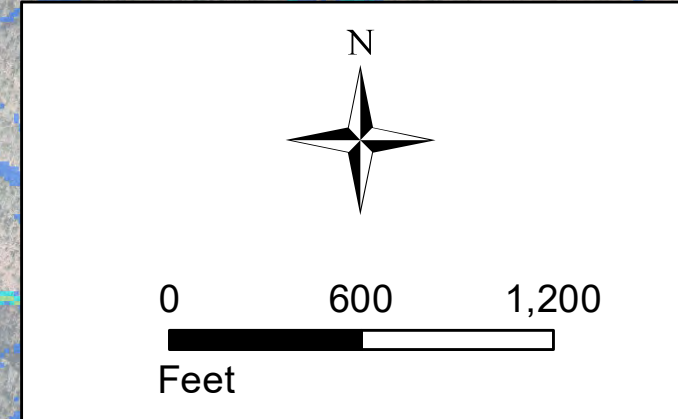
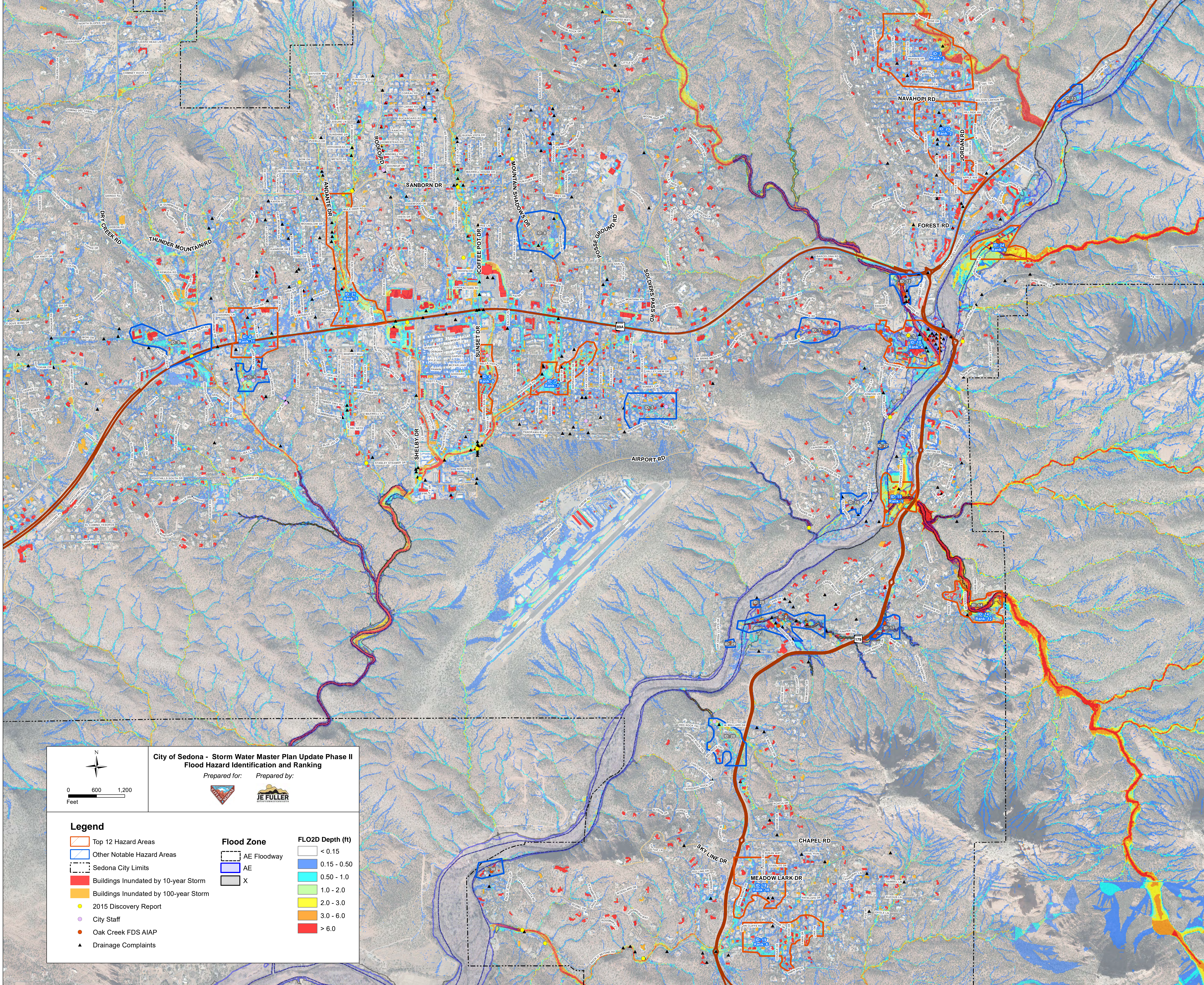


