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LOST CREEK ISR, LLC

July 27, 2012

Document Control Desk,
Director, Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Lost Creek Project, NRC License SUA-1598, Docket No. 40-9068
REQUEST FOR ADDITIONAL INFORMATION - AMENDMENT APPLICATION FOR INCLUSION OF YELLOWCAKE VACUUM DRYING-LOST CREEK ISR, LLC; (June 27, 2012)

Dear Dr. Oxenberg:

Please find behind this cover, Lost Creek ISR, LLC's responses to your Request for Additional Information dated June 27, 2012.

Please contact me or Dr. Charles Kelsey at the Casper office if you have any questions regarding this submittal.

Regards,

Steve Hatten
President
Lost Creek ISR, LLC

Cc: Theresa Horne – Ur-Energy USA Inc., Littleton

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Lost Creek Project, NRC License SUA-1598, Docket No. 40-9068; July 27, 2012
REQUEST FOR ADDITIONAL INFORMATION-AMENDMENT APPLICATION FOR INCLUSION OF YELLOWCAKE VACUUM DRYING-LOST CREEK ISR, LLC; (June 27, 2012)

By letter dated January 6, 2012 (ML 120470353), Lost Creek ISR, LLC (LCI) submitted to the U.S. Nuclear Regulatory Commission (NRC) staff a request to amend LCI's NRC License SUA-1598 to operate two yellowcake vacuum dryers within its processing plant and subsequent shipment of vacuum dried yellowcake. The request included a Vacuum Dryer Supplement that described changes to sections in the Technical (TR) and Environmental Reports (ER). Also included in the supplement were revised TR Figures 1.5-2b and 5.7-1 and TR Plate 3.1-1 , and a dryer flow diagram for TR Section 3.3. LCI provided clarifications regarding the amendment application in an email dated March 5, 2012 (ML 120670150), that included a table describing non-radioactive emissions expected from the dryer (ML 120670157) and TR Figure 4. 1-3 describing the ventilation diagram of the processing plant (ML 120670164). **NRC staff completes its technical review of this request and offers the following request for additional information.**

TR Section 1 Lost Creek Project Schedule

Is the schedule (Figure 1.7-2 of technical report) current? If not, please provide a revised schedule to ensure compliance with 10 CFR 40.32.

Please find attached a revised Figure 1.7-2 entitled "Lost Creek Development, Production and Restoration Schedule." While the schedule did not change, the number of total mine units was condensed from six (6) to three (3) pursuant to a request from the Wyoming Department of Environmental Quality – Land Quality Division. The total area and timing of the disturbance have not changed; only the names of the affected areas.

This schedule is provided as an alternate schedule as required in 10 CFR 40.42(f) since reclamation cannot be completed within the time limitation described in 10 CFR 40.42(d).

TR Section 3.0 Description of the Proposed Facility

The staff finds the following information is needed to support the environmental assessment (EA):

1. What other types of dryers were considered to be used in the processing plant?

Alternative Types of Dryers Considered:

a. Multi-Hearth Dryer

This type of dryer was considered because it can be operated extremely efficiently. It was ruled out for the following reasons:

- Multi-Hearth does not work well in a batch process, since with Multi-Hearth, yellowcake is accumulated in a thickener tank for extended periods. All the other aspects of the LCI plant have been designed for a batch process and the dryer must function with that system.
- From the NRC's GEIS, there would have to be a venturi scrubber on the exhaust from Multi-Hearth to prevent any airborne particulates from being released. With vacuum technology, all the exhaust from the dryer is vented back into the building. High

temperature firing, such as achieved by a Multi-Hearth dryer, yields a much less soluble product which is more difficult to expel from the body when there is an uptake. Therefore, taking ALARA principles into account, it was determined that Multi-Hearth was not the best method.

