United States Department of Agriculture
Natural Resources Conservation Service

CSP Job Sheet I-1

IRRIGATION ENHANCEMENT **December 2005**

NEBRASKA **Name:** _____

Irrigation Enhancement Index

Payment as follows:
$__.00 / Acre / Year for an irrigation enhancement Index value of 60 – 64%;
$__.00 / Acre / Year for an irrigation enhancement Index value of 65 – 69%;
$__.00 / Acre / Year for an irrigation enhancement Index value of 70 – 74%;
$__.00 / Acre / Year for an irrigation enhancement Index value of 75 – 79%;
$__.00 / Acre / Year for an irrigation enhancement Index value of 80 – 84%;
$__.00 / Acre / Year for an irrigation enhancement Index value of 85% or greater.

Irrigation water management quality criteria must be met for Tier III participation. For the Conservation Security Program (CSP), the minimum requirement for water quantity – irrigation water management on cropland or pastureland is considered achieved when the current level of treatment and management for the system results in a water use efficiency value using CSP Irrigation Enhancement Index Tool of at least 50%.

A producer can improve the irrigation enhancement index value by agreeing to implement various irrigation enhancement actions listed in the Index Tool that will result in higher index rating.

Irrigation Inventory Worksheet

For those irrigated cropland and or pastureland acres you wish to enroll in CSP that are irrigated, please complete one worksheet per type of irrigation system on the following Irrigation Inventory Worksheet. This information will help us with assessing the benchmark condition for these land uses.

For help with definitions and descriptions of the elements within the following 9 categories see pages 4 through 7 below.

1. What type and or types of irrigation systems do you use on your farm or ranch for which this irrigation inventory is being completed? Place an ☒ in the box and or boxes that are applicable to your situation.

☐ Center Pivot (generic)	☐ Furrow – graded furrow
☐ Center Pivot – Low Pressure Improved	☐ Furrow – surge
☐ Center Pivot mid-elevation spray application (MESA)	☐ Micro-irrigation – subsurface drip irrigation (sdi)
☐ Center Pivot low pressure in canopy (LPIC)	☐ Sprinkler – hand line or wheel line or side roll
☐ Center Pivot low elevation spray application (LESA)	☐ Sprinkler – big gun or boom
☐ Lateral Move	☐ Other (please explain)

2. List irrigated tract(s) and/or field(s) numbers and the applicable irrigation system type selected from question #1 above.

Tract No. (s)	Field No. (s)	Irrigation System Type from Question #1 above

3. If your Center Pivot(s) have a Dump Valve list the tract(s) and field(s) numbers next to the appropriate number of corners watered by the dump valve in the table below:

Tract No. (s)	Field No. (s)	Corners watered by Dump Valve
		None (0)
		One (1 corner)1/
		Two (2 corners)1/
		Three (3 corners)1/
		Four (4 corners)1/

1/ Identify / delineate those particular corners on the map provided that are being watered by dump valve

4. How do you measure the amount of water being delivered to your farm or ranch? Place an ☒ next to your selection.

Tract No. (s)	Field No. (s)	
		☐ No flow measuring devices
		☐ Flow measurement-whole farm – manually recorded
		☐ Flow measurement-whole farm – automatic recorded
		☐ Flow measurement-whole farm plus individual field manual recorded
		☐ Flow measurement-whole farm plus individual field automatic recorded
		☐ Other (please explain)

5. How do you schedule irrigation? Place an ☒ in your selection.

Tract No. (s)	Field No. (s)	
		☐ Visual crop stress
		☐ Soil moisture by the NRCS feel method
		☐ Check book scheduling, irrigation scheduler, etc
		☐ Irrigation scheduling via pan evaporation or atmometer for each field
		☐ Soil moisture using Gypsum Blocks, moisture probe, etc
		☐ Continuous measurement of soil moisture, water applied and ET
		☐ Other (please explain)

6. How is the water distribution controlled to your farm or ranch? Place an ☒ in your selection.

Tract No. (s)	Field No. (s)	
		☐ Very poor diversion facilities. Little control of flow rate to farm.
		☐ Can control flow a rate to farm, but the on-farm delivery system is such that it is very hard to deliver the desired flow to any given field.
		☐ Flow rates to each field are adequately controlled. Flow rates to each set are difficult to control.
		☐ All flow rates to each set are adequately controlled (such as that provided by an on-site well).
		☐ Other (please explain)

7. How is the water conveyed to fields? Place an ☒ in your selection.

Tract No. (s)	Field No. (s)	
		☐ Open ditch or canal - sand/gravel
		☐ Open ditch or canal - sandy loam
		☐ Open ditch or canal - clay soil
		☐ Open canal – lined (i.e.: concrete, plastic, synthetic, etc)
		☐ Closed conduit pipeline (includes on-site wells and sprinkler systems)
		☐ Other (please explain)

8. What is the average condition of your gravity irrigated fields with regard to grade and slope, and do you capture tail-water and reuse it?
Place an ☒ in your selection.

