UNDERGROUND STORAGE SUPPLEMENT
TO APPLICATION TO APPROPRIATE WATER BY PERMIT

1. State amount of water to be diverted to underground storage from each point of diversion in item 3b of form APP.

   a. Maximum Rate of diversions (1) 20 (2) 20 (3) 0.2 cfs
   b. Maximum Annual Amount (1) 7,128 (2) 7,128 (3) 55 acre-feet

2. Describe any works used to divert to off-stream spreading grounds or injection wells not identified in item 7 of form APP.
   See primary application.

3. Describe spreading grounds and identify its location and number of acres or location of upstream and downstream limits if onstream.

   Spreading grounds total approximately 538 acres of infiltration/percolation areas, which include the existing percolation ponds totaling 34 acres owned by the City of Huron, and existing agricultural fields totaling about 504 acres. The agricultural fields are planted with annual field crops when there is available water supply. When surface water is available from the Arroyo Pasajero for diversion, the fields will be used for infiltration of diverted water.

4. State depth of groundwater table in spreading grounds or immediate vicinity:
   196.6 feet below ground surface on 12/29/2016 measured at a point located within the NW 1/4 of NW 1/4 of Section 19, T 20S, R 18E, MDB&M, as reported in the DWR Water Data Library (location shown in Figure 10.4.1 and groundwater levels are shown in Figures 10.4.2 and 10.4.3), retrieved May 8, 2017 from
   http://www.water.ca.gov/waterdatalibrary/groundwater/hydrographs/bm_hydro.cfm?CFGRIDKEY=19979

California Environmental Protection Agency

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Figure 10.4.1 - Well Information

Groundwater Levels for Well 20S18E19D003M

All elevation and depth measurements are in feet. The vertical datum for historical measurements is NAVD29.

Figure 10.4.2 - 1995 to 2008 groundwater level information

California Environmental Protection Agency
5. Give any historic maximum and or minimum depths to the groundwater table in the area.

Location ______ Maximum ______ feet below ground surface on ______ (date)
Location ______ Maximum ______ feet below ground surface on ______ (date)

The 1957 publication Ground-Water Conditions in the Mendota-Huron Area Fresno and Kings Counties, California (see Section 8 below) indicates that generalized groundwater levels in the area of the Place of Use were about 100 to 200 feet below the ground surface in the Spring of 1952 (Plate 7).

6. Describe proposed spreading operation.
Temporary pumps at the points of diversion will discharge to the spreading basins through ground level aluminum pipe. Pumps will be throttled (if needed) to match the infiltration/recharge rate of the spreading grounds after the initial filling. For the agricultural lands, the recharge or percolation rate is estimated to be about 0.148 feet/day based on a weighted average of the
rates and days infiltration occurred when no filling was happening, from the adjoining Westside Detention Basin in 2001, 2010 and 2011 (see Figures 10.6.1, 10.6.2, 10.6.3 and 10.6.4 below). Rates at the basin varied from about 0.10 to 0.27 feet/day for the four periods notes. The weighted average is shown in Table 10.6.1. The rate for the City of Huron ponds is less at about 0.009 feet/day. Therefore, for a 504 acre agricultural spreading grounds (minus any small amounts of evaporation) infiltration of about 13,458 acre-feet will occur over an 180 day period, with about 55 acre-feet for the existing City of Huron ponds for the same 180 period over about 34 acres. The rate of infiltration is less than the capacity of the pumps at the point of diversion and therefore the limiting factor will be the estimated infiltration or percolation rate and the appropriation requested is up to the percolation rate of the infiltration area, estimated to be 13,513 acre-feet per year.

