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September 29, 2022

Lucinda Andreani, Administrator  
Coconino County Flood Control District  
5600 E Commerce Ave  
Flagstaff, AZ 86004

Dear Lucinda,

The Government Tank watershed long-term mitigation conceptual drainage improvements for “Hutchison Acres Tract C Detention Basins”, “Hutchison Acres Tract B Detention Basin” and the channels associated with “Johnson Ranch Tract A Detention Basin” follows. A summary of the suggested improvements is provided with reference to associated conceptual design plan sheets, conceptual design engineers’ opinion of probable costs (EOPC), and conceptual construction schedule.

#### **Improvements West of US Highway 89**

The Hutchison Acres Tract C Detention Basin improvements have been designed around using the existing “Tract C” of the “Hutchison Acres” sub-division. Tract C is approximately 15 acres in area, with identified use as “open space” and “drainage”. Currently, Tract C is undeveloped apart from a private drive, Provided Way, running from Highway 89 to the private parcels on the west side of this tract. Hutchison Acres Tract C Detention Basin has been separated into south and north detention basins by Provided Way, both detention basins combined have an approximate static storage volume of 71.4 acre-feet. In addition, the expansion of the existing detention basin on “Tract B” of the “Hutchison Acres” sub-division, referred to as “Hutchison Acres Tract B Detention Basin” is expected to add approximately 21.2 acre-ft of static runoff storage. It is expected that the combination of these detention basins with the two separate discharge locations will stop the runoff of the 2-inch 45-minute storm event from overtopping Highway 89 at this location.

The south “Hutchison Acres Tract C Detention Basin” is expected to provide approximately 57.7 acre-feet of static runoff storage. The flows coming from the Forest Service will pass through a proposed shot-crete channel, “Government Tank North Channel” extending from the Forest Service boundary through private property to discharge into Hutchison Acres Tract C Detention Basin.

Discharge will be handled via the existing triple barrel 8’x4’ concrete box culvert under Highway 89 which will convey approximately 1,000 cfs, and a proposed 12’x4’ concrete box culvert in the proposed realigned Provided Way which will convey approximately 450 cfs.

The north “Hutchison Acres Tract C Detention Basin” is expected to provide approximately 13.7 acre-feet of static runoff storage. The flow will predominately enter through the 12’x4’ box culvert in Provided Way, with some flow entering from the Hutchison Acres sub-division. The north “Hutchison Acres Tract C Detention Basin” will continue to serve as the detention basin for the Hutchison Acres sub-division while providing additional storage for post Pipeline Fire flood flows. Discharge from this detention basin will be handled via a 12’x4’ concrete box culvert in Henry Drive to the existing detention basin “Hutchison Acres Tract B Detention Basin”. In addition to these improvements there



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will be individual lot mitigation necessary for nine homes in the Switchback Trail and Heppel Drive area just south of the “Government Tank North Channel”.

The conceptual cost of the improvements “West of US Highway 89” work is anticipated to be \$12,090,709. Construction of the “Hutchison Acres Tract B Detention Basin” expansion could begin as early as Spring ’23 and construction of the “Hutchison Acres Tract C Detention Basin” items could begin Fall ’24 and completed Spring ’25.

### **Improvements East of US Highway 89**

The “Treadway Channel” and the “Swede Channel” discharge to the Johnson Ranch Tract “A” Detention Basin. The “Treadway Channel” is designed to convey the flow from the existing triple barrel 8’x4’ concrete box culvert under Highway 89, that is serving as the primary discharge of Hutchison Acres Tract C Basin, with some flow entering via adjacent properties. The Treadway Channel is expected to convey approximately 1,000 cfs of flow.

The “Swede Channel” is designed to convey the flow from the existing 36-inch CMP culvert under Highway 89 south of Northfork Road, serving as the primary discharge point of the Heppel and Switchback neighborhood. The Swede Channel is expected to convey approximately 350 cfs of flow. In addition to these improvements there will be individual lot mitigation for two homes in Swede Acres and four homes along Treadway Trail.

Discharge from these two channels will be directed to both the north and south sides of the Johnson Ranch Tract A detention basin.

The conceptual cost of the channels associated with the “Johnson Ranch Tract A Detention Basin” work is anticipated to be \$3,178,579. Construction of the Swede Channel and Treadway Channel could begin Spring ’24 and completed Fall ’24.

### **Damage to Existing Structures**

The existing drainage infrastructure in Highway 89 has been holding up during the first post-Pipeline Fire flood events and monsoon season. There are some areas that have been seeing increased flows, causing scour at the outlets of the existing structures.

The outlet of the triple barrel 8’x4’ concrete box culvert, as shown in the following images, has experienced scour and some undercutting of the box to the point of exposed utilities.







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The outlined detention basins and channels are part of the larger Government Tank flood mitigation system. When these items are built in conjunction with the proposed improvements to the Highway 89 drainage infrastructure; it is expected that this work will negate additional damage to Highway 89 and the structures associated with the Highway.

Please let me know if you have any questions or need additional information.

Thank you,

A handwritten signature in blue ink, appearing to read "Mark Lamer", is written over a light blue horizontal line.

Mark Lamer, PE  
Remal Consulting Principal Engineer

Attachments:

- Government Tank Conceptual Design Plan
- Hutchison Acres Tract C Detention Basin Conceptual EOPC
- Hutchison Acres Tract B Detention Basin Expansion Conceptual EOPC
- Swede Channel Conceptual EOPC
- Treadway Channel Conceptual EOPC
- Government Tank Conceptual Construction Schedule