## **EXHIBITS**



**City of Sedona - Storm Water Master Plan Update Phase II  
Flood Hazard Identification and Ranking**  
Prepared for: Prepared by:

| Legend |                                       | Flood Zone | FLO2D Depth (ft) |
|--------|---------------------------------------|------------|------------------|
|        | Top 12 Hazard Areas                   |            |                  |
|        | Other Notable Hazard Areas            |            |                  |
|        | Sedona City Limits                    |            |                  |
|        | Buildings Inundated by 10-year Storm  |            |                  |
|        | Buildings Inundated by 100-year Storm |            |                  |
|        | 2015 Discovery Report                 |            |                  |
|        | City Staff                            |            |                  |
|        | Oak Creek FDS AIAP                    |            |                  |
|        | Drainage Complaints                   |            |                  |

## **APPENDIX**

## Sedona SWMPU Phase 2: Storm Water Mitigation Alternatives Brainstorming Notes

Black Font: Notes taken from 4/5/2021 JEF Internal Brainstorming with Jon Fuller, Joe Loverich, C. Cooper, R. Lyons

Blue Font: Notes taken from 4/8/2021 Brainstorming with David Peck, Andy Dickey, C. Cooper, R. Lyons

Purple, Bold Font: Ideas to carry through for Alternatives Development

Added by D. Peck 4/15/21

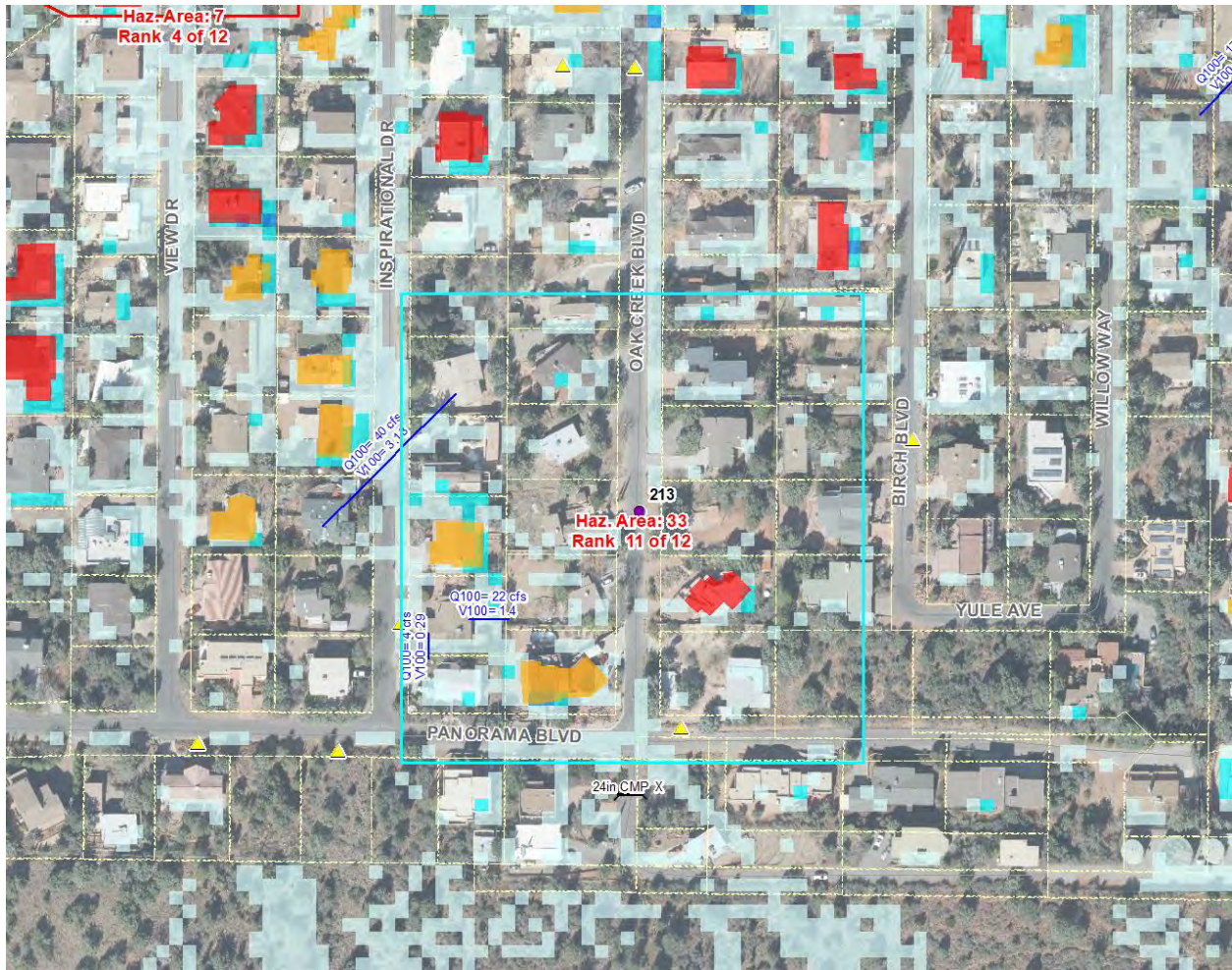
- **Rank #1 – HA 21 – Andante Dr & Moonglow Dr**
  - Possible storage opportunity at 735 Sunshine Lane (APN 408-22-402)
  - Possible storage opportunity – **50 Tranquil Ave.** (APN 408-24-087)
  - Redirect some flow from east of North Star Ln-Sanborn Dr and tap into Thunder Mtn. system (west of Andante-Th. Mtn.).
