs/Edwards Aquifer Conservation District (BS/EACD) will need to commit resources to address this need.

## **Summary**

The current proposed alignment of the highway “threads the needle” between impacts to Bear Creek and the federally-protected Flint Ridge Cave. While development of any major roadway will alter the natural landscape, it is technically feasible to avoid, minimize, and mitigate impacts in a manner consistent with a goal of non-degradation. This will require a thorough evaluation of potential adverse impacts, alignment, adoption of innovative highway design concepts to avoid, minimize, and mitigate impacts, use of advanced stormwater quality controls to achieve a non-degradation standard, and an adaptive management strategy to address observed impacts during construction and afterward. If necessary to the environmental protection of the SH45 SW area, we would potentially be willing to discuss financial participation in this project, if directed to do so by the City Council.

Meeting the current and future transportation needs of southern Travis and northern Hays poses significant challenges, not the least of which is development and operation of new roadways in an environmentally sensitive area. Completion of SH45 SW is one alternative available to help meet that challenge. The City supports use of the NEPA process as a tool to provide decision-makers with a balanced evaluation of the potential benefits, costs, and impacts of SH45 SW and its alternatives. And the City expects to be a full partner, along with other entities in the region, in the federal environmental review process. In addition to evaluating the potential benefits and impacts of the project as currently envisioned, the City supports a thorough evaluation of alternatives to the project. This includes alternative alignments, improvements to existing roadways, and the “no build” alternative. Projected mobility and air quality impacts of each alternative should be fully considered.

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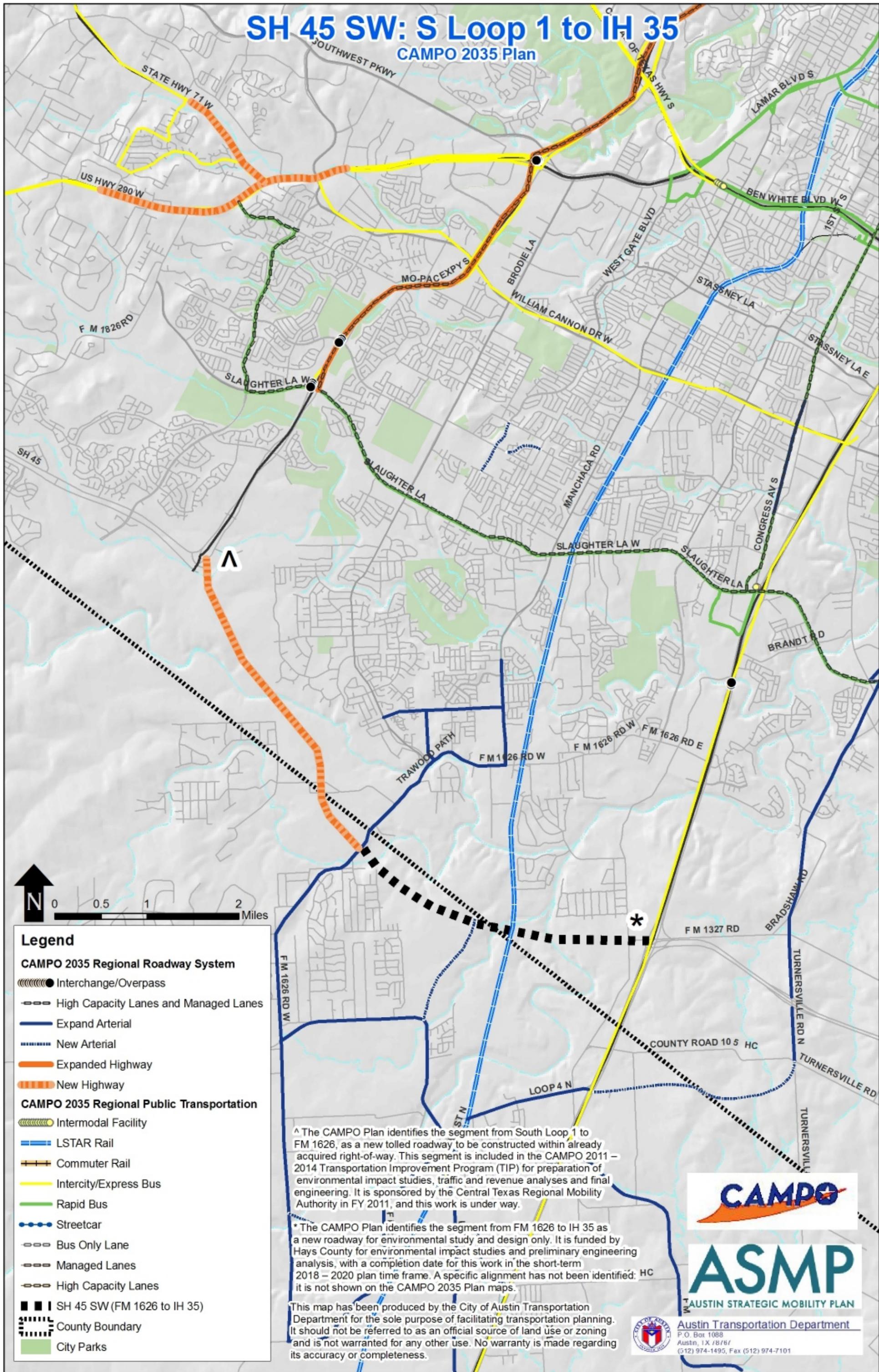
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# SH 45 SW: S Loop 1 to IH 35