Tract No. (s)	Field No. (s)	
		☐ Land smoothed
		☐ Land leveled
		☐ Other (please explain)
		☐ Tail water reuse system installed and used
		☐ Tail water not captured
		☐ Other (please explain)

9. Do you apply pesticides and/or nutrients through your irrigation system?

	Tract No. (s)	Field No. (s)
☐ **Yes**		
☐ **No**		

(Internal Use Only - NRCS will complete the Table below.)

Tract No. (s)	Field No. (s)	Soil Condition Index (SCI)

Documentation Required: Attached copy of CSP Irrigation Enhancement Index.

Certification:

I certify that I have accurately evaluated and implemented the components of my irrigation system as listed on the attached CSP Irrigation Enhancement Index.

Name: _____Date:_____

Limited Descriptions and Definitions

Irrigation System Type: This section represents the system type associated with the field or farm. Some systems are clearly more efficient and easier to manage than other systems. Simply select the system that best describes your system. Local terminology may be slightly different but the system names should be adequate to describe most systems.

Definition of center pivot sprinkler terms and a brief description of each:

LESA - Low Elevation Spray Application

a. Farmed in any row direction
b. Nozzle Height is no more than 18 inches above soil surface
c. Nozzle Spacing is alternate row, up to a maximum of 80 inches
d. All sprinklers include pressure regulators
e. Discharge is through spray nozzles
f. Applicable on crops flat planted, drilled, or planted with furrows or beds
g. Maximum of 3% slope in most of field
h. Furrow Diked or other means of preventing irrigation water movement away from point of application
i. Does not have a dump valve or version there-of

LPIC - Low Pressure in Canopy

a. Farmed in any row direction
b. Nozzle Height is 18 inches to 36 inches above soil surface
c. Nozzle Spacing is alternate row, up to a maximum of 80 inches
d. All sprinklers include pressure regulators
e. Discharge is in the crop canopy
f. Maximum of 3% slope in most of field
g. Systems that utilize bubble nozzles or drag hoses for a portion of the crop year and spray nozzles for a portion of the crop year but do not meet all LEPA criteria should be considered LPIC systems
h. Does not have a dump valve or version there-of

MESA - Mid Elevation Spray Application

a. Farmed in any row direction
b. All sprinklers are positioned on drops
c. Nozzle Height is more than 36 inches high, typically positioned above the mature crop canopy but below the center pivot truss rods
d. All sprinklers include pressure regulators
e. Does not have a dump valve or version there-of

Center Pivot - Low Pressure Improved

a. Farmed in any row direction
b. Sprinklers (either spray pads or impact type sprinklers) are positioned on the center pivot pipe
c. All sprinklers include pressure regulators
d. Impact sprinkler trajectory must be 10 degrees or less
e. Does not have a dump valve or version there-of

Center Pivot (generic)

a. Farmed in any row direction
b. Sprinklers are either impact or spray type
c. Sprinklers are position either on the pipe or on drops

Center Pivot – with a dump valve watering "X" number of field corners

a. Any center pivot type
b. Field corners are supplied water through the dump valve. This includes those with and without pipe connections

Method of Measuring Flow: Water measurement is a critical component of any well planned and managed irrigation system. Knowing how much water is delivered to a farm, field, or irrigation set is critical to making efficient use of water.

- No flow measuring devices - No flow measuring devices are present. The applicant has no way of measuring and recording the amount of water delivered to the farm, to the fields, or to the irrigation set.

- Flow measurement - whole farm, manually recorded - The applicant has a measuring device (calibrated flume or flow meter) that can be used to measure the amount of water that is delivered to the farm. It may be a flow meter on a well that serves one field or a calibrated flume that measures water delivered through a distribution system to the farm. The measurement system does not automatically record the measurement. The applicant must inspect the measurement device and manually record the results in a routine manner and the results used in irrigation planning and scheduling.

