

Project: Duval Property Pond Modifications

**Project Name**

Duval Property Pond Modifications

**Project Description**

Breaches (2) of an existing berm, construction of a diversion berm, and modifications to an existing set of excavated ponds to retain additional stormwater runoff

**Potential Project Partners**

Pima County Regional Flood Control District (PCRFCDD)  
Natural Resources Conservation Service  
Altar Valley Conservation Alliance

**Purpose of the Project**

To release stormwater runoff that is currently being impounded behind an existing berm, and to direct those flows towards a set of previously excavated ponds for beneficial use by livestock and wildlife

**Relationship to Goals/Desired Conditions of the Watershed Framework**

Indicate which goals/desired conditions the project will help to achieve from [this list](#). Insert the number of the desired condition below (ex: 1a)

3a, 3c, 3d, 3f, 4b, 4d, 5g, 7c

**Value**

This project will decrease runoff ponding that is currently being impounded behind an existing earthen berm and direct the runoff to a location where it can benefit agricultural and wildlife needs. Additionally, retaining runoff stormwater in the ponds will serve to reduce the amount of flows ultimately causing erosion along the bank of the main stem Altar Wash.

**Implications of no Action**

Continued ponding above the earthen berm and possible failure if overtopping is experienced, continued erosion at the main stem bank

**Work and/or Studies to Date**

A 2-dimensional rainfall/runoff model of the entire contributory watershed was created using FLO-2D and a 20-foot grid size. This model was used to characterize flow patterns and dynamics under various return-interval storms, for existing and proposed (with project) conditions. The proposed conditions model was used to substantiate the concept by locating the berm breach and facilitate estimation of diversion berm geometry and construction costs. Refer to Figures 4 and 5 for depiction of the results of the flood modeling under existing and proposed conditions.

### **Project Area and Site Conditions**

The proposed pond modifications are located on parcel 301-19-006A which is owned by the City of Tucson. The existing ponds were excavated as pilot projects associated with construction of the Central Avra Valley Storage and Recovery Project (CAVSARP) which is operated by Tucson Water. Four ponds are within the identified footprint, although 2 are not excavated. Refer to Figures 1 and 2 for Project Location and Site Maps.

The location of the project work is typical Sonoran desert rangeland, with sparse vegetation including grasses, cacti, and mesquite trees.

### **Project Activities**

Construction of the project involves excavation of two portions of the existing berm located along the southern property line and installation of erosion protection at the constructed breaches. The proposed berm can be constructed using excavated material sourced from the completion of the two ponds that are currently not excavated, subject to geotechnical testing results proving the excavated material is suitable for use as berm fill. Impermeable pond liner is proposed as an option to retain runoff collected in the ponds, for prolonged beneficial use by livestock and wildlife.

The following were assumed for the purposes of concept layout: 3' overexcavation depth below the berm, use of the native soil and local borrow for engineered fill, berm top width of 4', side slopes of 4H to 1V, maximum berm height of 3.0' (including 1' freeboard). Those assumptions will require refinement during engineering design.

The concept is presented on Figure 3 – Concept Project Layout. Figures 4-5 provide additional details regarding the project concept for this location.