## CAMPO 2035 Plan



^ The CAMPO Plan identifies the segment from South Loop 1 to FM 1626, as a new tolled roadway to be constructed within already acquired right-of-way. This segment is included in the CAMPO 2011 – 2014 Transportation Improvement Program (TIP) for preparation of environmental impact studies, traffic and revenue analyses and final engineering. It is sponsored by the Central Texas Regional Mobility Authority in FY 2011, and this work is under way.

\* The CAMPO Plan identifies the segment from FM 1626 to IH 35 as a new roadway for environmental study and design only. It is funded by Hays County for environmental impact studies and preliminary engineering analysis, with a completion date for this work in the short-term 2018 – 2020 plan time frame. A specific alignment has not been identified; HC it is not shown on the CAMPO 2035 Plan maps.

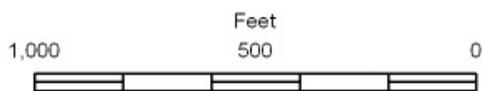
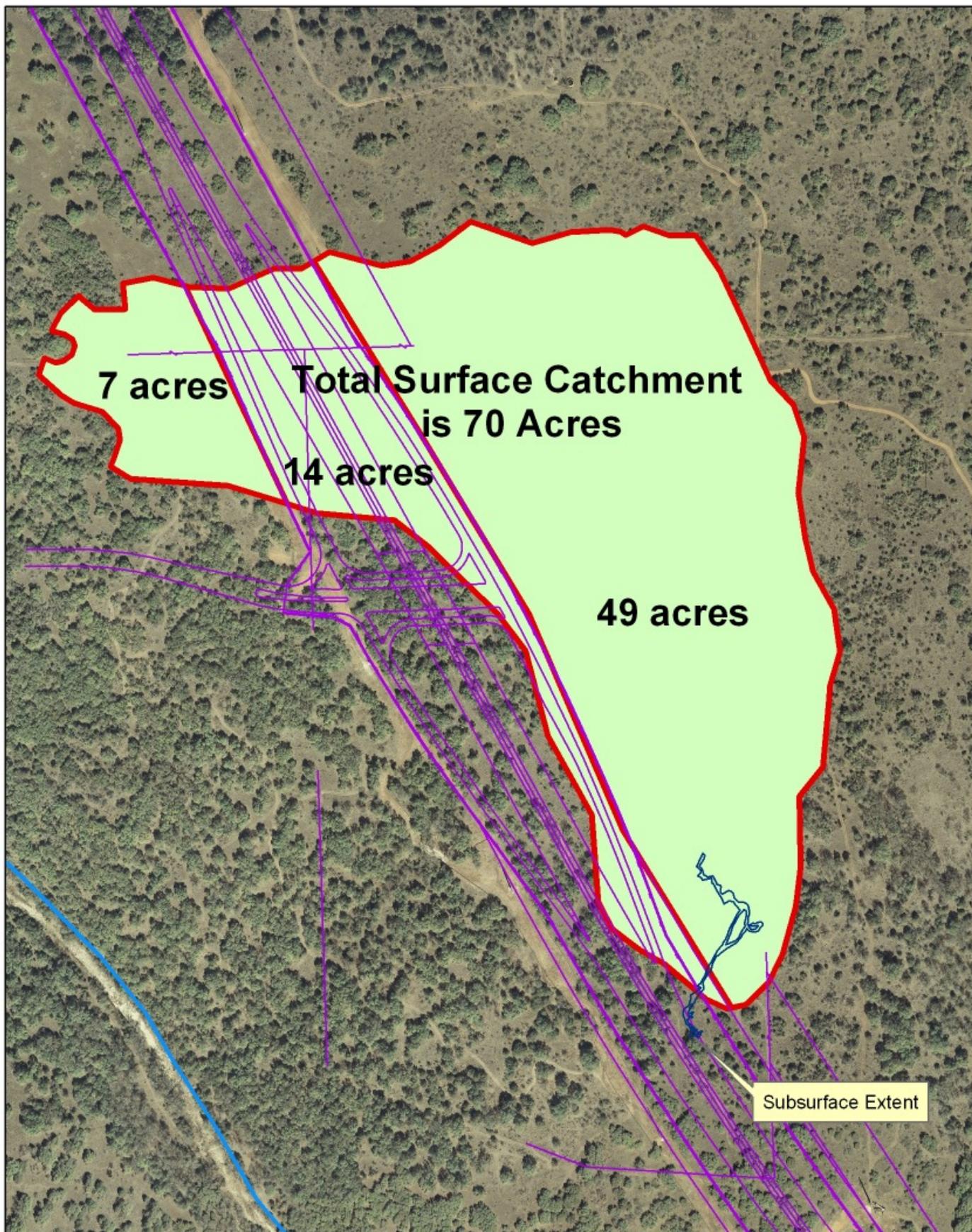
This map has been produced by the City of Austin Transportation Department for the sole purpose of facilitating transportation planning. It should not be referred to as an official source of land use or zoning and is not warranted for any other use. No warranty is made regarding its accuracy or completeness.



