

Sampling Associates International, LLC
Norfolk Southern Wheelersburg Terminal
Wheelersburg, Ohio, U.S.A.



Norfolk Southern Wheelersburg Terminal (NSWT)

Coal is received from the *Norfolk Southern Corporation* railroad and unloaded from the railcars by a single-car rotary dumper. As the material is conveyed to a customer-specific stockpile, it can be sampled by the **As-Received Mechanical Sampling System** located on Conveyor #1, which is 1800 mm (72 in.) in width.

When a barge or train arrives to receive coal for shipment, the material is moved by front-end loaders to traveling variable-flow hoppers positioned over a conveyor which bisects the stockyard. As the coal travels to either the Train Load-Out or the Barge Loader, it can be sampled by the **As-Shipped Mechanical Sampling System** located on Conveyor #3, which is 1800 mm (72 in.) in width.

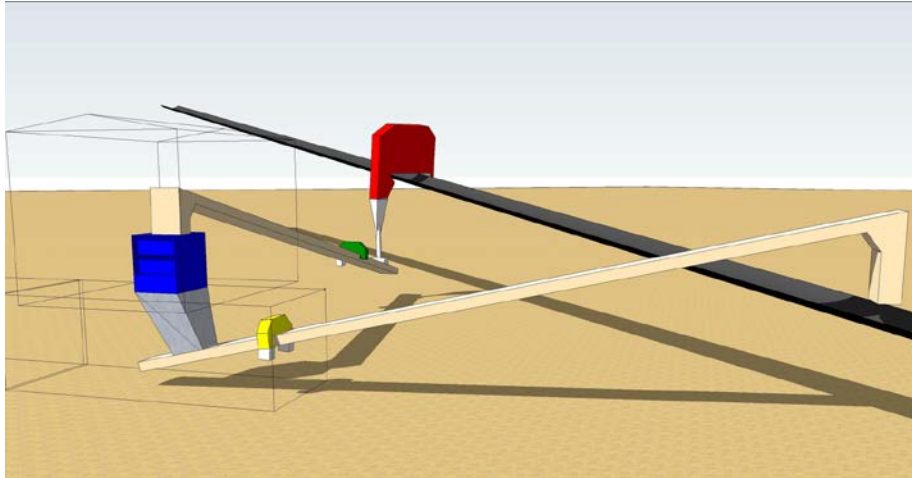
Both the As-Shipped and the As-Received Mechanical Sampling Systems were manufactured by **Precision Samplers Inc.** (PSI) with designs and operating programs described below.

As-Shipped Mechanical Sampling System (AS)



(Measurements and weights provided herein are approximate and for general reference only.)

The system's key components are listed below and operate to meet or exceed ASTM standards when handling a product of 50 mm x 0 (2 in. x 0) or less. The operating program can be customized to meet customer-specific sampling needs while maintaining industry standards.



Primary Sampler - This cross-belt component (red) operates at a minimum 1.5 times the speed of Conveyor #3 (black). The cutter opening width is 188 mm (7.5 in.) which allows for the collection of a 47 kg (104 lb.) increment. Each primary increment is gravity-fed to the Primary Feeder Conveyor. A plugged-chute indicator and a vibrator are installed on the transfer chute of this component to facilitate material flow. Increment frequencies are adjustable, as required, with typical consignment settings as follows:

- **Barge or Unit Train** – 36 sec.
- **10-Car Composite** – 27 sec.

Primary Feeder Conveyor - This 450 mm (18 in.) wide, enclosed conveyor (dark gray) delivers primary increments passed the cross-belt Size-Bulk Sampler to the Crusher. The conveyor belt speed is adjustable as required, with current settings as follows:

- **Barge or Unit Train** – 0.1 m/s (25 fpm)
- **10-Car Composite** – 0.1 m/s (32 fpm)

Size-Bulk Sampler - This component is utilized for collecting an uncrushed sample - for a size analysis or other special testing - which is separate from the sample collected for the standard chemical analyses. This cross-belt component (green) operates at a minimum 1.5 times the speed of the Primary Feeder Conveyor and extracts a 3.1 kg (6.2 lb.) increment. The component is designed with a single-direction cutter with an opening width of 200 mm (8 in.). Sample collection frequencies are adjustable. Increments are gravity-fed into a heavy-duty bag affixed to a collection chute.

Hammer Mill Crusher - The Jeffrey-Rader 30ABE Crusher (blue) is comprised of a motor, a rotor with swing hammers, and a set of 16 mm (5/8 in.) round-holed screens. A plugged-chute indicator and a vibrator are installed at both the inlet and outlet chutes of the Crusher to facilitate material flow. Sample material is crushed down to a top size of 4-mesh, then gravity-fed through a chute to the Secondary / Reject Conveyor.

