DETERMINE HYDROXIDE AND CARBONATE CONTENT IN POTASSIUM HYDROXIDE SOLUTION

(mo/yr)

Revisions		Rev:	
Letter	E.O. Number - Description		Date

Used On	Contract#:		**Your Company Name**				
Prepared By:							
Your Dept:							
Your Dept:			**LABORATORY PROCEDURE**				
Your Dept:			Your Procedure #				
Your Dept:			Size:	**A**	CAGE:		Your Form# (mo/yr) 1 of 1

Your Logo

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1.0 Purpose of Process

This procedure is used to test KOH samples from production and 45% KOH samples from barrels as a receiving/inspection (R&I) operation.

2.0 Process Definition

The percent hydroxide concentration and carbonate content of potassium hydroxide and sodium hydroxide solutions can be determined by titrating a solution sample with standard acid. A two step titration is performed on the sample. At the end point of the first titration, the hydroxide is neutralized and the carbonate is [redacted] At the end point of the second titration, the bicarbonate is converted to [redacted] The volumes of the standard acids used in the titrations are used to [redacted]

3.0 Equipment

3.1 Automatic burettes
3.2 [redacted]
3.3 Beakers, various sizes
3.4 [redacted]
3.5 Disposable pipettor tips
3.6 [redacted]
3.7 Glass pipettes
3.8 [redacted]
3.9 Stir bars
3.10 [redacted]
3.11 Volumetric flasks

4.0 Materials

4.1 [redacted]
4.2 [redacted]
4.3 [redacted]
4.4 KOH sample
4.5 [redacted]
4.6 [redacted]
4.7 [redacted]

5.0 Preparations

The following solutions may be prepared in advance:

[redacted]

6.0 Reports

6.1 Form # , KOH and Carbonate Concentration in Production KOH Samples and Form # , Receiving/Inspection (R&I) KOH Samples

7.0 Safety Requirements

7.1 Safety Equipment

The technician performing the analysis should wear the appropriate gloves, lab coat and safety glasses.

7.2 Safety Precautions

If any of the glassware breaks during the procedure the technician should [redacted] All electrical components should [redacted] If the technician has any trouble or questions he/she should [redacted]

