Rainwater Irrigation and Storage Calculations

PLN: 13374,13337,13367,13336,13356,&13365

Over view:

Water for cannabis irrigation and the operations buildings will be supplied entirely by an integrated rainwater catchment system. The system will utilize three rainwater catch ponds and 7 separate tank locations to distribute rainwater to PLN: 13374,13337,13367,13336,13356,&13365.

The combination of rainwater sources will provide over 2,526,197 gallons of water in very low rainfall years, plenty to meet the 1,904,202 gallon projected irrigation and domestic need, including consideration for evaporation from the pond. The breakdown of water catchment, water use, and water storage numbers are provided below.

Although the 50 year average for annual rainfall is 66.68", the rainfall volumes below are calculated using the average precipitation value in the ten lowest rain years (40.105").

^{*}See rainfall data Page 4

^{*}See water distribution system Page 3

Calculations

Volumes by source:

Pond #1 APN 218-051-008 PLN: 13374 potential volume of water availability calculated using low average rainfall. 74,479sf x 40.105" x 0.6234= 1,862,084gallons

Pond #2 APN 218-190-001 PLN: 13365 potential volume of water availability calculated using low average rainfall. 15,981sf x 40.105" x 0.6234= 399,548gallons

Pond #3 APN 218-071-003 PLN: 13336 potential volume of water availability calculated using low average rainfall. 10,582sf x 40.105" x 0.6234= 264,565gallons

*Note: although the 50 average for annual rainfall is 66.68", the rainfall volume above is calculated using the average precipitation value for the ten lowest rain years in the available data set (40.105")

Total water volume available in low rainfall years: 2,526,197gallons

Estimated water use:

PLN#: 13374=276,840 PLN#: 13337=386,812 PLN#: 13367=140,000 PLN#: 13336=456,200 PLN#: 13365=530,300 PLN#: 13356=114,050 =1,904,202

Evaporation Loss:

Willow creek 1 NW Monthly Pan evaporation (inches)

Period of record Jan Feb Mar Apr May Jun Jul Aug Sep oct Nov Dec Total

WILLOW CREEK 1 NW | 1968-2005 | 0.58 1.35 1.81 2.74 4.73 6.50 7.53 6.05 3.79 1.94 0.75 0.92 38.69

*multiply by .7 correction factor for offset heat exchange

Pond surface area (Median): (P#1-4,356)+(P#2-1,525)+(P#3-12,851) = 18,731

Class A Pan seasonal evaporation rate-37 year average: 38.69' Corrected Pan evaporation: 38.69x.7= 27.083'/12= 2.257ft

median surface area x corrected pan evaporation rate 18,731sf.x2.257ft=42,275.867cf. x7.48052gallon conversion = 316,245gallons

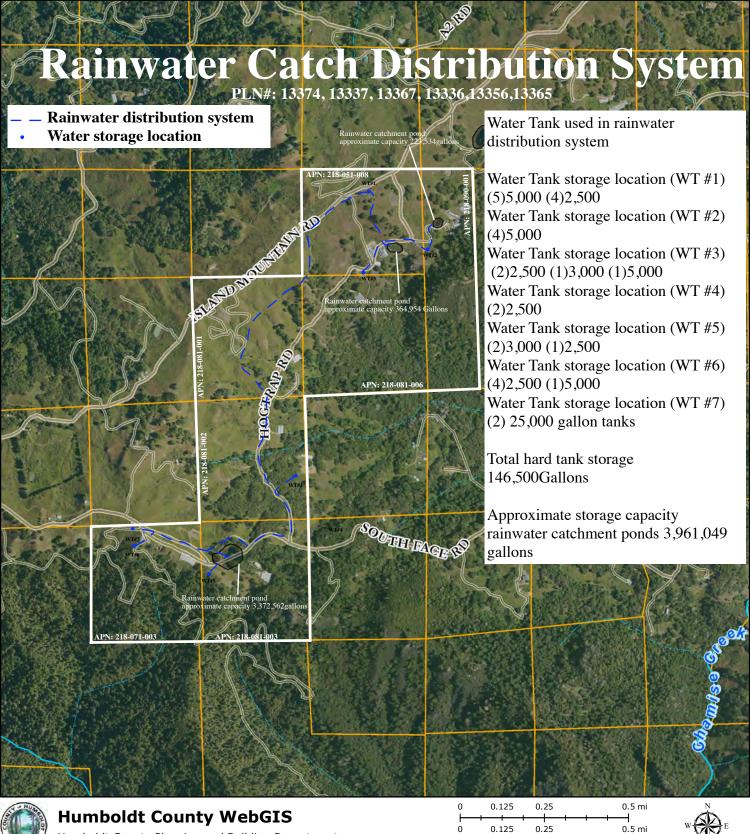
Annual water need: (=1,904,202 use) + (316,245 evap-loss) = Gallon 2,220,447

Total water volume available in low rainfall years: 2,526,197gallons

Sources:

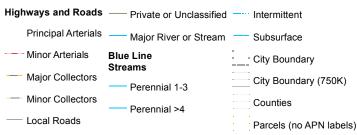
Rainfall records: https://prism.oregonstate.edu/explorer/

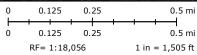
Evaporation Loss: https://wrcc.dri.edu/Climate/comp table show.php?stype=pan evap avg





Humboldt County Planning and Building Department







8/2/2024, 9:29:19 AM

Web AppBuilder 2.0 for ArcGIS

Map Disclaimer:

While every effort has been made to assure the accuracy of this information, it should be understood that it does not have the force & effect of law, rule, or regulation. Should any difference or error occur, the law will take precedence.

Source: Humboldt County GIS, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, NAIP

	Table 1		
Climate variable: ppt Spatial resolution: Akm Spatial resolution: Akm Spatial resolution: Akm Spatial resolution: Akm Spatial resolution: Off Spatial resolution	PRISM Time Series Data		
Spatial resolution: 4km Image: 1707 - 2020 Im	Location: Lat: 40.0366 Lon: -123.5964 Elev: 1762ft		
Period: 1970 - 2020 Dataset: AN91m	Climate variable: ppt		
Dataset: AN91m	Spatial resolution: 4km		
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Time series generated: 2024-Jul-25 Details: http://www.prism.oregonstate.edu/documents/PRISM_datasests.pdf Date	PRISM day definition: 24 hours ending at 1200 UTC on the day shown		
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Average			34.03
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