b. Filter-Dryer

These types of dryers, similar to that presented at http://www.charles-thompson.co.uk/filter.html, were examined in detail. The positive aspect of these dryers is that they improve efficiency of the process by eliminating the two-stage drying. Typically, the precipitate is washed and partially dewatered in a filter press, then re-slurried to transport into a dryer. These units have the ability to wash, press, and dry in a single unit. While these units are extremely interesting, they were ruled out for the following reasons:

- Maintenance intensive. Talking with a manufacturer, there are a lot of moving parts and hydraulic components. They require a lot of maintenance and upkeep to keep the dryers in the proper working order. Many of the system components are highly specialized. The manufacturer would prefer one of their technicians perform the work or we send a maintenance technician(s) away for the specialized training.
- ALARA principles. Since the units are maintenance intensive, the majority of the work has to be performed inside the dryer units. We would have to have one of our maintenance technicians inside the dryers often performing routine maintenance checks. For this reason, it was determined that this drying technology was not the best technology for our workers.

c. Pharmaceutical Dryers

Pharmaceutical dryers were considered because they are a "like" industry. The pharmaceutical industry also deals with fine powders. While there are many types of pharmaceutical dryers, the dryers that would reasonable fit LCI needs were ruled out for the following reason:

- Capacity. The capacities for the pharmaceutical dryers were not economical for our planned production.

2. Bag House Operation:

a. How much dust is expected to be collected?

Very little dust will be collected. Bag houses are designed to drop the dust back into dryer. Compressed air is periodically injected within the bag housing which dislodges the dust back into the dryer.

b. How often will the bag filters be changed?

The bag filters will be changed based on the differential pressure across the bag house. As the differential pressure indicates clogged bags, the bag filters will be changed. Historically, in similar ISR dryer systems the bag change interval is one year.

c. What will the disposition of the used bag filters be?

The used filter bags will be disposed of as 11e.(2) by product material.

3. Air Quality Sampling and Monitoring:

a. Will there be any additional monitoring of air quality outside the processing plant?

No. TR Section 2.9.3.7 "Radiological Air Particulate (High-Vol) Sampling" details the LCI Program for air monitoring external to the plant. In anticipation of a Dryer Amendment Application, five air particulate samplers were installed in November 2007 to collect baseline RG 4.14 data. The sampling program has been evaluated by NRC and revised through NRC RAI submissions (see NRC ML102420249 and ML102420238).

Other non-radioactive emissions from the propane dryer heaters are estimated, not monitored, as discussed below in the response "TR Section 4.1.2.1 Particulates".

b. If there is, what are the locations? (include a map)

See above response to 3**a.** A map has been previously submitted as referenced above.

c. What would be monitored, and how often would samples be taken?

See above response to 3**a.** The sampling program is detailed as described above. Specifically, the Air Particulate (AP) Filters are collected approximately weekly and for each of the five AP units, the weekly filters are composited and submitted quarterly to be analyzed per RG 4.14 for Unat, Ra226, Th230 and Pb210.

4. Waste Water Disposal:

a. Drum wash down:

i. How often will this be done?

Drum wash down will occur in the dryer room, after drum is sealed, once per drum to ensure that the outside is clean.

ii. How much water will be used?

A minimal volume will be used; an estimated volume would be on the order of 5 gallons or less per drum.

iii. How will the wash down be collected?

The wash down water will be collected in the sump in the dryer room. It will be routed from the sump to either a filter press or directly to the waste water tanks. Water from these tanks goes to the deep disposal well.

iv. Will the wash down be filtered/treated?

If the water is going to the filter press, it will pass through a large micron filter before it enters. If the water goes directly to the waste water tanks, it will not be filtered.

v. Where will the wash down be disposed?

The portion of the water that goes to the waste water tanks will go to the deep disposal well.

b. Condensate Tank:

i. Will there be any waste generated?

The waste generated will be the water pulled through the vacuum system. However, this water is essentially distilled water and will generally be recycled into the process instead of wasted.

ii. How much/how often?