  - Capture flow east of North Star – Sanborn and route down North Star in storm drain.
  - Modify roadway (invert crown, add curb/increase curb height) and convey flow down Andante Dr.
  - Appears to be a channel/easement at Th. Mtn.-Sanborn knuckle, east of North Star.
    - Channelize flow from Th. Mtn. down to Mule deer to take some burden off of Th. Mtn. crossing.
  - Determine value of home at Th. Mtn. knuckle/bend.
    - Flood proof this house?
  - Add more barrels to existing culvert crossings from Th. Mtn. to 89a.
  - Vegetation removal and channel grading of ex. conveyance corridor from Th. Mtn. to 89A.
    - Consider ROW acquisition costs and possible environmental impact related costs.
  - Detention at source, just north of Sky View.
    - Forest Service Land.
    - Could be multi-functional
      - Stock tank
      - Wildlife watering hole
      - Park
  - The City is concerned with the idea of tapping into the existing Th. Mtn. system as it will be diverting flows into another watershed. Furthermore, there may be legal concerns with taking advantage of excess capacity that could otherwise be used for the system it was designed for. Also, the existing invert of the Harmony Phase 5 pipes at the inlet structure is 4488.0 and the flows to the east are a few hundred feet away and at a lower elevation than these Harmony 5 inverts.
  - Consider storage on the undeveloped 11 ac parcel. The current landowner is looking to develop the parcel but has access issues, perhaps a deal could be made for access if they include offsite detention as well. This parcel is just to the NE of the Risk Rank 12

polygon (along Sunshine Lane). I can't find a parcel this large in the area. Is this 735 Sunshine Lane (408-22-402)? If so, this parcel is 5.36 acres.