8.0 Operator Responsibilities

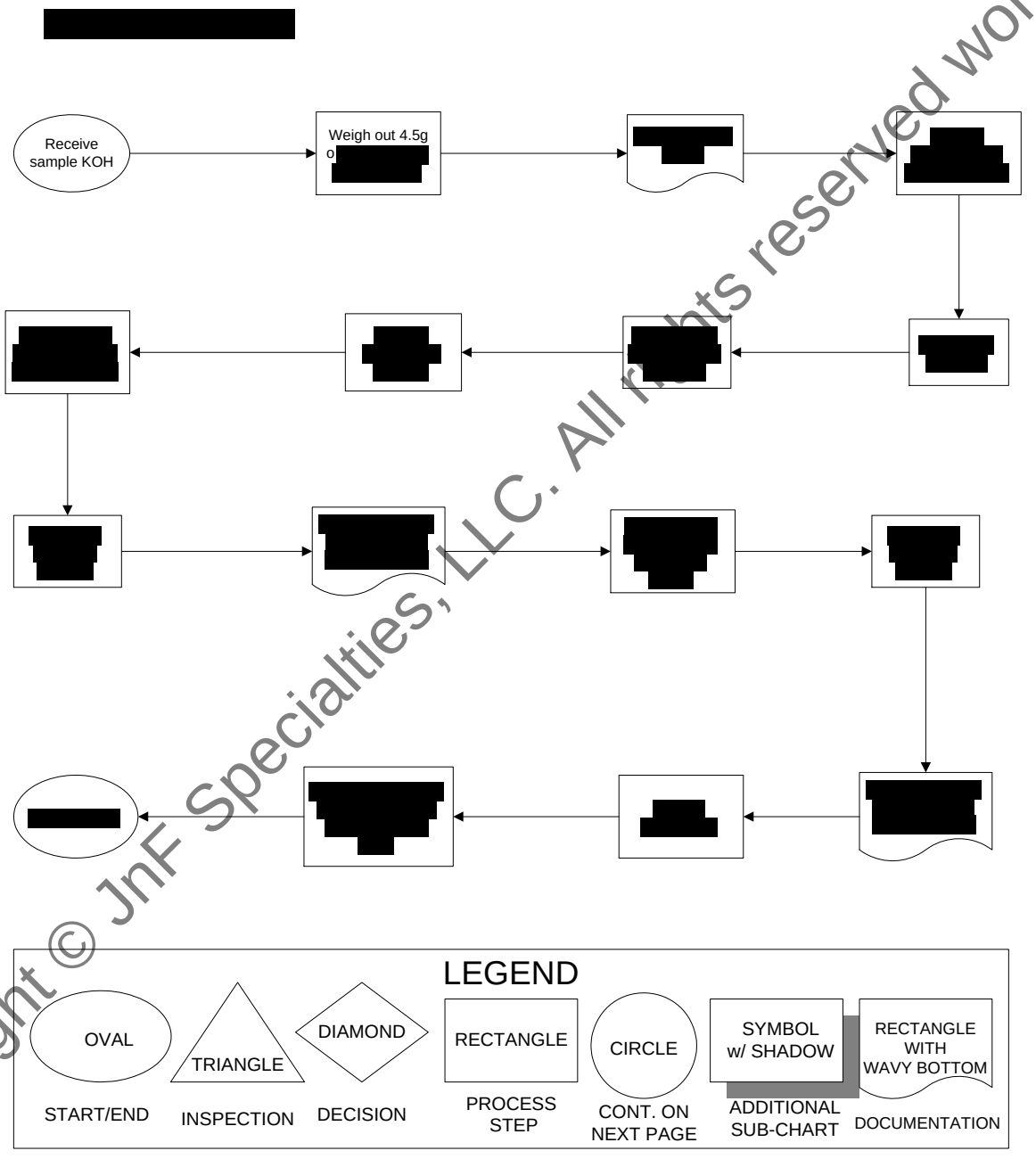
The technician should understand how to [redacted]
The technician should understand [redacted] The technician should [redacted] The technician should [redacted] The technicians will be responsible for [redacted] The technician is responsible for [redacted]
The technician performing the analysis should [redacted]

9.0 Process Controls

The analysis should be performed according to the procedure described herein. Any changes to the original document [redacted] configuration control. All of the required data should [redacted]