Secondary / Reject Conveyor - This 450 mm (18 in.) wide, enclosed conveyor (tan) moves crushed sample material passed the cross-belt Secondary Sampler. Material not retained for the final-save sample is deposited back to the main flow on the terminal's Conveyor #3. The conveyor speed is adjustable as required, with current settings as follows:

- **Barge** – 0.4 m/s (81 fpm)
- **Unit Train** – 0.3 m/s (61 fpm)
- **10-Car Composite** – 0.4 m/s (78 fpm)

Secondary Sampler - This cross-belt component (yellow) operates at a minimum 1.5 times the speed of the Secondary Reject Conveyor and extracts 0.2 kg (0.4 lb.) increment. The component is designed for bi-directional operation by means of a dual-head cutter having opening widths of 38 mm (1.5 in.). Increments are gravity-fed into heavy-duty bags affixed to collection chutes. Increment-collection frequencies are adjustable, with current settings as follows:

- **Barge and Unit Train** – 20 sec.
- **10-Car Composite** – 14 sec.

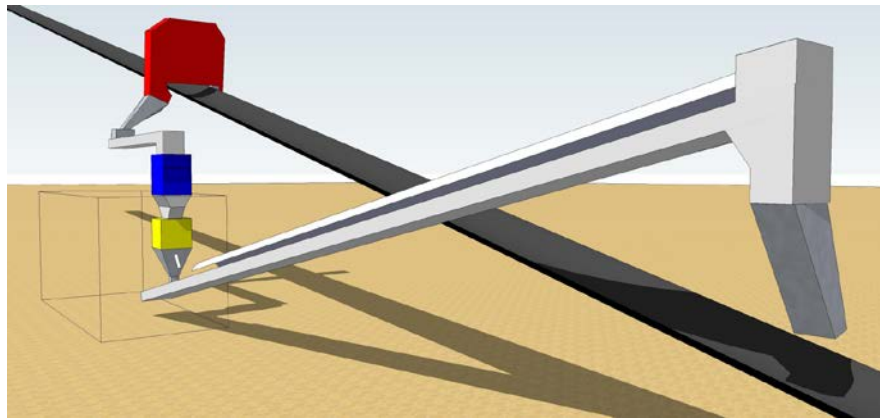
Save-Sample Ratio – The Sample Ratios for each of the following consignments using current settings are as follows:

- **Barge** – 7.2 kg (14.4 lb.) final-save sample per 1,000 net tons of material
- **Unit Train** – 10.3 kg (20.6 lb.) final-save sample per 1,000 net tons of material
- **10-Car Composite** – 14.3 kg (28.6 lb.) final-save sample per 1,000 net tons of material

As-Received Mechanical Sampling System (AR)



The system's key components are as listed below and operate to meet or exceed ASTM standards when accepting a product of 50 mm x 0 (2 in. x 0) or less.



Primary Sampler - This cross-belt component (red) operates at a minimum 1.5 times the speed of Conveyor #1 (black) and extracts a 40 kg (80 lb.) increment every 65 seconds. The cutter opening width is 150 mm (6 in.) in width. Sample material is gravity-fed to the Primary Feeder Conveyor.

Primary Feeder Conveyor - This 300 mm (12 in.) wide, enclosed conveyor (light gray, short) travels at 0.04 m/s (9 fpm) to deliver sample material to the Crusher.

Hammer Mill Crusher - The Jeffrey-Rader 12ABE Crusher (blue) is comprised of a motor, a rotor with swinging hammers, a set of bars and a vibrating breaker plate to facilitate material flow. This component processes sample material to a top size of 10 mm (3/8 in.), which is gravity-fed through a chute to the Secondary Sampler.

Secondary Sampler - This cross-stream component (yellow) travels at a fixed speed of 0.4 m/s (15 ips). The cutter extracts an approximate 0.1 kg (0.2 lb.) increment every 10 seconds. The cutter opening is 75 mm (3.0 in.) in width. Increments are gravity-fed into a heavy-duty bag affixed to a collection chute.

Reject Conveyor - This 450 mm (18 in.) wide, hoop-and-cover conveyor (light gray, long) operates at 0.4 m/s (85 fpm). Material not retained for the final-save sample is deposited back to the main flow on Conveyor # 1.

Save Sample Ratio - The sampling system is designed to collect 14.8 kg (32.6 lb.) of saved-sample per 1,000 net tons of coal.

Additional Services

SAI offers additional services at the NSWT facility and the Ohio River region, directly or through our partnerships. Examples are: sampling system assessments and audits, truck auger sampling, temperature monitoring surveys, cargo inspections, and draft surveys.



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