Formulas, Weights and Measures used in Pumping

This page of formulas, weights and measures may come in handy for you when you are trying to calculate or figure the items of importance in the pumping industry. If you have any questions about them, please don't hesitate to call.

Acres in a Parcel of Land

Section = 640 Acres
- Irrigated Acres in Section Pivot = **502.65 Acres** (Rounded to 502)
- Non-irrigated Corners = 34.34 Acres x 4 = 137.36 Acres (Rounded to 34 Acres per corner)

½ Section = **320 Acres**
- Irrigated Acres in ½ Section Pivot = 251.32 Acres (Rounded to 251)
- Non-irrigated Corners = 34.34 Acres x 2 = 68.68 Acres (Rounded to 34 Acres per corner)

¼ Section = **160 Acres**
- Irrigated Acres in ¼ section = 120 Acres
- Non-irrigated Corners = 10 Acres x 4 = 40 Acres

Acres in odd size parcel = (length in feet x width in feet) / 43,560
Acres in odd size pivot = ((length of pivot x length of pivot) x 3.14159) / 43,560
Acres in odd size pivot = Radius squared x Pi (3.14159) / 43,560

Square feet in Acre of Land = 43,560 square feet
1 Square Acre = 208.71 feet length x 208.71 feet wide

Measurements of Distance

When considering distance from Lagoon to the field it is always determined by the "hose distance" as this is the distance the effluent must travel. This is always longer than the distance the crow flies as the hose must go through culverts, go around obstacles and areas we don't have permission to cross as well as it must traverse the field without overlapping itself.

Feet in a Mile = 5,280 Feet (8 Hoses)
Feet in ½ Mile = 2640 Feet (4 Hoses)
Feet in ¼ Mile = 1320 Feet (2 Hoses)
Feet in 1/8 Mile = 660 Feet

Diagonal of Section = 7,467 Feet
Diagonal of ¼ Section = 3,733 Feet
Diagonal of 40 Acres = 1,866 Feet

Measurements of Water

Acre Inch of Water = 27,154 Gallons
Acre Foot of Water = 325,851 Gallons
Weight of Gallon of Fresh Water = 8.345 Pounds
Weight of a Gallon of Effluent = (varies by % of solids it contains) Average used in calculations = 8.5 Pounds
Gallons in a Cubic Foot of water = 7.48 or rounded in calculations to 7.5 gallons
Pounds in a Cubic Foot of water = 62.42 pounds in ft^3 of fresh water; 63.58 pounds in ft^3 of average effluent

Gallons of Water in a Lagoon

Gallons in Lagoon = Average Square feet of Lagoon x Water Depth x 7.5
See separate article for calculations

Calculate Dry Tons of Manure in an Effluent

This formula is not needed in an agriculture environment. However it is useful in commercial applications and for commercial and industrial pumping of lagoons.

(Length of lagoon x Width of lagoon x Depth of lagoon) = Cubic feet x 7.5 gallons/cf = Total gallons
Gallons x 8.5 pounds/gal = Pounds of Effluent x Percentage of solids in effluent = Pounds of dry solids
Pounds / 2000 pounds/ton = Total Dry tons