It is estimated to be around 300 gallons per dryer batch.

iii. How will it be collected, and where will it be disposed?

It will be collected in the condensate tank and, on rare occasions that it isn't recycled, routed to the disposal system through the sumps to the water make-up/disposal system.

TR Section 3.3 Supplemental Dryer Flow Diagram

LCI did not number the diagram consistently as the other figures and plates in the TR and ER. Therefore, the staff requests that LCI label the diagram with the appropriate number (i.e., Figure 3.3-1) for easy identification.

Please find attached the "Supplemental Dryer Flow Diagram" labeled as "Figure 3.3-1","Dryer Flow Diagram".

TR Section 4.1.2.1 Particulates

The propane emissions table needs the following :
1. Title
2. Source

Please find attached, the labeled Table 4.1-1a, "Vacuum Dryer Propane Combustion Emissions" (replaces ML120670157) which will be referenced in Section 4.1.1 of the LCI TR as another source of Non-Radioactive Particulates. The source of the Emission Factors is in the Table footnote, and in the April 30, 2012, Public Teleconference Summary (ML12153A287) the source was cited as *AP-42, Vol. 1, 5th ed., 1995.Compilation of Air Pollutant Emission Factors, updated 2008 Chap. 1, Sec. 5 Liquefied Petroleum Gas Combustion*

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TR Section 4.1 Gas Emissions

Figure 4.1-1 shows 19 roof penetrations. In preparation of the EA, the staff finds that it is unclear if all 19 roof penetrations are from the propane heaters. Please provide clarification to the illustration.

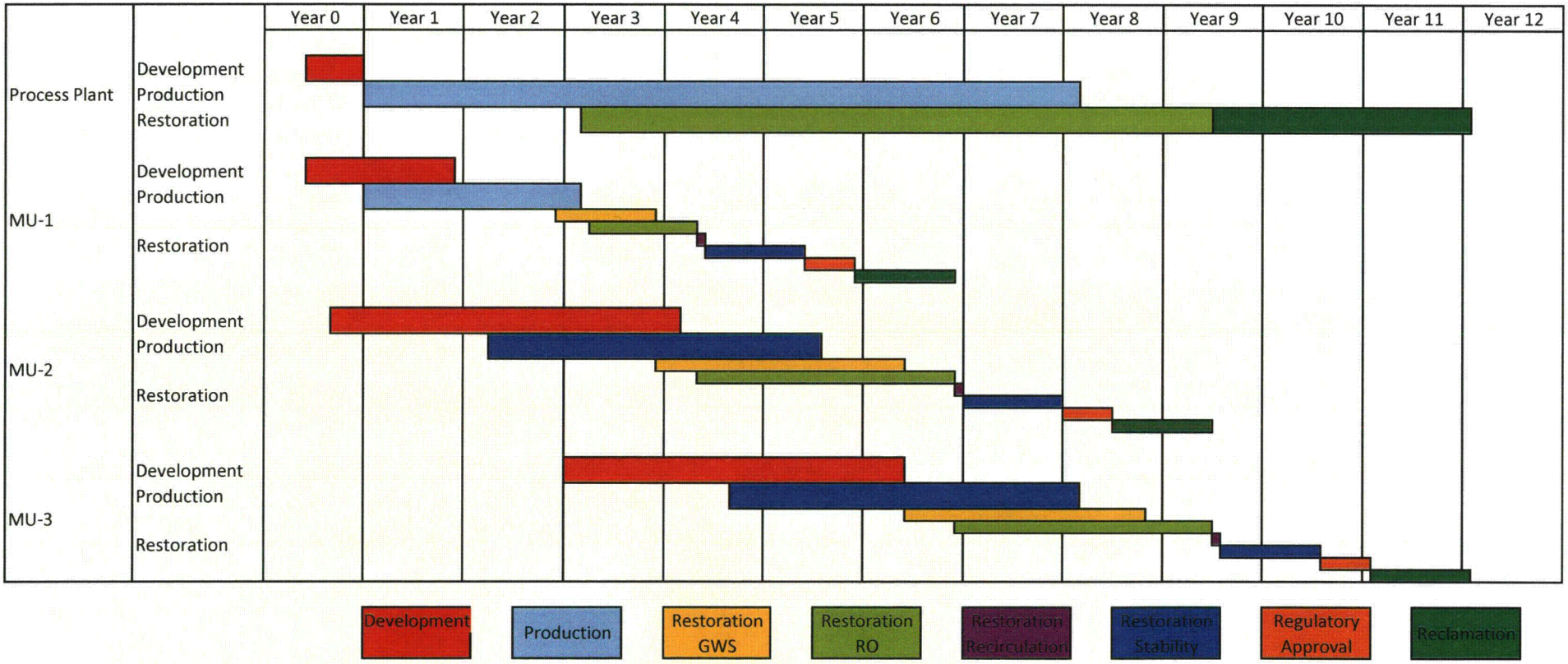
TR Figure 4.1-1 is not a diagram of Plant Ventilation (TR Figure 4.1-1 Pourbaix Diagram for Uranium in Non-Complexing Aqueous Media). The Plant Ventilation diagram is Figure 4.3-1