- Flow measurement - whole farm, automatic recorded - Flow measurement are taken utilizing the process described immediately above but the measurements are automatically recorded and are used in planning and scheduling irrigations.

- Flow measurement - whole farm plus individual field, manual - The applicant has the ability to measure water that comes to the whole farm as well as to each individual field. The flow measurements are obtained utilizing a measuring device such as a flow meter. In this instance the applicant can measure the water flowing to the farm and to each field. He routinely checks and records the data manually and uses the results to plan and schedule irrigations.

- Flow measurement - whole farm plus individual field, automatic recorded - The applicant has the ability to measure water flowing to the farm and to each field using flow meters or flumes. The results are automatically recorded using a recording device and used for planning and scheduling irrigations.

Method of Scheduling Irrigation

- Visual crop stress - Water management decisions are made from visual indicators related to crop growth. In some instances the crops may be stressed before decisions are made to add needed water.

- Soil moisture by NRCS feel method - Soil moisture is used as the factor to determine when water is to be added using the NRCS feel method. The manager has received some training and has a publication that describes the NRCS feel method. Tools that measure soil moisture throughout the entire crop rooting depth are not used.

- Check book scheduling, irrigation scheduler, etc. - A check book method is used to track and schedule irrigations. Training and fact sheets are available from land grant universities and the results are commonly utilized to manage timing and application of irrigation water.

- Irrigation scheduling via pan evaporation or atmometer for field - Other slightly more sophisticated systems provide reliable methods for scheduling irrigation water applications. Pan evaporation and atmometers are listed here but other devices may be available.

- Irrigation scheduling via regional weather network - An irrigation scheduling system or network that includes weather stations that track climatic conditions and predict irrigation water needs is utilized. These may include on site weather stations or regional weather stations that are operated by commercial or public entities. These networks may be on-line or a group of operators within the watershed area that are moving toward precision water application

- Soil moisture using gypsum blocks, moisture probe, etc. - Methods to track soil moisture including gypsum block, tensiometers, soil moisture probes and other similar tools are used. With calibration these methods become very accurate.

- Continuous measurement of soil moisture, water applied and ET - This combines all methods soil Climate and Checkbook to perform Precision application

Ability to Control Water Distribution: This management enhancement recognizes the ability of the irrigator to manage, direct and control the water flow stream on to the farm, across the farm to one or more fields, and to multiple irrigation sets that may be on the farm or field.

- Very poor diversion facilities, little control of flow rate to farm

- Can control flow rates to farm, but the on farm delivery system is such that it is very hard to deliver the desired flow to any given field

- Flow rates to each field are adequately controlled. Flow rates to each set are difficult to control

- All flow rates to each set are adequately controlled – Should be selected for Center Pivots and other pumped and piped distribution systems

Water Conveyance: Water movement across the farm is a critical component. Losses occur from evaporation and deep percolation within the ditch. Sandy soils have more potential for water losses than clay soils. Lined ditches and canals have evaporation losses but limited deep percolation losses. Closed conduits are the most efficient water delivery systems.

- Open ditch or canal, sand/gravel - Ditches and canals may involve a combination of soils with part of the conveyance in sandy soils and part in clay soils. Select the factor that is predominant

- Open ditch or canal, sandy loam - Ditches and canals may involve a combination of soils with part of the conveyance in sandy soils and part in clay soils. Select the factor that is predominant

- Open ditch or canal, clay soil - Ditches and canals may involve a combination of soils with part of the conveyance in sandy soils and part in clay soils. Select the factor that is predominant

- Open canal, lined – Concrete, plastic, or other impervious materials

- Closed conduit pipeline – Plastic, concrete, or other pipeline materials

Precision of Land Slope: Precision leveled fields have higher efficiency potential and are easier to manage that less controlled grades and slopes. This enhancement category recognizes this factor.

- Land Smooth – This represents land that has been smooth. Highs and lows have been manipulated to provide a more uniform flow of water but not to level of precision associated with a professionally leveled field.

- Land leveled - Land that has been leveled by means of conventional survey and construction equipment.

Tail water Capture and Reuse: A planned system to collect, store, and transport irrigation tail water for reuse. This system is used to conserve irrigation water supplies and improve water quality through capture and reuse of the water that runs off the field This system normally includes a combination of practices and appurtenances that collect, convey, store, and recycle irrigation runoff water for re-use. Common components include pickup ditches, sumps, pits, pumps, and pipelines. Sprinkler type irrigation systems should choose “none” for Tail water Capture and Reuse.