**Project Timeline & Estimated Costs**

<p><b>Planning, Design/Engineering, &amp; monitoring plan, permitting</b></p>	<p><b>Implementation/ Construction</b></p>	<p><b>Monitoring</b> (post-implementation)</p>	<p><b>Maintenance</b> (post-implementation)</p>
<p><i>Activities: Survey, Engineering Design</i></p>	<p><i>Activities: Berm Breach, Berm Construction, pond Excavation</i></p>	<p><i>Activities: Inspect for damage</i></p>	<p><i>Activities: Repair damage as needed</i></p>
<p><i>Duration: 4 months</i></p>	<p><i>Duration: 4 months</i></p>	<p><i>Cycle: Annual and after each significant flow event.</i></p>	<p><i>Cycle: Annual or as-needed</i></p>
<p><i>Estimated cost:</i>  <input type="checkbox"/> &lt;\$10k  <input checked="" type="checkbox"/> <b>\$10k - \$100k</b>  <input type="checkbox"/> \$100k - \$500k  <input type="checkbox"/> \$500k - \$1 million  <input type="checkbox"/> &gt;\$1 million</p>	<p><i>Estimated cost:</i>  <input type="checkbox"/> &lt; \$10k  <input type="checkbox"/> \$10k - \$100k  <input type="checkbox"/> \$100k - \$500k  <input type="checkbox"/> \$500k - \$1 million  <input checked="" type="checkbox"/> <b>&gt;\$1 million</b></p>	<p><i>Estimated cycle cost:</i>  <input type="checkbox"/> &lt; \$1,000  <input checked="" type="checkbox"/> <b>\$1 -10k</b>  <input type="checkbox"/> \$10k - \$100k  <input type="checkbox"/> \$100k - \$500k</p>	<p><i>Estimated cycle cost:</i>  <input type="checkbox"/> &lt; \$1,000  <input checked="" type="checkbox"/> <b>\$0 -10k</b>  <input type="checkbox"/> \$10k - \$100k  <input type="checkbox"/> \$100k - \$500k</p>

**Estimated Service Life**

25 years

**Potential Funding Sources**

Pima County Regional Flood Control District (PCRFCDD)  
 Natural Resources Conservation Service (NRCS)  
 AZGFD Habitat Partnership Committee grants