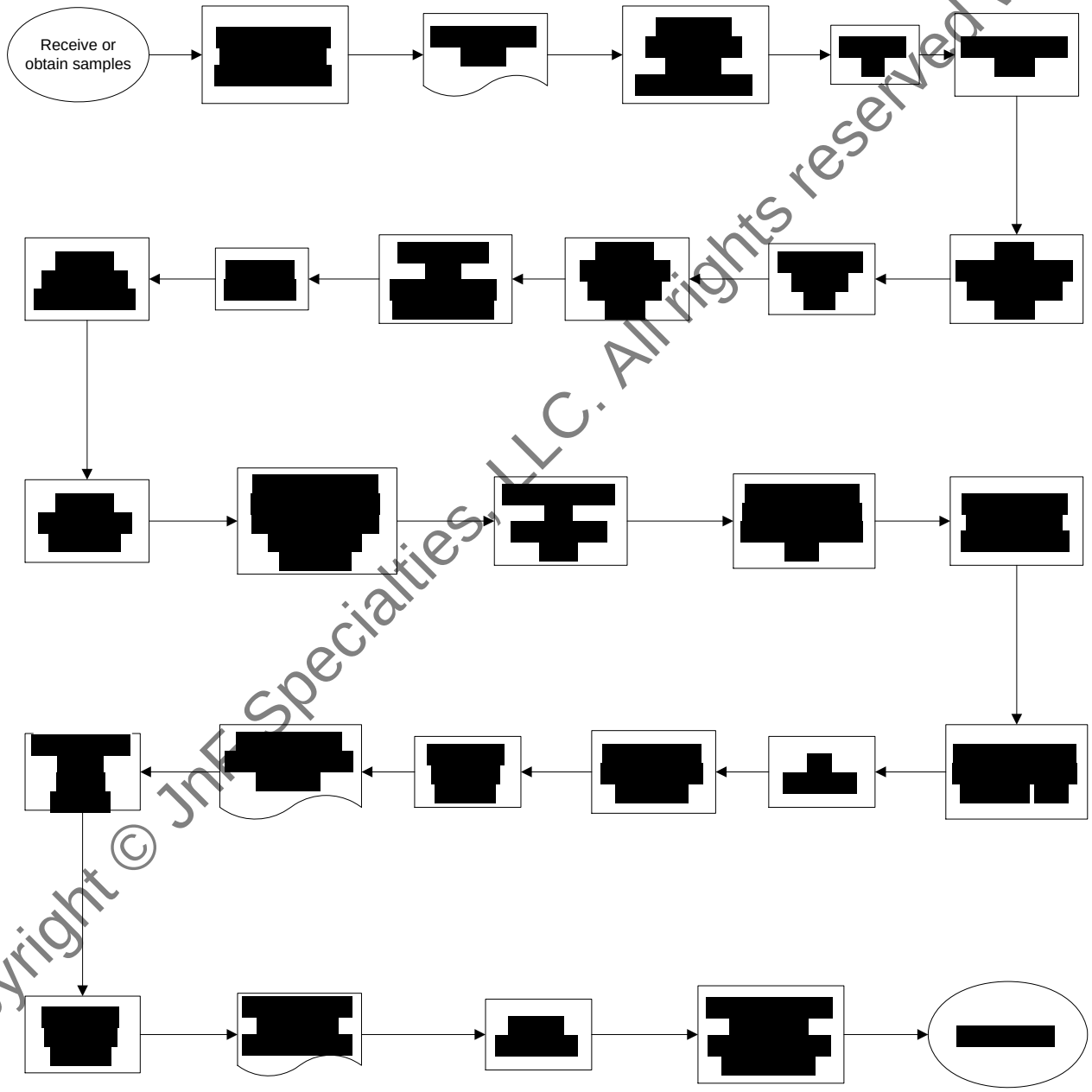
10.0 Flowcharts

PROCEDURE TO DETERMINE HYDROXIDE AND CARBONATE CONTENT IN POTASSIUM HYDROXIDE FLOW CHART



PROCEDURE TO DETERMINE HYDROXIDE AND CARBONATE CONTENT IN POTASSIUM HYDROXIDE FLOW CHART p. 2

Receiving and Inspection KOH Samples



11.0 Procedures

NOTE: The following procedure is used to determine the hydroxide and carbonate content in KOH solutions from production. [redacted]

11.1 Decarbonate Type I water.

11.1.1 [redacted]

11.1.2 [redacted].

11.1.3 [redacted]

11.1.4 [redacted]

11.1.5 [redacted]

NOTE: Special care must be taken in sampling to obtain a representative sample and to avoid absorption of water and carbon dioxide. Each bottle turned into the lab will have [redacted] For example, [redacted]

11.2 Receive sample KOH.

11.3 Obtain [redacted]

11.4 Record sample KOH weight to nearest 0.0001g on Form # .

11.5 Immediately dilute to [redacted]

11.6 [redacted]

11.7 [redacted]

11.8 Remove the solution from the heat stirrer.

11.9 Add 1-2 drops of [redacted]

11.10 Titrate with [redacted]

11.11 Record the actual normality of the acid and the volume of acid used to reach the endpoint as V1 on Form # .

11.12 Add 1-2 drops of [redacted]

11.13 Titrate with [redacted]

11.14 Record the actual normality of the acid and the volume of acid used to reach the second endpoint as V2 on Form # .

11.15 Perform calculations as shown in Appendix A.

NOTE: The procedure should be repeated to ensure there are [redacted]

11.16 Report results to [redacted]

NOTE: If the results are not [redacted]

NOTE: The following procedure is to be used to determine the hydroxide and carbonate content in KOH solutions when requested by receiving and inspection (R&I). (Method adapted

from [redacted] Two test samples [redacted] provided by R&I.

