



**JOINT GENOME INSTITUTE**  
UNITED STATES DEPARTMENT OF ENERGY

# Overview of Sample Management

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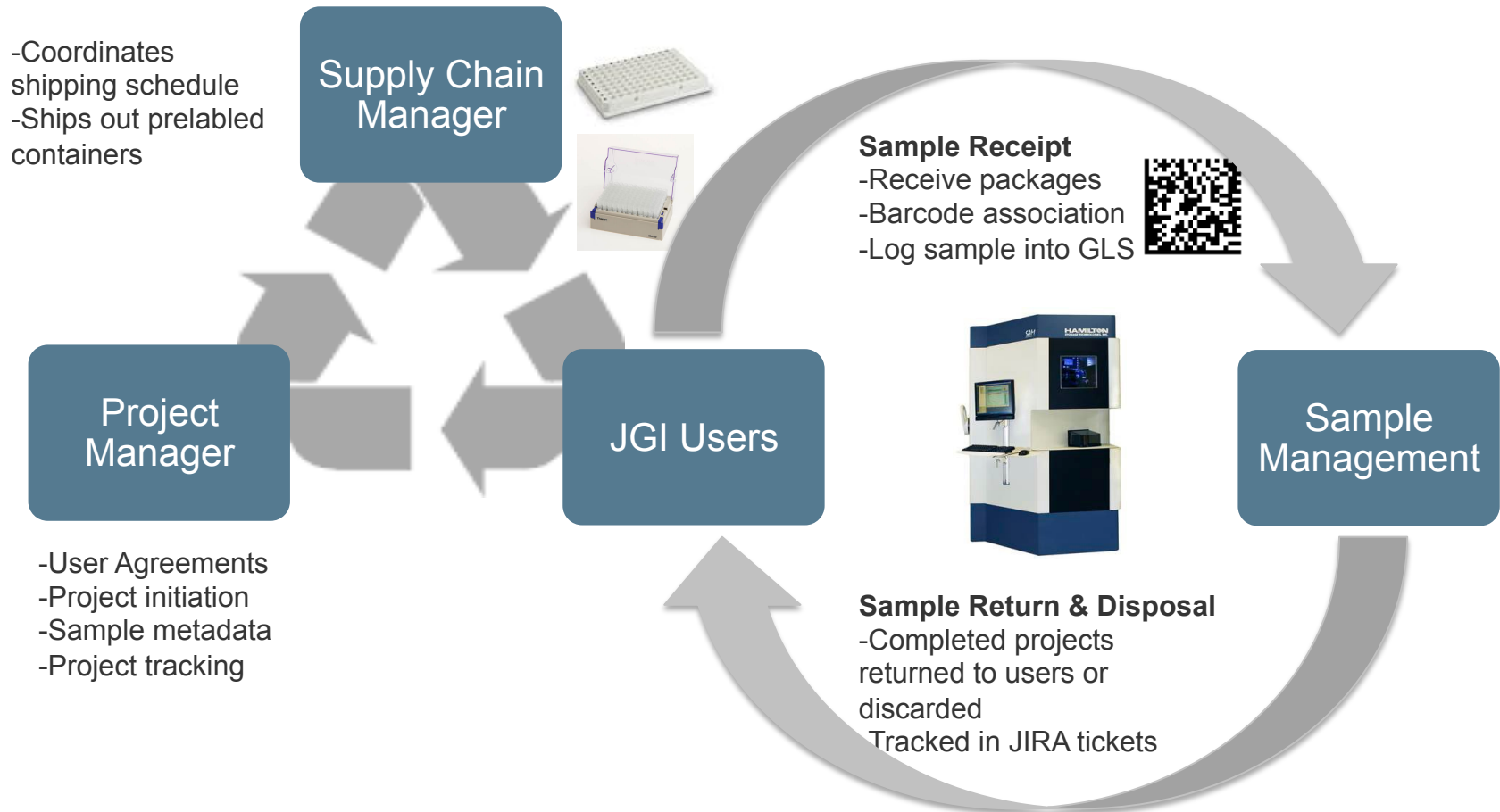
- **Sample Receipt**
- **Sample Tracking/Inventory**
- **Sample Quantification & Quality Assessment**
- **Sample Aliquots**
- **Technical Support**

