

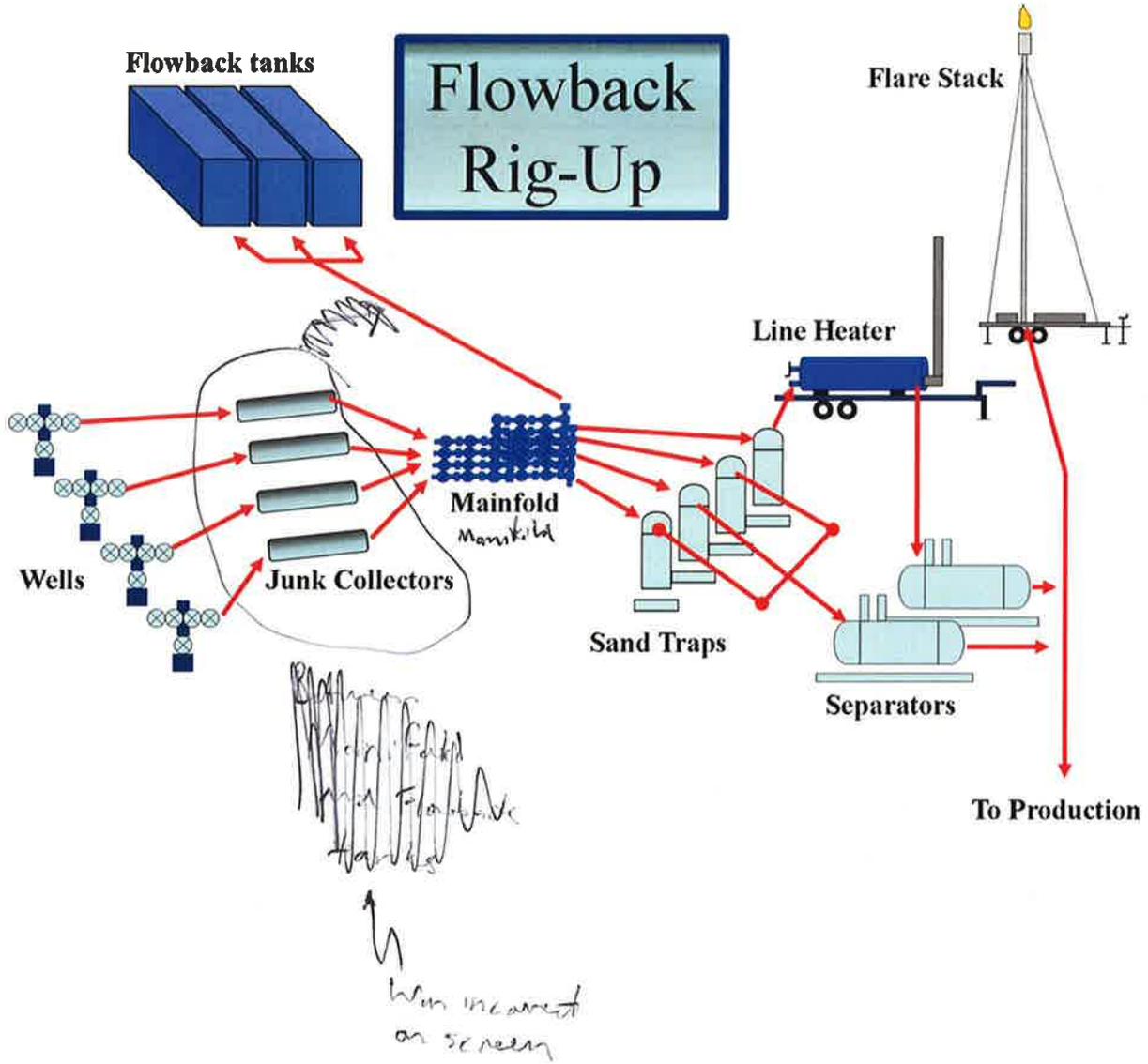
# Post-Frac Flowback



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## Typical Flowback rig up



Accumulator

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## Flowback Equipment

### Multi-well pad Flowback

- ERS can flowback up to 20 wells at a time. Typical pads range from 4 to 16 wells each.



Sim Ops  
Sand like (Psy Mops)  
Multiple well pads on  
a single pad.

## Separators



- Remove oil and water from the gas
- Pressure ranges from 250 to 1,440 psi

*Marcellus Wells  
10% comes back  
sometimes 30-40%  
They recycle 4hrs water  
for the most jobs*

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## Line Heaters



- Used for high-rate flowbacks to prevent freezing effects cause by gas expansion.
- Heating Capacity up to 2.5 million BTU

## Sand Traps



- Used to separate sand from the flow stream.
- This protects the separator and other equipment from sand erosion.
- Sand is caught and dumped to pit or tank.

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## Ball Catchers



- The ball catcher is used when frac balls (a down hole check valve device) is used during fracturing.
- The ball catcher is a pressurized vessel with ports large enough to catch softball sized frac balls.

## Junk Catcher



- Junk catchers are used to catch pieces of plugs during plug drillout operations.
- If not caught, the pieces would plug off the chokes and all fluid flow.

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## Flare Stack

The “pilot light” of a flowback location.

- Used when a pipeline is not available for produced gas.



## Flowback Tanks



- Flow-back tanks are used to contain reservoir fluids and sand which are flowed to surface.
- Flow-back tanks replace reserve pits in flow-back operations and are environmentally friendly.



*Don't use pits - environmental concerns*

## Flowback Manifolds



- Allows many wells to the flowback manifold come to one point.
- All flows can then be individually or corporately sent to the tank or the separator
- Flowback manifolds consist of valves and chokes.



*All one well //*

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## On-Site Personnel

### Rig-up Crew

- A team typically consisting of 2-5 workers, specifically designated to rig in all the iron and equipment needed to start a flowback.

### Field Operations Supervisor (FOS)

- The person designated to be the direct contact between customer and field workers. (Note: Not always present on wellsite)

### Day/Night shift Supervisors

- Must be present on wellsite at all times during the course of the flowback.
- Shift supervisor is in charge of flowback operations during his/her shift.

### Day/Night shift Technician

- Present as an aid to the shift supervisor

*\*In accordance with OSHA standard 1910.151(b), ERS employees have been American Red Cross first aid and CPR certified.*

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## Personal Protective Equipment (PPE)

### Required PPE

- Hard hat
- Safety glasses
- Steel-toed boots
- LEL meter
- F-R coveralls
- Gloves
- Hearing protection



# Flow-back Safety Issues

## Washout

### Key Points:

- Sand in a fluid travelling at more than 41 feet per second will wash out iron.
- We use chokes to control both sand velocity and down stream pressure



## Securing Flow Lines

### Key Points:

- Weakened flow-lines can come apart.
- Iron is regularly tested, but flowline restraints are still necessary just in case.
- Current systems include 1,000 pound blocks used in conjunction with cable & clamp systems.





- Blocks
- Cables
- Clamps
- Clevises.

*Rib-n-spike*

## Fire and Explosion

- Grounding
- Bonding
- LEL meters
- Focus on air quality



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## Tank Measurement

Key Points;

- Explosion proof flashlights
- Wood measuring sticks
- Keep yourself grounded
- Toxic vapors
- Never jump



## 5 Rules of Flow-back Safety

1. Restrain flow-lines

2. No wellhead torque

3. Use chokes to control flow

4. No swings

*They can cause the pipe to wrap around like a fire hose*

5. No direction changes at end of lines

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