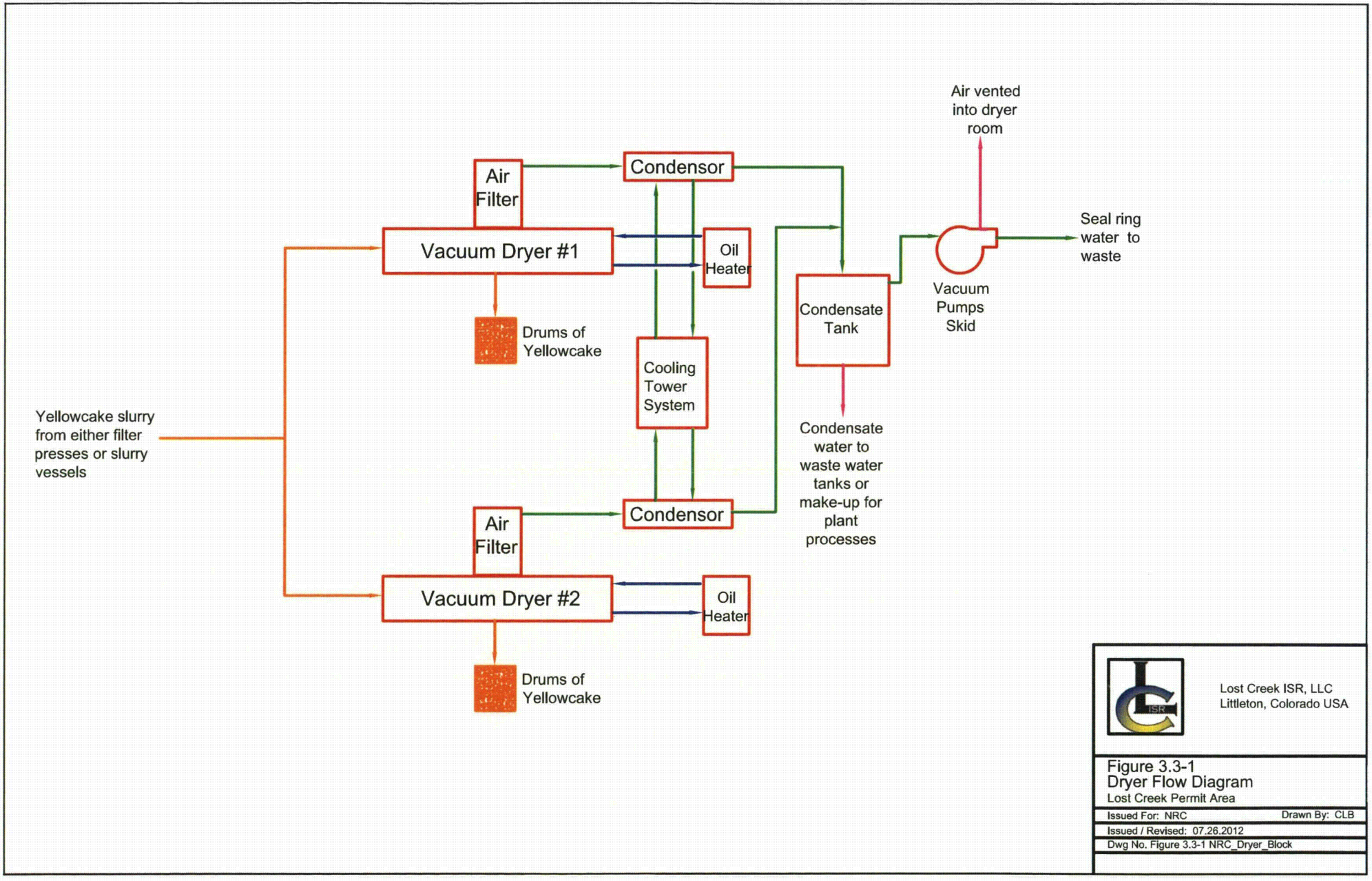
Clarification was provided in email submitted to NRC on March 05, 2012 (ML120670150 of ML120670278). The email included a revised Figure 4.3-1 (ML120670164). That Figure 4.3-1 was revised to show all plant ventilation by outlet type and to clarify that not all 19 penetrations come from propane heaters. Many of the outlet vents are from the process tanks. The propane heaters for the dryers may be exhausted directly within the large plant area where they are located external to the dryer rooms. In that case they will exhaust through plant ventilation. Depending on the final design the propane heaters for the dryers may be exhausted through added dedicated outlets. This was also stated in the April 30, 2012, Public Teleconference Summary (ML12153A287).