Sample  
Storage

Sample  
QC

Sample  
Aliquot

# Sample Storage

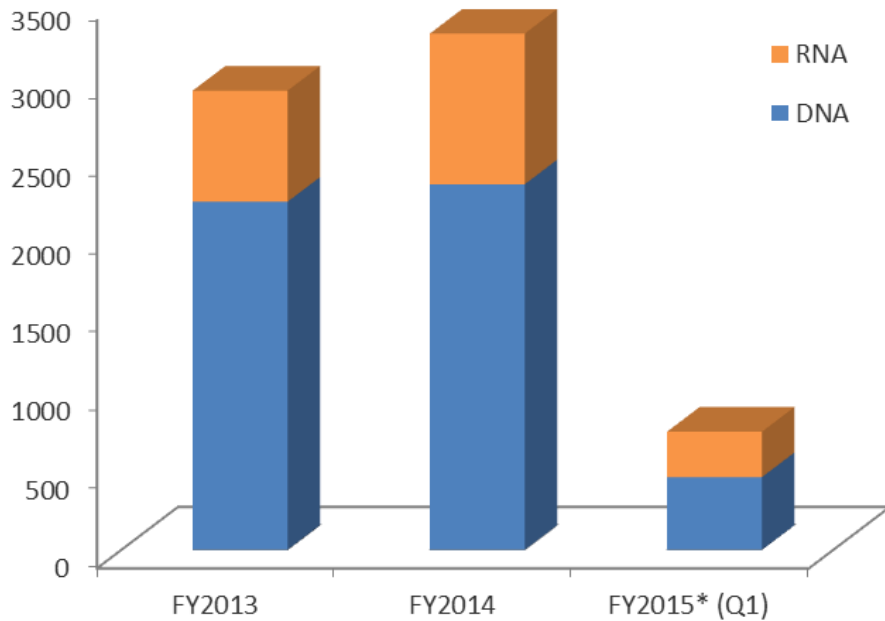


- **Measure sample volume**
- **Top-off low volume samples**
- **Quantify samples using fluorometric dyes**
- **Assess sample quality based on scope of work (SOW)**
- **Record measurements and analysis in LIMS**

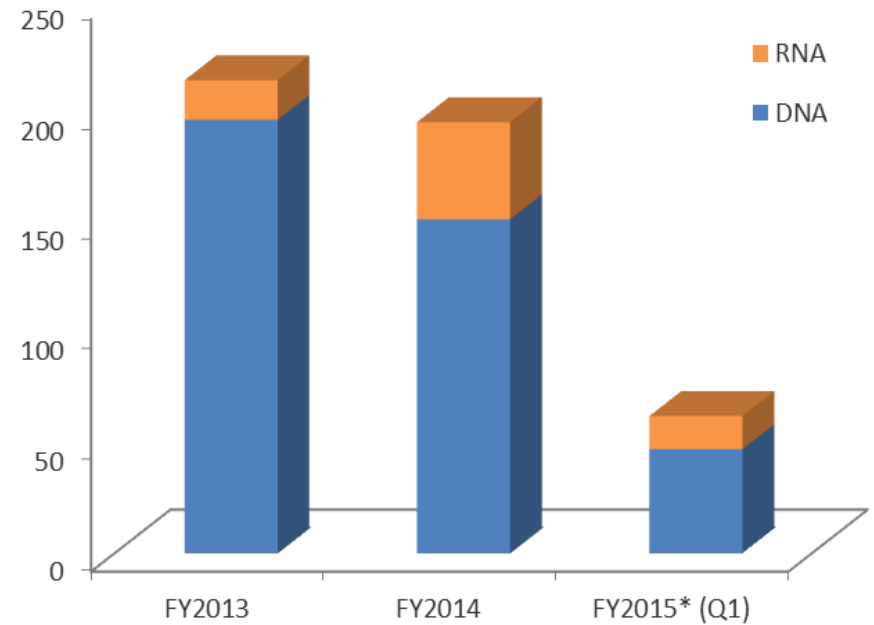
- **Transfer required amount for library construction**
- **Top-off low volumes to required amount**
- **Create intermediate dilution for highly concentrated samples**
- **Re-array partial plates and tubes into a single final destination plate for library construction**
- **Record sample transfer information in LIMS**

# Throughput

### Tubes processed by Year



### Plates processed by Year



# Automation



## Storage

## Volume Check

## QC

## Aliquot

- Sample archival
- Manage in-progress containers
- Houses a total of 532 plates and 11,320 tubes.
- Barcode association  
Retrieves upon command
- Improved tracking
- Provides security
- Eliminates the human error