**Required Permits**

Pima County Regional Flood Control District (PCRFCDD) Floodplain Use Permit

Figure 1 - Project Location Map

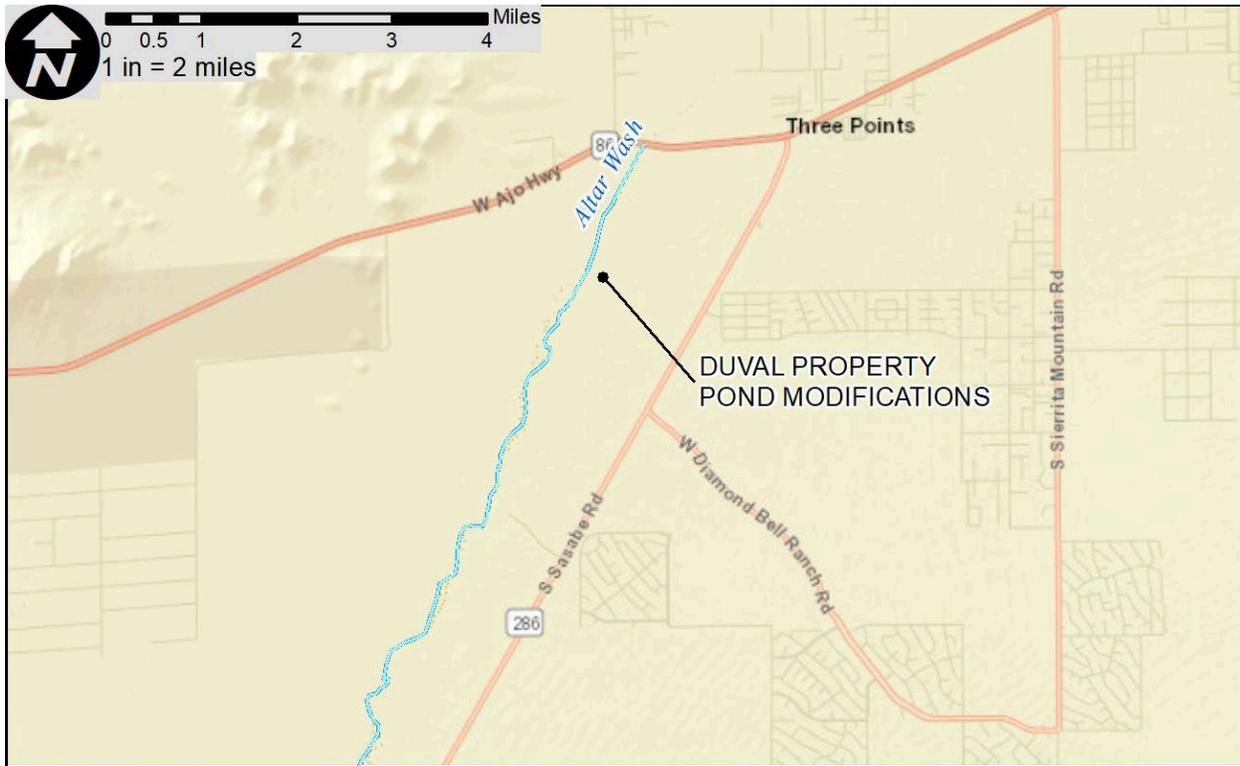


Figure 2 – Site Map

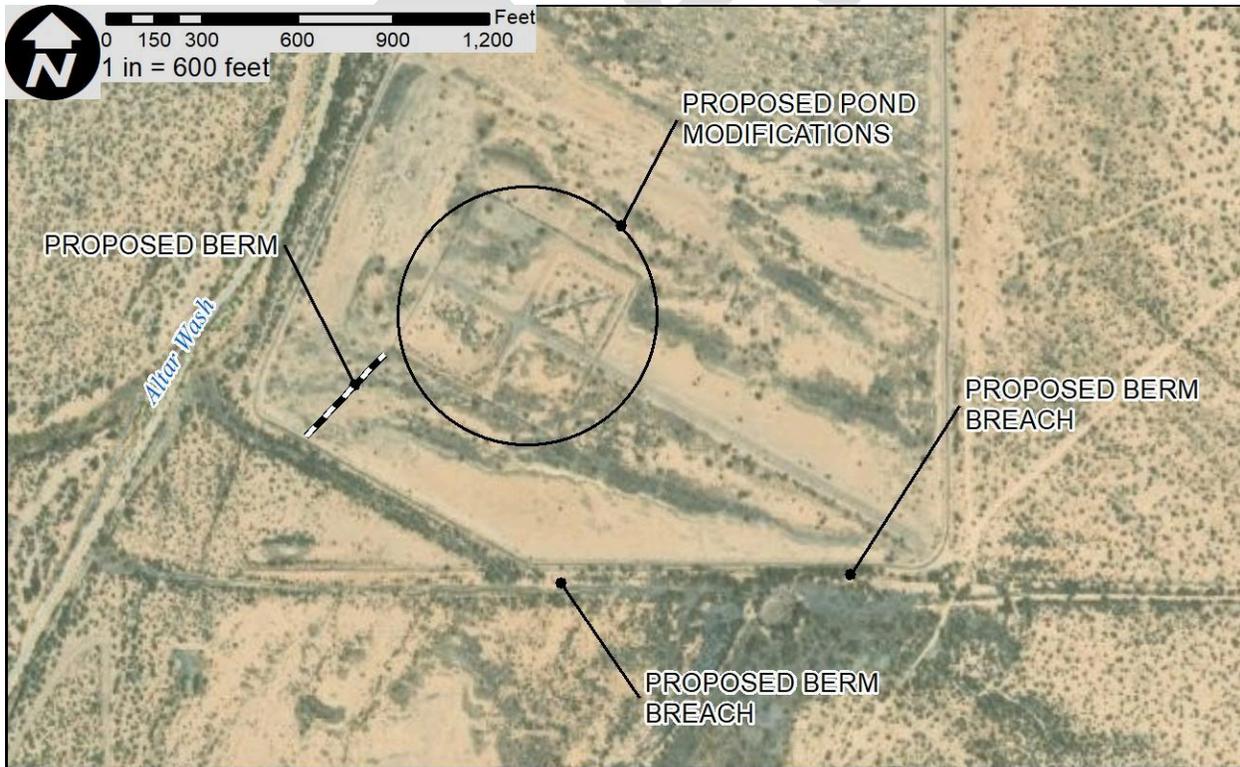


Figure 3 – Project Layout

