U. S. Army Corps of Engineers
Oil Water Separation
Checklist

Installation Name	_____
Site Name / I.D.	_____
Evaluation Team	_____
Site Visit Date	_____

This checklist is designed to facilitate the performance of an oil-water treatment system used to separate oils and greases from wastewater streams. It is divided into the following sections:

1) Evaluation Team Composition
2) Typical Treatment Objectives
3) References
4) Data Collection Requirements
5) Performance Analysis
6) Evaluation of Operations and Maintenance
7) Typical Performance Problems
8) Alternatives for Possible Cost Savings
9) Supplemental Notes and Data

This checklist provides suggestions for information gathering and space has been allowed to record data and notes from the site visit. Supplementary notes, if required, should be numbered to correspond to the appropriate checklist sections.

1) Evaluation Team Composition

The following disciplines should be included in the evaluation team for the oil-water separation treatment system.

X Process Engineer (site visit, treatment system evaluation)
X Cost Engineer (cost of alternatives)

2) Typical Treatment Objectives

Oil-water separators are designed to one specific group of contaminants: petroleum compounds and grease. However, separators will also remove settleable solids and floatable debris. Two general types of oil-water separators are commonly used: conventional gravity separator and coalescing plate interceptor.

Verify that the treatment objectives established when the oil-water separation system was designed and installed are clear and remain valid. Document any changes in the influent stream which would render the original treatment equipment obsolete or invalid.

_____

_____

3) References

Note the existence of any pertinent operations and maintenance manuals.

Engineering Technical Letter (ETL) 1110-3-466, ASelection and Design of Oil/Water Separators at Army Facilities.

American Petroleum Institute (API), 1990, ADesign and Operation of Oil-Water Separators≅, Publication 421.

Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Headquarters, Department of the Army, Washington DC, 1997.

Technical Manual (TM) 5-811-7, Electrical Design, Cathodic Protection, Headquarters, Department of the Army, Washington DC, 22 April 1985.

4) Data Collection Requirements

a) Record the nameplate information from the oil-water separator for future reference.

_____

_____

b) Sketch the process flow diagram (PFD), including valves and instrument locations on the back of this sheet or on a separate sheet.

c) In order to justify the use of an oil-water separation system as well as designing a proper separator system, the following data should have been obtained during the design process. Note: Some of the data is not easily measured and can be ever-changing, however, best engineering judgement should have used to obtain these values.

Operating Parameters:

Intermittent Flow_____
Continuous Flow_____
Effluent Requirements_____
NPDES Permit or Pretreatment Standard_____
Above or Below Ground Installation_____

Flow Conditions:

Gravity or Pumped Flow _____
Total Separator Storage _____
Maximum Flow Rate (gpm) _____
Average Flow Rate (gpm) _____
Minimum Flow Rate (gpm) _____

Waste Stream Characteristics:

Wastewater Temperature _____
Wastewater Viscosity _____
Specific Gravity of Wastewater _____
pH of Wastewater _____

Contaminants:

Settleable Solids (concentration and type) _____
Detergents _____
Chemical Emulsions _____
Physical Emulsions _____
Suspended Solids _____
Other Contaminants Affecting Operation _____
Volatiles (air pollution or explosion hazard)_____

Product-Oil:

Type _____
Specific Gravity_____
% of Oil to Water_____
% of Oil which is Emulsified_____
% of Oil which is Dissolved_____
% of Oil which is Free_____
Size of Oil Droplet to be Removed_____

Separator:

Volume Provided for Separated Oil_____
Volume Provided for Settleable Solids_____
Volume Provided for Flow Through Detention Time for Adequate Separation_____

Accessories:

Oil Pumps _____
Sludge Pumps_____
Water Pumps_____
Level Controls_____

5) Performance Analysis

a) If an oil coalescing interceptor is being used, ensure that an adequate number of plates are being utilized in order to provide the minimum required total surface area. Note the total surface area provided.

_____
_____

b) If vertical tubes are provided, ensure that the minimum area of vertical tubes exist. Note the total surface area provided.

_____
_____

c) Verify that the effluent is being sampled and analyzed in accordance with the sampling and analysis plan designed to assess the performance of the system. Ensure that proper sampling documentation exists that clearly demonstrates that the oil-water separation system is meeting effluent requirements. If a NPDES permit is required for effluent discharge, ensure that the permit is up-to-date.

_____
_____
_____

d) Can process changes be made to reduce the volume of oil going to the oil water separator or eliminate the need for the unit?

_____
_____
_____

6) Evaluation of Operations and Maintenance

a) Verify that all equipment is maintained per manufacturers recommendations. Compare actual maintenance activities being conducted with recommended activities. Note any variations below.

_____
_____
_____

b) Check all tanks for corrosion, punctures, or excessive wear. Note any deficiencies below.

_____
_____

c) Is the system monitored to assure proper cathodic protection?

_____
_____

d) Verify instruments, controls, and alarms are working. Note any deficiencies below. Are there provisions to notify the operator or owner of malfunctions?

_____
_____
_____

e) Check to ensure that the separator has adequate capacity for settleable solids.

_____
_____

f) Are the sludges and solids removed from the oil-water separator being properly characterized and disposed of? What methods are being used?

_____
_____

g) If a high water table exists at the site is proper anchoring of the tanks being provided.

_____
_____

h) Check to ensure that the oil separator has adequate oil storage capacity.

_____
_____

i) Verify that the collected oil is removed from the oil-water separator before it accumulates and overflows into the discharge stream or overflows the collection tank.

_____
_____

j) Is the oil removed from the oil storage being properly characterized and disposed of? What methods are being used?

_____

_____

7) Typical Performance Problems

Experience has shown that common deficiencies have occurred primarily as a result of the following: (1) inadequate design, (2) misapplication of commercially available, pre-manufactured separators, (3) failure to adequately understand the character of the wastewaters being treated, and (4) lack of proper maintenance.

a) Is there adequate accessibility to perform all required equipment maintenance? If not, describe inadequacies.

_____
_____
_____

b) If the separator is the oil-coalescing interceptor type, are the parallel plates showing signs of clogging? If so, are there provisions in place to clean the plates? Also, check for proper spacing of the plates per manufacturer=s recommendations (typically between 1/2 and 1 1/4 inches). *Note: Higher suspended solids concentrations create a greater potential for the plates to clog. Coalescing interceptor types should not be used when suspended solids concentrations exceed 300 mg/L.*

_____
_____
_____

c) Poor performance may be a result of oil/water emulsions which cannot be separated by gravity or with coalescing media. These emulsions are typically created by high shear centrifugal pumps, dirt, or emulsifying chemicals. Check for the presence of any of these possibilities and evaluate alternatives if these conditions exist.

_____
_____
_____

d) Most separators do not have adequate capacity to handle large surges in flow. If flow surges exist, the water leaving the separator may not have had adequate detention time. Check for this possibility. Also check for the presence and working condition of flow control devices such as orifice control in shear gates and knife gate valves. In addition, check for possible fouling of these flow control devices due to debris such as plastic cups, rag, bottles, etc.

_____
_____
_____
_____

8) Alternatives for Possible Cost Savings

a) In some cases, rather than purchase or design a new separator, an existing separator may be retrofitted. Operations, maintenance, effluent requirements, and design costs should all be taken into account.

_____
_____

b) Have new oil recycling facilities been constructed in the market area? Has the potential for sale of waste oil improved? Is the quality of the oil adequate for recycling or disposal? Is disposal of the oil a DRMO responsibility?

_____
_____
_____

9) Supplemental Notes and Data

There are __ pages of supplemental notes and data attached to this checklist.