- Andy is concerned with the cost of a storm drain system down Andante.
- The City liked the idea of splitting the flow at the 'knuckle' and taking some flow down the backside of the 'Tranquil Ave. easement, from Sanborn to a few hundred feet north of the highway. After further thought, limit the diversion to Mule Deer where it would be taken back to the existing channel.
- The City might prefer maintaining current conveyance corridor alignment with a new storm drain under the wash and a new shared use path over the top or within the overflow channel.
- A storm drain under Andante should also be considered. The City may want to wait until Andante is 'rehabbed' with new asphalt and do the project at that time.
- 2012 2" mill and overlay, north of Thunder Mountain. 9 years since last improvement.
  - Typical repaving = every 20 years.
- **Rank #2 – HA 20 – SR 179 & Mallard Dr**
  - Need further clarification from City of Sedona.
    - Project extents from north parcel (southern Forest boundary) to
    - Upstream side of culvert on parcel 401-23-018
  - Several resident complaints upstream of lift station.
  - Increase channel capacity
  - Potentially increasing size of culvert crossings
- **Rank #3 – HA 32 – Back O' Beyond (B.O.B) & SR179**
  - Culvert crossing and raise road, consider channelizing a little further on the north side to get the culvert inlet a little further west to help the culvert skew and get past the existing driveway on the south side of the road crossing
  - Move road farther into hill slope to provide greater channel capacity.
  - Alternate/emergency access from Rosemary Ct to B.O.B. The HOA, private property owner and terrain would not allow for this bypass. Access through the construction area would need to remain intact during construction. This could possibly be done as it was for the Brewer Road Crossing Project where we used old culverts that the contractor had on hand to build a bypass road with some capacity for flow (don't construct during monsoon season).
  - Add flood breaks to B.O.B, and redirect traffic around, through Scenic Dr. during emergency/flood related events.
  - CIP to be designed in FY 22
    - Build in FY 23
  - City proposed taking some of the flow into a storm drain either diverting a portion from the new culvert crossing or diverting from where the channel is headed due north around the knob
  - Curb and gutter and inverted crown around the bend, may be problematic during wet weather though with flow in the travel lanes.
  - Expand HA polygon west past knob
- **Rank #4 – HA 5 – Saddle Rock Circ./Ln.**
  - Improvements here could benefit downstream hazard areas (HA 7; rank #4)

