

Comment Report

81-7152

1. mweaver 3/3/2008 Final Draft License

Comment: I reviewed the BUFR and prepared the final draft license.

2. mweaver 3/6/2008 Permit Ammendment

Comment: I prepared the Application for Amendment for this permit. In the application we have changed uses from "Irrigation", "Irrigation Storage" and "Irrigation From Storage" to "Recreation", "Recreation Storage", and "Power". We also added the use of "Stockwater Storage". Prior to issuing the Application for Amendment I reviewed volumes associated with each use to make sure there was no enlargement.

In calculating a volume associated with the Power use I assumed an average flow of 0.075 CFS (avg. between high and low flows, it is noted in the BUFR that there has always been a minimum flow of 0.03 CFS) over a duration of 6 months. This duration was based on the assumption that power will only be generated for half the year, for the other half of the year winter or "low flow" conditions will prevent the "microturbines" from generating power.

In calculating the volume associated with the Recreation use I assumed an average flow of 0.075 CFS over the entire year.

All of my calculations can be found in the water right file.

3. SCURTIS 1/3/1995 Proof of Beneficial Use Rcvd

Comment: Proof of Beneficial Use Rcvd

81-715Z: RECREATION

RECREATION STORAGE

POND AREA = 0.575 (SHAPE DRAWN FROM NAIP 2004 AERIAL)
AVG. DEPTH OF POND = 6.4' (FROM BUFFER CALC'S 16' (0.4'))

$$V = (0.575 \text{ AC})(6.4 \text{ FT}) = 3.7 \text{ AC-FT}$$

Q = DOES NOT APPLY

RECREATION (LINE FLOW): $Q = 0.12 \text{ CFS} \sim 0.03 \text{ CFS}$
 $\bar{Q} = 0.075 \text{ CFS}$
 $T = 365 \text{ DAYS}$

$$V = \left(0.075 \frac{\text{FT}^3}{\text{S}}\right) \left(\frac{86400 \text{ S}}{1044}\right) (365 \text{ DAYS}) \left(\frac{1 \text{ AC}}{43560 \text{ FT}^2}\right)$$

$$= 54.29 \text{ AC-FT}$$

$$Q = 0.12 \text{ CFS}$$

TIME TO FILL CHECK

$$Q_{\text{BUFFER}} = \left(\frac{4 \text{ GAL}}{18 \text{ S}}\right) \left(\frac{1 \text{ FT}^3}{7.48 \text{ GAL}}\right) = 0.03 \text{ CFS @ } \frac{1}{4} \text{ CAPACITY}$$

$$Q_{\text{BUFFER}} = 4(0.03 \text{ CFS}) = 0.12 \text{ CFS}$$

$$\text{Time} = T = \frac{V_{\text{POND}}}{Q_{\text{BUFFER}}} = \frac{(3.7 \text{ AC-FT}) \left(\left(\frac{43560 \text{ FT}^2}{1 \text{ AC}}\right)\right)}{\left(0.12 \frac{\text{FT}^3}{\text{S}}\right) \left(\frac{86400 \text{ S}}{1044}\right)} = \underline{\underline{15.5 \text{ DAYS}}}$$

∴ STORAGE REQ'D

81-7152 - STOCKWATER

24 HEAD OF CATTLE

Q From A.P. MEMO #3 For 24 HEAD Q = 0.02 CFS

V From A.P. MEMO #3 For 24 HEAD V = 1.0 AC-FT

24 FROM PERMIT OR

$$= (.24 \text{ COWS}) (12 \frac{\text{GAL}}{\text{COW}}) (365 \frac{\text{DAY}}{\text{YR}}) \left(\frac{1 \text{ FT}^3}{7.48 \text{ GAL}} \right) \left(\frac{1 \text{ AC}}{43560 \text{ FT}^2} \right)$$

STOCKWATER: 0.32 AC-FT

STOCKWATER STORAGE: STOCK TANK $\approx (500 \text{ GAL}) \left(\frac{1 \text{ FT}^3}{7.48} \right) \left(\frac{1 \text{ AC}}{43560} \right) = 0.002 \text{ AC-FT}$

$$V = 0.002 \text{ AC-FT}$$
$$\approx 0.1$$

Q = DOES NOT APPLY

POWER

MICROHYDRO UNITS / RESEARCHERS REQUIRE HIGH HEAD LOW FLOW OR LOW HEAD HIGH FLOW

Assuming 100' HEAD Q $\approx 4 \text{ GPM}$

FOR HEADS IN THE 5-10' RANGE Q $\approx 1-2 \text{ CFS}$

$\therefore$ 1 LOW RECOMMENDED Q POWER = 0.12 CFS

V Assume Avg. Q = $\frac{0.12 + 0.03}{2} = 0.075 = 0.08 \text{ CFS}$

$$V = (0.08 \frac{\text{FT}^3}{\text{S}}) \left(\frac{86,400 \text{ S}}{1 \text{ DAY}} \right) \left(\frac{1 \text{ AC}}{43,560 \text{ FT}^2} \right) (183 \text{ DAYS}^*) = 29 \text{ AC-FT}$$

* ASSUMING POWER GENERATION
IS ONLY POSSIBLE 6 MONTHS
A YEAR

81-7152: ENLARGEMENT CHECK

TOTAL ∇ UNDER PERMIT

$$\text{STOCK: } (24 \text{ HEAD}) (12 \text{ GPD/HEAD}) (365 \text{ DAY}) \left(\frac{1 \text{ CF}}{7.48 \text{ GAL}} \right) \left(\frac{1 \text{ AC}}{43,560 \text{ SF}} \right) \\ = 0.32 \text{ AC-FT}$$

$$\text{IRR. STORAGE: } 2 \text{ AC-FT}$$

$$\text{IRR. FROM STORAGE: } 2 \text{ AC-FT}$$

$$\text{IRRIGATION: } V_{DR} = (1.30 \frac{\text{FT}^3}{\text{S}}) (214 \text{ DAYS}) \left(\frac{86400 \text{ S}}{1 \text{ DAY}} \right) \left(\frac{1 \text{ AC}}{43,560 \text{ FT}^2} \right) = 551.8 \text{ AC-FT}$$

OR

$$V_{IR} = (65 \text{ AC}) (3.0) = 195 \text{ AC-FT}$$

$$\nabla_{IRR} = \text{SMALLER OF } \nabla_{DR} \text{ OR } \nabla_{IR} \therefore \nabla_{IRR} = 195 \text{ AC-FT}$$

$$\nabla_{\text{TOTAL}} = 0.3 + 2 + 2 + 195 = \underline{\underline{199.3 \text{ AC-FT}}}$$

TOTAL ∇ UNDER LICENSE

$$\nabla_{\text{TOTAL}} = \text{REC. STORAGE} + \text{REC. LIVE FLOW} + \text{STOCKWATER} + \text{STOCKWATER STORAGE + POWER}$$

$$= 3.7 \text{ AC-FT} + 54.29 \text{ AC-FT} + 0.32 + 0.001 + 29$$

$$= 87.3 \text{ AC-FT}$$

$$\underline{\underline{87.3 < 199.3 \therefore \text{OK} !!}}$$