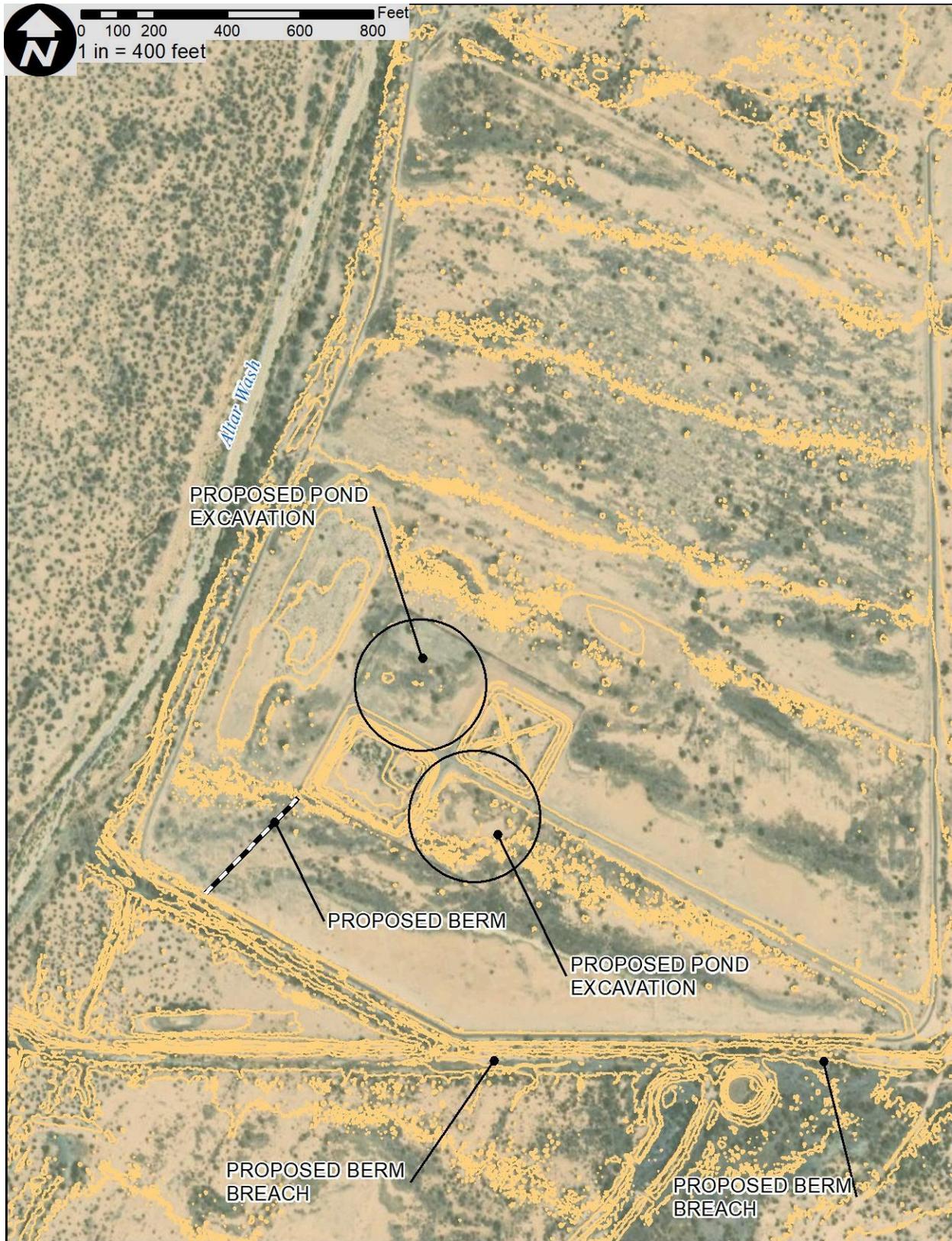


Figure 4 – Existing Conditions 10-Year Flood Modeling

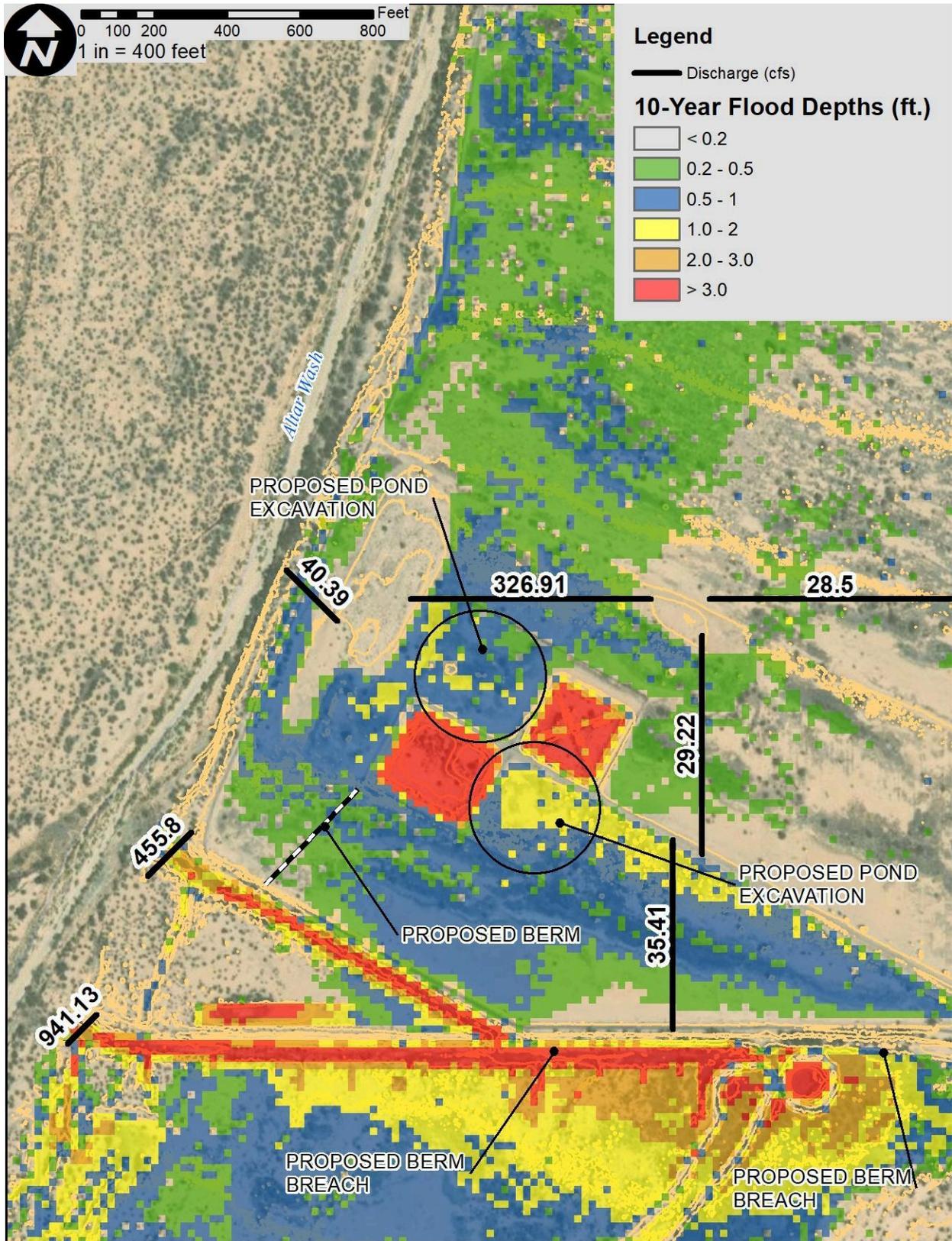