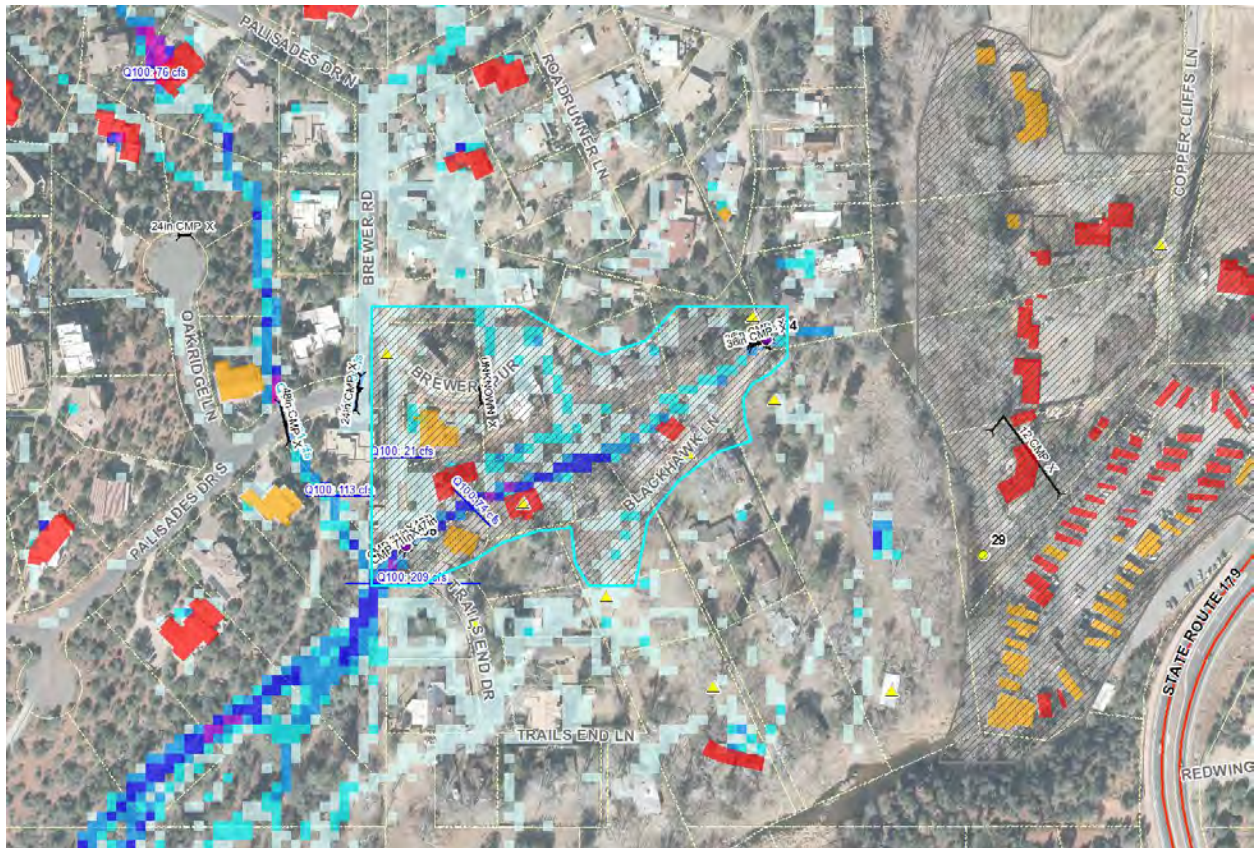
- Storm drain from Rock Ridge Dr. down Saddle Rock. to Rock Ridge Dr. (west)
  - Outfall at wash system
- 95 Forest Circle (APN 408-26-240) possible storage area?
- This was part of the 2005 SWMP
- Consider empty lot downstream of property with large driveway. 60 Forest Circle (APN 408-26-237)
- Pipe storage with metered outflow
- Explore drywell options and geologic exploration (Review ADWR Well logs)
- Existing well near OC Blvd and Birch? 252 Oak Creek Blvd. (408-26-053)
- Rapid infiltration well
  - **\*\*Consider well idea on all hazard areas (Andy)**
- **Rank #5 – HA 12 – Transit Hub**
  - Need further clarification from City of Sedona.
  - This is a FEMA designated floodplain.
  - No schematic plan for transit hub area exists (yet). Planned for next year.
  - City is anticipating crossing for access from 89A.
  - City planning roundabout a hundred or so feet upstream of transit hub on 89A.
  - Take entire flow underground? Rob suggested we provide a very conceptual storm drain size/concept and:
  - Determine channel capacity and culvert sizes alternative
- **Rank #6 – HA 2 – Doodle Bug**
  - Storm drain from SR 179 to Oak Creek
  - Channelize along 179 from Pine Dr. area all the way to Juniper/Access and then storm drain down Doodle Bug to Oak Creek
  - This is a FEMA designated floodplain.
  - ADOT may be open to channelization and crossing at Access/Doodlebug
    - Storm drain to OC
  - Replace pipe through parking lot adjacent to tennis courts
    - Improve channel downstream of tennis courts to convey diversion
  - Split system down Juniper Tr from SR 179
  - Completely bypass community and outfall along Oak Creek Cliffs Drive? This option would require cooperation of ADOT, USFS, Oak Creek HOA, and possibly other property owners.
  - Replace wash with storm drain. Harmony-Windsong-like project.
- **Rank #7 – HA 35 – Arroyo Dr. & Arroyo Pinon Dr.**
  - 60" cmp inlet on Dry Creek appears to be in wrong place. David Peck provided accurate information for this inlet with photos on 4/9/21 (upstream end of 20 Stetson Court, 408-48-130F).
    - Go upstream a few hundred feet (curved wall) could be headwall? Yes.
    - David to go locate and measure structure inlet (Done – 4/9/21)
  - Detention at upstream end? Storage in Pipe?
  - Add storage near crossing at Gunsmoke Ln.
  - Channel improvements south of 89A along Arroyo / Sedona Real Inn Hotel
  - Sedona Real just sold.

