Irrigation Energy Self Assessment Data Collection Forms

Name of Irrigation system:_____

Type of Irrigation System?

__ Center Pivot Sprinkler
__ Linear Move Sprinkler
__ Solid Set Sprinkler
__ Traveling Gun
__ Hand Move Sprinkler
__ Side-Roll / Wheel-Move System
__ Micro/Drip Irrigation
__ Furrow Irrigation
__ Flood Irrigation

Energy Source for Pumping (Choose one)		Energy Cost per unit
__ Electricity		_____ $/kWh
__ Diesel		_____ $/gal
__ Gasoline		_____ $/gal
__ LP Gas		_____ $/gal
__ Natural Gas	(1 decatherm = 10 therms)	_____ $/Therm or CCF

Type of drive unit? __ Direct Drive __ V-belt __ Right angle gear box

Type of Pump? (Choose one)

__ Centrifugal, self-priming, 40 psi or more
__ Centrifugal, self-priming, less than 40 psi
__ Centrifugal, non-self-priming, 40 psi or more
__ Centrifugal, non-self-priming, less than 40 psi
__ Submersible (motor attached to pump submersed in well)
__ Vertical Shaft Turbine (pump in well with drive unit (electric motor or engine) at surface)

Pump Information

Pump Output _____ Gallons per minute (gpm)

Where is your pressure gauge located?

__ At well head __ At Distribution point to laterals __ At Center Pivot Riser

System Pressure at gauge _____ Pounds per square inch (psi)

What is the total lift (vertical distance) to the well head or Pump? _____ feet

(Distance from water surface during pumping to well head or pump)

What is the lift from the Well Head/Pump to the Center Pivot

or Distribution point? _____ Feet

(up hill is a positive number; down hill is a negative number)

Average Annual Total amount of water applied. _____ inches per year

(Use the average amount of water applied per year for the last 5 to 10 years)

Average water application per irrigation event? _____ inches per irrigation event

Application Efficiency (if known) _____%

(Amount of water that falls to the ground is available for plant growth - program default – 85%)

Well and Main Line Piping Sections

	Inlet to ground level[6]	Well head to Point A[7]	Point A to Distribution point[8]
Pipe diameter (inches)[1,2]			
Pipe Material[3]	A S P H	A S P H	A S P H
Length of pipe (feet)			
	Enter number of fittings		
Elbows			
Flow through Tees[4]			
Branch Tees[5]			
Swing check Valve			
Gate valve – open wide			
Foot valve			
Flow meter			
Chemigation Valve			

1) Typical Pipe diameter (inches) –2, 2-1/2, 3, 3-1/2, 4, 5, 5-9/16, 6, 6-5/8, 8, 8-5/8, 10, 12
2) Pipe diameters must remain the same diameter or get smaller in progressive pipe sections for calculations to work correctly.
3) Pipe Materials – A=Aluminum, S=Steel, P=Plastic (ABS or PVC), H= Soft Hose (flexible rubber or plastic)
4) Flow Through Tees – fluid flow maintains the same direction as it enters and exits the Tee fitting.
5) Branch Tees – Fluid flow changes directions as it enters and exits the Tee fitting.
6) Inlet to Ground Level – Piping from the water inlet into the irrigation system to the ground level or pump if pump is located above ground or on the bank of a pond.
7) Point A is an arbitrary point in the piping system between the well head/pump and the Center pivot or distribution point. This allows modeling of systems that have different pipe diameters or materials between the well head/pump and the distribution point.
8) Distribution point – can be the center pivot riser, headland distribution pipe or the end of an open discharge pipe.

Where to go Next

If Center Pivot or Linear-Move sprinkler system – proceed to page 3.

If Solid-Set, Hand-Move or Side-Roll/Wheel-Move sprinkler system – proceed to page 4.

If Traveling gun, furrow, flood, or drip/micro irrigation – proceed to page 4.

Step 3: Sprinkler Irrigation Input

What is the maximum difference in elevation from the center pivot or drive unit of a linear-move system to any point along the span? _____ feet

(Enter lower elevations as a negative number. If spans cover terrain that is higher at one point and lower at another point than the center pivot or drive unit, use the average difference.)

Lateral Span Specifications

	Span(s) "A"[4]			Span(s) "B"[4]			Span(s) "C"[4]			Overhang		
Pipe Diameter (inches)[1,2]												
Pipe Material[3]	A	S	P	A	S	P	A	S	P	A	S	P
Span Length (feet)												
Number of Spans												
Nozzle Spacing (feet)												

1) Typical Pipe diameter (inches) –2, 2-1/2, 3, 3-1/2, 4, 5, 5-9/16, 6, 6-5/8, 8, 8-5/8, 10, 12
2) Pipe diameters must remain the same diameter or get smaller in progressive pipe sections for calculations to work correctly.
3) Pipe Materials – A=Aluminum, S=Steel, P=Plastic (ABS or PVC)
4) Span(s) "A" – A, B, C are arbitrary points on the lateral where the span length, pipe diameter, pipe material, or nozzle spacing changes.

Tower Drive Motor HP (if electric) 1/2 3/4 1.0 1-1/2 2 3 None

If Electric pump is not used

Does engine drive an electrical generator? Yes No

What is the electrical cost? _____ $ / kWh

Degrees of rotation of center pivot _____ (up to 360° - full circle)

Pumping efficiency (leave blank if unknown) _____%

Is End Gun used? Yes No

If "YES" - What is the percentage of the rotation the end gun is on? _____%

(If pivot rotates 200 degrees and end gun is on for 100 degrees then 100/200 = 50%)

End Gun Booster pump HP (if used) _____

(Normally used on lower pressure systems)

Solid-Set / Hand-Move / Side-Roll Sprinkler

Number of Lateral Branch lines _____

Pipe Diameter of Laterals (inch)

2 2-1/2 3 3-1/2 4 5 5-9/16 6 6-5/8 8 8-5/8 10 12

Pipe Material: Steel Aluminum Plastic Soft Rubber

Average Length of laterals _____ feet

Number of sprinklers per lateral _____

Elevation difference: distribution point to highest point _____ feet

Pumping Efficiency (if known) _____% (Program uses default value is not known)

Number of Acres irrigated _____

Drip / Micro, Traveling Irrigator (gun), Surface Irrigation (Flood or Furrow)

Increasing pumping efficiency is the only option for reducing energy costs for these types of irrigations systems. Travel gun systems could be replaced with sprinkler type irrigation systems to reduce energy costs.

Pumping Efficiency (if known) _____% (Program uses default value is not known)

Number of Acres irrigated _____