Figure 5 – Proposed Conditions 10-Year Flood Modeling

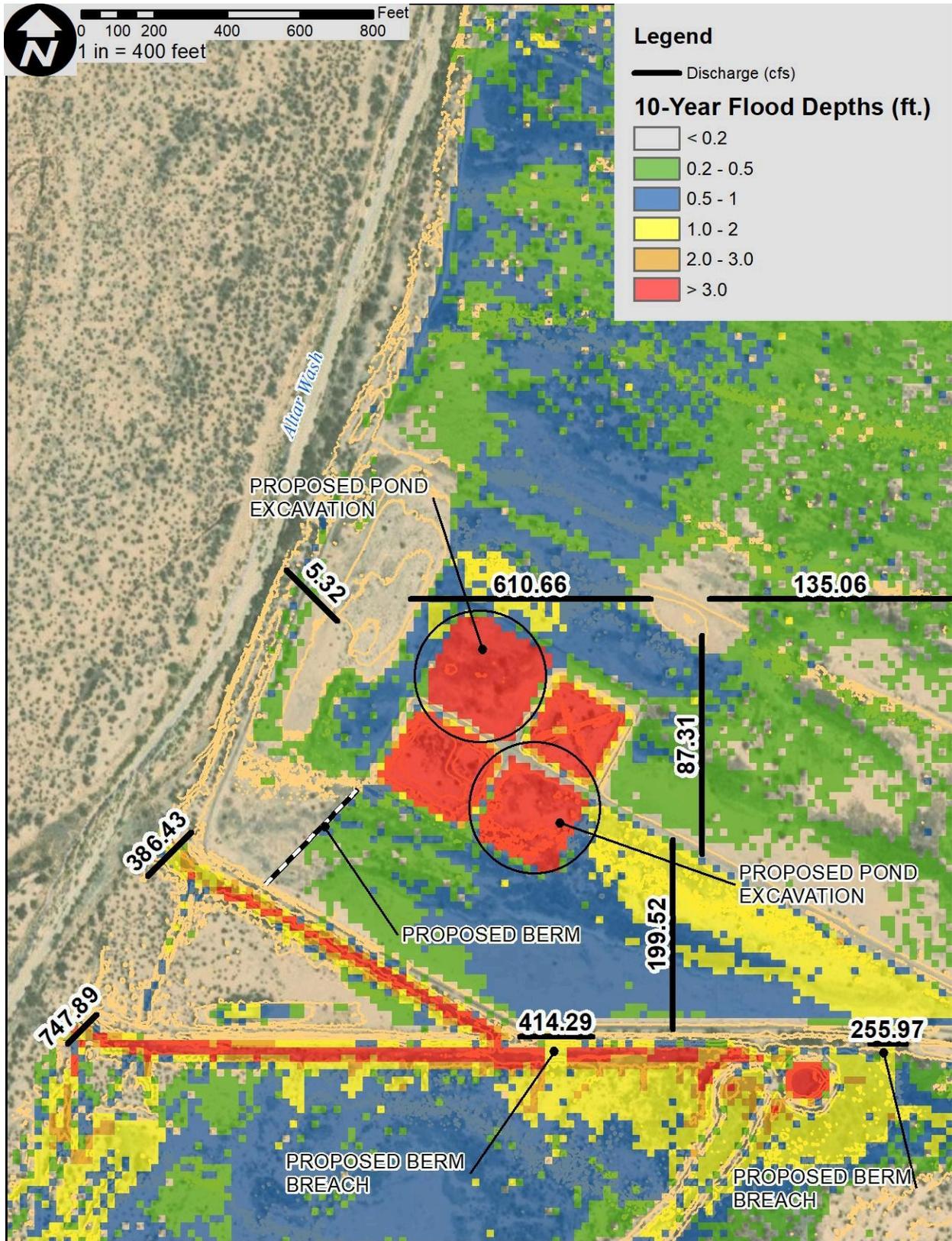


Figure 6 – Existing