- City to provide easement and sewer line database to JEF.
- 10 Pinon Drive (408-11-086A, 2.25 acres) recently fully developed as an apartment complex and provided onsite retention/detention for the development.
- Shared use path north of El Camino Grande south of new apartment complex
- Storm drain down Arroyo Pinon?
  - Take some burden off of existing corridor
- Lack of drainage complaints for area
- Put pipe underneath shared use trail from west to east for 100yr flow (~100 cfs)
- ~~Rank #9 – HA 36 – Soldier Wash & Brewer Rd~~
  - ~~Need further clarification from City of Sedona.~~
  - ~~Project has already been built, remove from list. Add next project to top 12.~~
  - ~~Will be expanded for future intersection improvements~~
  - ~~Removed (this project is complete)~~
- Rank #8 – HA 4 – 89A and Southwest Dr
  - Empty area on HOA land upstream of Cardinal Ln
  - Tap into Harmony-Windsong w/ inflow from Cardinal Ln
  - Storm drain inlet at Cardinal/Sinagua (large pipe and inlet already present)
    - Outlets into open channels of dual 78" pipes
    - Need to add pipe to database and model
  - City wants to remove existing trash rack. Constantly becomes inundated with debris.
  - Consider sediment basin on open parcel upstream to the northwest of existing inlet
  - JEF to investigate Survey response ID 537 (Anne Cunningham) wrong location?
  - See three existing inlets at 89A and Southwest Dr. These inlets clog, and water makes it into intersection and ponds. Perhaps developer of these open parcels can address.
- Rank #9 – HA 33 – Oak Creek Blvd. & Panorama Blvd.



- Install storm drainpipe in Panorama Blvd, route north via Oak Creek Blvd or Inspiration Dr.
- Install small interceptor channel along Panorama Blvd, route north via Oak Creek Blvd or Inspiration Dr. and add driveway culverts.
- There's no place to daylight both of these systems so would just add retention for smaller storms.
- **Rank #10 – HA 31 – Sunshine Ln. & Homestead Rd.**
  - TBD
  - **City is in favor of either improving existing channel or taking some or all of the flow into a storm drain.**
  - **See Andante recommendations.**
- **Rank #11 – HA 16 – Brewer Spur & Trails End Dr.**





- Trails End New Culvert
- Increase Oak Creek Breakout Channel Capacity
- Some storage opportunities. Most will require land acquisition.
- This is a FEMA designated floodplain.
- **Rank #12 – HA 7 – Northview Rd & Ross Rd**
  - Storage opportunity at APN 408-26-213A
  - Mission Rd – San Juan Circ.
    - Storage area?
  - City land at Posse Ground & San Patricio.
    - Large area available for storage?
  - Improvements to N-S channel (would need to acquire drainage easements)
  - Storm drain to capture flows from northeast tributary.
  - Expand/improve channel from Birch Blvd. to Northview Rd
  - Storm drain and catch basin system from Saddle Rock to North View on 89A and improve channel downstream end of 84” culvert at Northview.
  - The west Northview Road roadside ditch from the north side of Ross Road to Sierra Road has always been problematic and should be improved. Jack Seeley of 190 Northview Road has complained about breakout from the Ross Road culvert entering his property for years.
  - Andy – “Drainage improvements in this area not a high priority”. Minimal complaints from residents.
  - Rank lower in top 12 list.