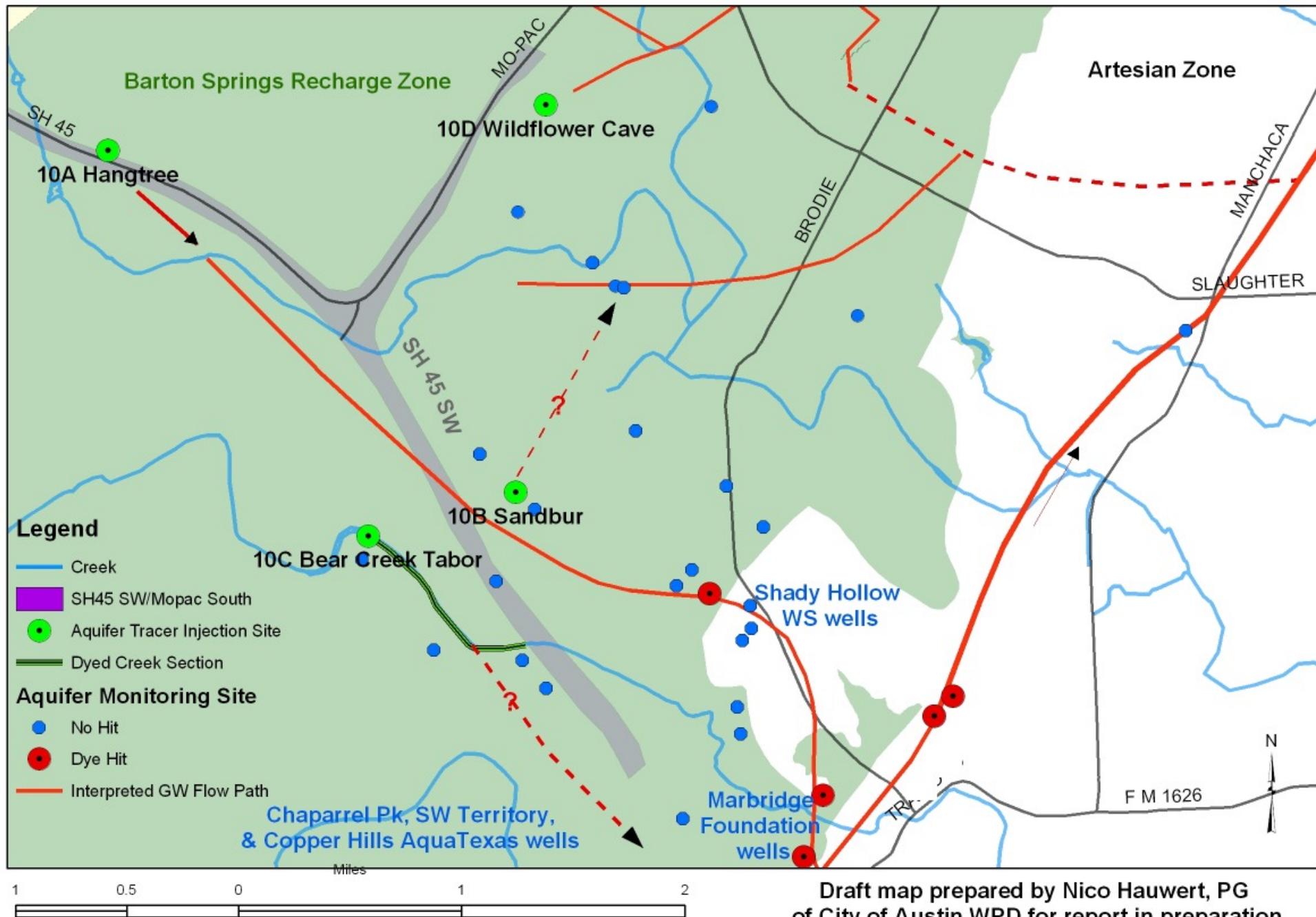
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# Flint Ridge Surface Catchment Dissected



# Well Recovery of 2007 Groundwater Traces



Draft map prepared by Nico Hauwert, PG of City of Austin WPD for report in preparation