Conditions 100-Year Flood Modeling

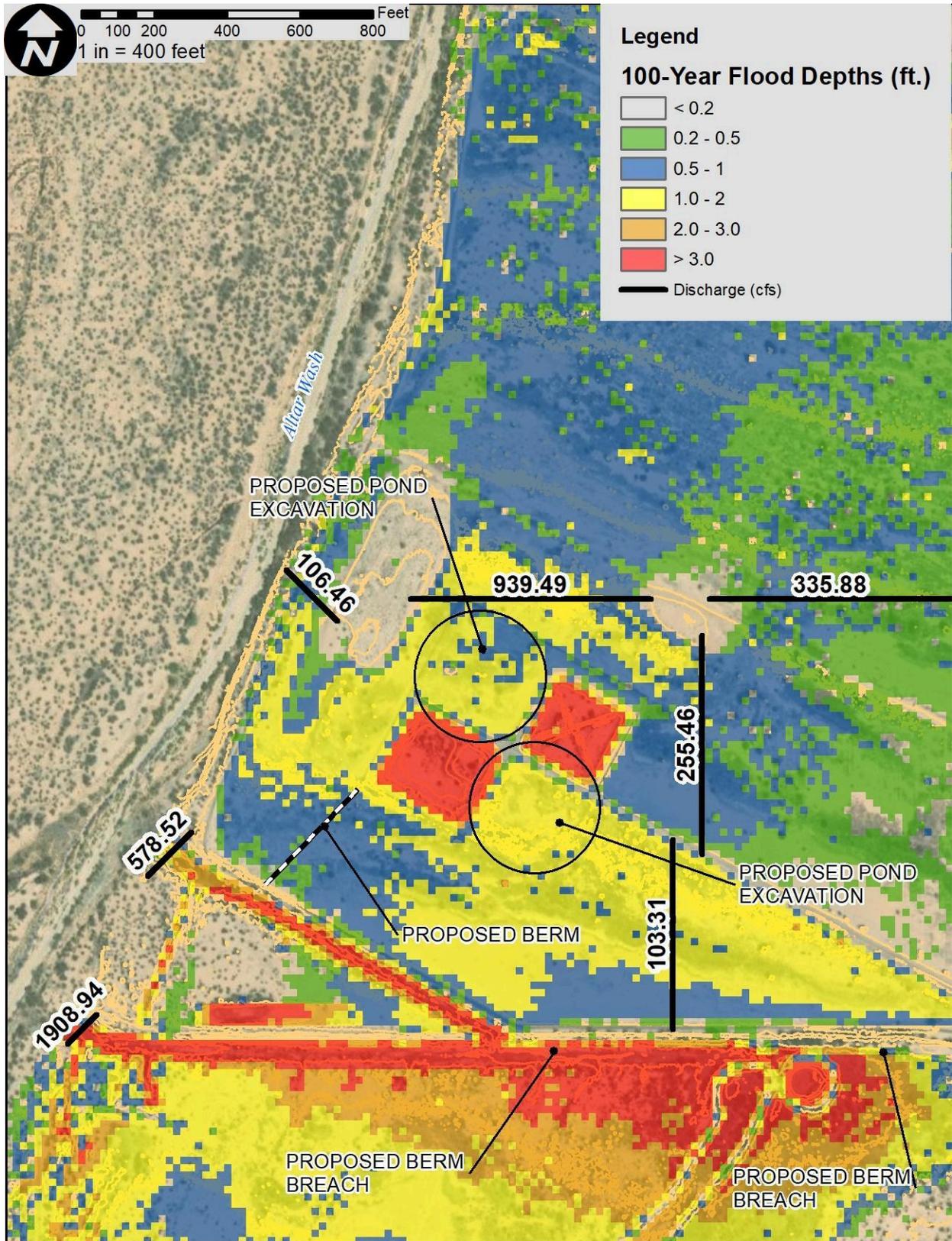


Figure 7 – Proposed Conditions 100-Year Flood Modeling