11.17 Decarbonate Type I water.

11.17.1 [redacted]

11.17.2 [redacted]

11.17.3 [redacted]

11.17.4 [redacted]

11.17.5 [redacted]

NOTE: Special care must be taken [redacted] Each sample taken from the barrels will [redacted] For example, [redacted]

11.18 Prepare [redacted] reagent solution.

11.18.1 Dissolve 120g of [redacted], in [redacted]

11.18.2 Filter if necessary

11.18.3 Transfer solution to 1000ml volumetric flask

11.18.4 Dilute to volume with [redacted]

11.19 Receive or obtain samples.

11.20 Obtain [redacted]

11.21 Record sample KOH weight to nearest 0.0001g on Form # .

11.22 Add 750ml of [redacted] to the Erlenmeyer flask.

11.23 Add a stir bar to the Erlenmeyer flask.

11.24 Set up [redacted]

11.25 Place Erlenmeyer flask on heat plate/stirrer.

11.26 Gently heat and stir [redacted]

11.27 Remove the solution from [redacted]

11.28 Cool solution and maintain [redacted]

11.29 Once cool, [redacted]

11.30 Remove system from [redacted]

11.31 Transfer the solution to [redacted]

11.32 Rinse [redacted] with [redacted]

11.33 Transfer the rinsings to [redacted]

11.34 Dilute to volume with [redacted]

11.35 With a glass pipette, transfer [redacted]

11.36 Transfer [redacted]

11.37 With a glass pipette add [redacted]

11.38 Mix thoroughly and let solution stand for [redacted]

11.39 Add 1-2 drops of [redacted]

1. Titrate with [redacted]
2. Record the actual normality of the acid and the volume of acid used to reach the endpoint as V1 on Form # .
3. Add 1-2 drops of [redacted]
4. Titrate with [redacted]
5. Record the actual normality of the acid and the volume of acid used to reach the second endpoint as V2 on Form # .
6. Perform calculations as shown in Appendix A.

NOTE: Procedure must be repeated to ensure [redacted]

11.40 Report results to Operator requesting the analysis.

NOTE: If the results are not [redacted]

12.0 Documentation

The form that must be completed for this analysis is [redacted]:
KOH and Carbonate Concentration in Production KOH Samples and when requested for Receiving/Inspection KOH Samples.

Form # requires the following:

[redacted]

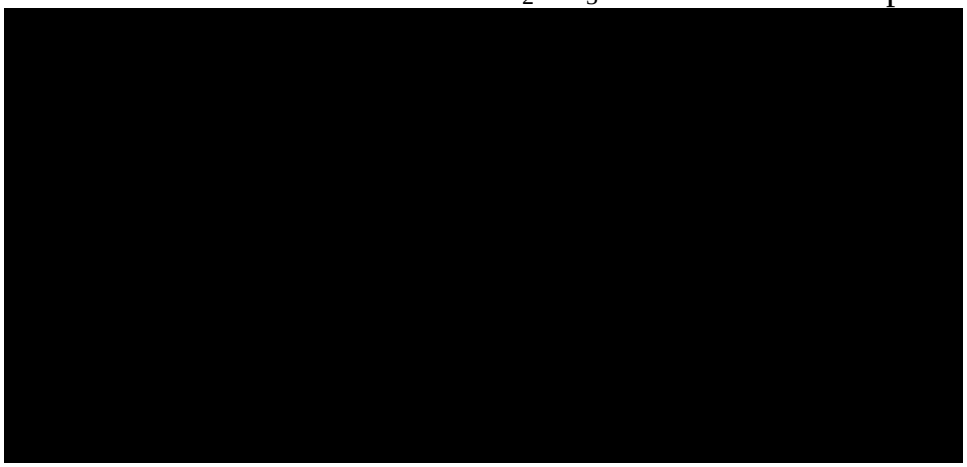
Sample weight, V1, V2, KOH wt %, K_2CO_3 wt %, [redacted]

Appendix A: Sample Calculations

Calculate wt% KOH and wt% K_2CO_3 for Production KOH samples

[redacted]

Calculate wt% KOH and wt% K_2CO_3 for R&I KOH samples



The equivalents above are taken from the ACS Specifications.

13.0 WORKMANSHIP

Adherence to applicable federal, state, local and environmental, health and safety requirements is mandatory.

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