![Infiltration Curve at Westside Detention Basin, March 2001](image)

**Figure 10.6.1 – Infiltration Curve at Westside Detention Basin, March 2001**
Figure 10.6.2 – Infiltration Curve at Westside Detention Basin, April 2001
Figure 10.6.3 – Infiltration Curve at Westside Detention Basin, March 2010

Figure 10.6.4 – Infiltration Curve at Westside Detention Basin, April 2011
Table 10.6.1 – Weighted Average of Gale Avenue Infiltration Rates

<table>
<thead>
<tr>
<th>rate ft/day</th>
<th>days</th>
<th>weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar-01</td>
<td>0.1875</td>
<td>16</td>
</tr>
<tr>
<td>Apr-01</td>
<td>0.1000</td>
<td>14</td>
</tr>
<tr>
<td>Mar-10</td>
<td>0.2670</td>
<td>7</td>
</tr>
<tr>
<td>Apr-11</td>
<td>0.1050</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>8.159</td>
</tr>
</tbody>
</table>

7. Describe location, capacity and features of proposed pretreatment facilities and/or injected wells.
None

8. Reference any available engineering reports, studies, or data on the aquifer involved.

9. Describe underground reservoir and attach a map or sketch of its location.
The PODs, percolation area, Place of Use and recovery wells are all within the Westside Subbasin (subbasin 5-22.09) as defined in Department of Water Resources Bulletin 118, the boundary of which is shown on the map included as Attachment 12. The subbasin covers about 1,000 square miles (640,000 acres) and consists mainly of the lands in Westlands Water District.
The aquifer system of the Westside Subbasin consists of unconsolidated continental deposits of Tertiary and Quaternary age. These deposits form an unconfined to semi-confined upper aquifer and confined lower aquifer in most of the subbasin, and these aquifers are separated by an aquitard named the Corcoran Clay or E-clay (DWR, 2003). The project area consists of low alluvial plains and fans (Plate 1, USGS, 1964) and is defined as young alluvial-fan and basin-rim soils, permeable to moderately permeable (Plate 3, USGS, 1964).
Most of the project area is not underlain by the Corcoran Clay, which is only present in the area northeast of Huron (Schmidt, 2014). DWR indicates that the Corcoran Clay does not extend to...
the westerly boundary of the Coast Range alluvium at Los Gatos Creek (pg. 26, 2002), but ends at about the San Luis Canal/California Aqueduct (Figure 5, DWR, 2002). Water moves from the unconfined and semi-confined zones in the lower zone in areas on the west side of the basin where extensive confining layers do not appear to be present (pg. 26, DWR, 2002). Pictorially, this is shown in Figure 10.9.1 below, a generalized hydrogeological cross section (Figure 4, WWD, 2008). Therefore, percolation of diverted waters will be into both portions of the aquifer, and be able to be recovered from the aquifer by nearby wells.

![Figure 10.9.1 – Generalized Hydrogeological cross section](image)

10. State estimated storage capacity of underground reservoir.
Available storage is estimated to be about 65,000,000 acre-feet in the lower aquifer and 36,500,000 acre-feet in the upper aquifer (DWR, 2003).

11. Describe existing use of the underground storage reservoir and any proposed change in its use.
The existing aquifer is used for agriculture and municipal groundwater supply, and experiences recharge from local streams and rainfall. No change in the use of the underground storage reservoir will occur with the project.

12. Describe the proposed method and location of measurement of water placed into and withdrawn from underground storage.
Water placed into storage will be measured at the Point of Diversions by flow meters on the discharge sides of the booster pumps. Water withdrawn from underground storage will be measured by flowmeter placed on the 16 well discharges, at the recovery well locations shown on Attachment 12. The City of Huron municipal well is estimated to operate at about 2.3 cfs, and agricultural recovery wells operate at about 3 cfs each. The agricultural demand is equivalent to as much as 89.1 acre-feet per day, or 18,711 acre-feet per year for a 7 month irrigation season for as many as 15 wells that can be used in the area. Therefore, in those years when the water in the Westside Detention Basin is available and has been diverted and infiltrated, the existing wells can recover the stored water sooner than a complete irrigation season.