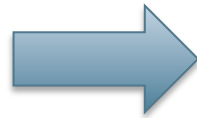
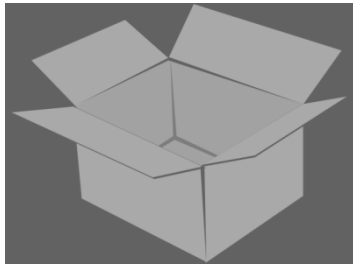
- Sonic pulses
- Non-contact measurement
- Compatible with plates and tubes

- Microplate reader for quantification
- NanoDrop for the purity
- Agarose gels for DNA quality
- 2 LabChips for RNA sample quality

- 2 STARlets in production
- Main workforce for both sample QC and aliquots
- Integrated tube decapper
- Re-array capability
- High consistency
- Reduces ergonomic issues



# Sample Receipt



## Correct Packaging



Example of tube **WITH** secondary containment (15mL conical tube on crushed dry ice).

Multiple sample tubes can be placed in a larger conical tube or secondary containment.



Properly labeled and tightly sealed with a FOIL seal. Ensure that the tab of the foil seal is NOT on the plate label side. Make sure label is on **A12** side.



Example of a plate **WITH** secondary containment (cardboard box on crushed dry ice).

## Incorrect Packaging



Example of tubes arriving **WITHOUT** secondary containment (placed directly in dry ice).



**DO NOT** use clear plate seals.



Example of a plate arriving **WITHOUT** secondary containment  
- plate seal has been damaged.

## Common concerns:

- Packaging
- Dry ice
- Secondary containers
- Container seals
- Labels/documents

# Sample Quantity

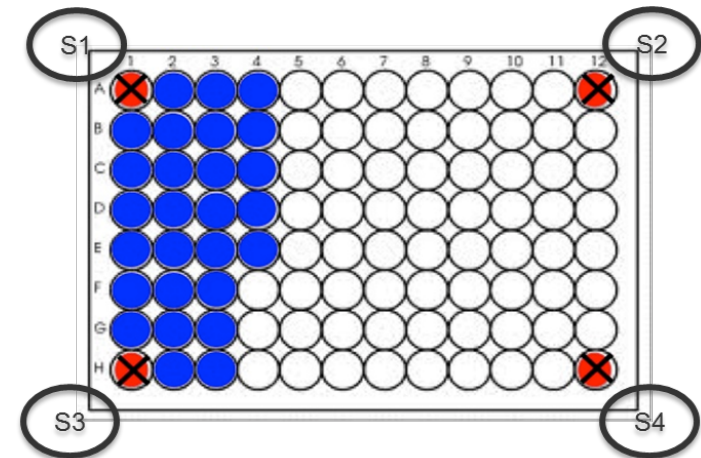
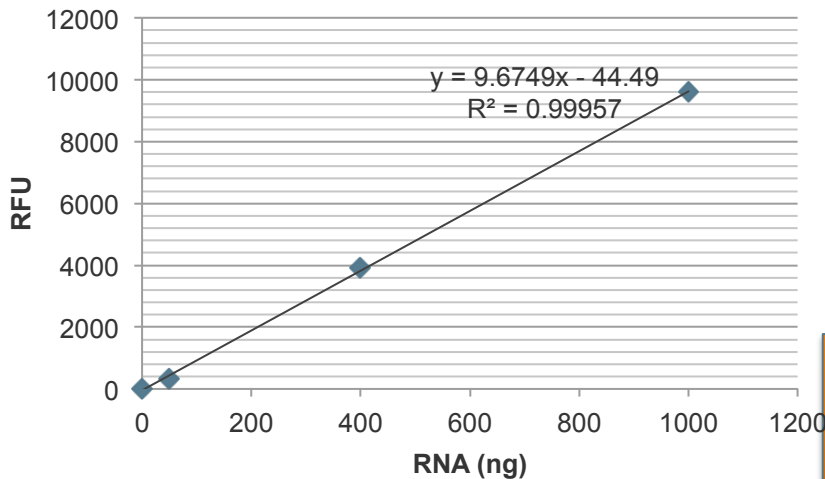
## DNA assays

Quantifluor dsDNA system  
(0.4-20ng, 2-200ng)

## RNA assays

Quant-iT RNA BR kit (50-1000ng)  
Quantifluor RNA system (1.5-80ng)