ATTACHMENTS

Revised TR Figure 1.7-2 (Revised TR Figure 3.1-3) Lost Creek Project Development, Production and Restoration Schedule
Re-labeled Figure 3.3-1 Dryer Flow Diagram
Labeled Table 4.1-1a Vacuum Dryer Propane Combustion Emissions (replaces ML 120670157)

Figure 1.7-2
Lost Creek Project Development, Production and Restoration Schedule





Lost Creek ISR, LLC
Littleton, Colorado USA

Figure 3.3-1
Dryer Flow Diagram
Lost Creek Permit Area

Issued For: NRC — Drawn By: CLB
Issued / Revised: 07.26.2012
Dwg No. Figure 3.3-1 NRC_Dryer_Block

TABLE 4.1-1a Vacuum Dryer Propane Combustion Emissions

Emission	Propane Emission Factor from EPA Document (lb/1,000 gal)	Ft^3 of Propane/Hour	Hours/day in Operation	Gallons of Propane Used/Day (calculated based on 1 gal=36.38 ft3)	lbs of Emissions/Day
PM Filterable	0.2	3000	12	989.6	0.2
PM Condensable	0.5	3000	12	989.6	0.5
PM Total	0.7	3000	12	989.6	0.7
SO_2	0.10	3000	12	989.6	0.10
NO_x	13	3000	12	989.6	13
N_2O	0.9	3000	12	989.6	0.9
CO_2	12500	3000	12	989.6	12369
CO_2	7.5	3000	12	989.6	7.4
TOC	1.0	3000	12	989.6	1.0
CH_4	0.2	3000	12	989.6	0.2

Column B factors are from Table 1.5-1 "Emission Factors for LPG Combustion Emission Factor Rating: E" which is part of EPA's AP42 Report. http://www.epa.gov/ttnchie1/ap42/ch01/final/c01s05.pdf

The conversion rate of 1 gal propane = 36.38 ft3 is from the Propane Gas Assoc. of Canada. A range of conversions were available on-line but this ratio fell within the range available