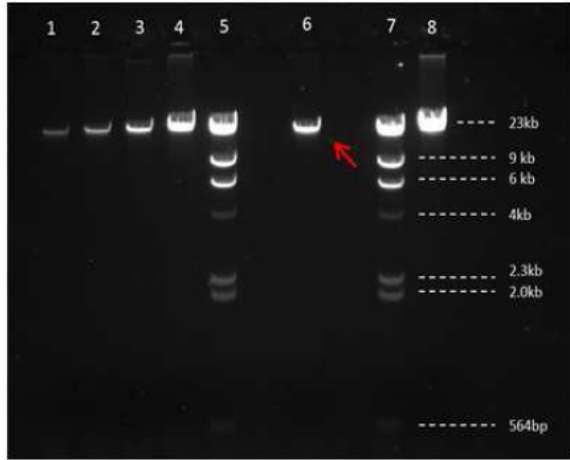
## Calibration Curve



## Common cause for discrepancy:

- Pipetting errors
- Calibration curve
- Contaminants
- Assays/kits
- Standards

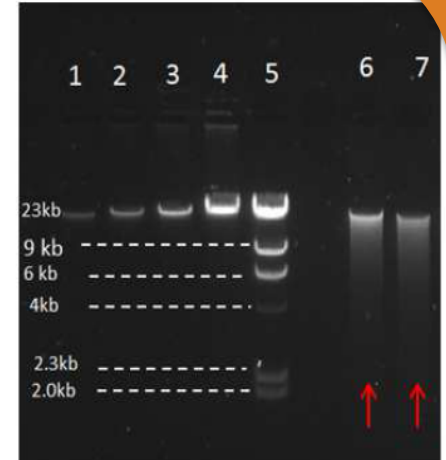
# Sample Quality



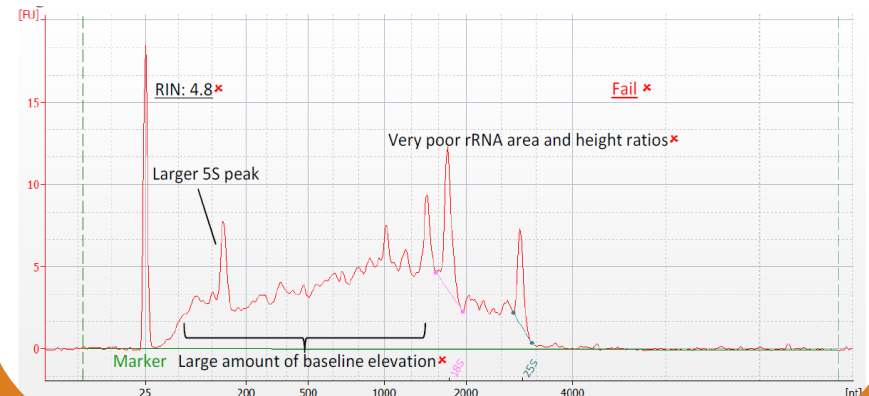
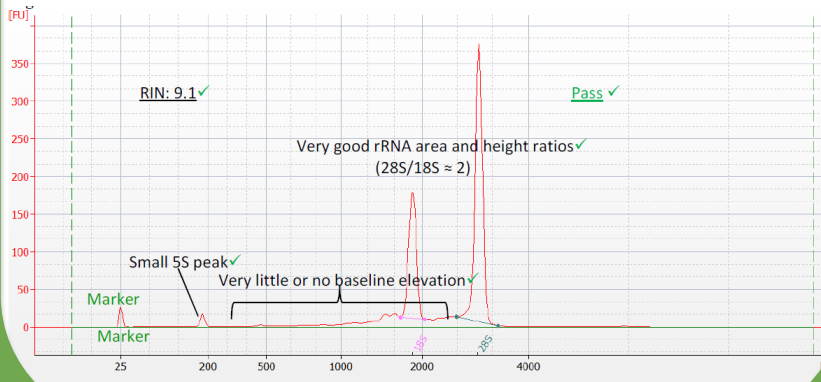
**A. Lane 6 – High molecular weight DNA at 23kb**



**B. Lane 6 & 7 – Partially degraded DNA (smearing visible)**



**C. Lane 6 & 7 – Completely degraded DNA**



# Sample QC Requirements per Library

Relaxed

Stringent

## Volume Check

All library types

## Quantity

All library types except:

### Amplicon sequencing

- Ribosomal iTags

## Quality

### LMP

- 8kb CLRS
- 4kb CLRS
- 2.5kb CLRS
- Nextera LMP

### PacBio Long reads

### Stranded RNA-seq

- Poly A selection
- rRNA depletion
- FFPE/LCM

### smRNA

- Eukaryote
- Prokaryote

### Full length

- Iso-seq

## Purity

### Long reads

- PacBio 20kb
- PacBio >10kb
- PacBio 3kb
- PacBio 2kb



# Sample Management Team

How may we assist you?



Kathleen Lail



Juying Yan



Mansi Chovatia



Aditi Sharma



Tim Williams