

Sampling Associates International, LLC
Kinder Morgan Pier IX-X Terminal
Newport News, Virginia, U.S.A.



Kinder Morgan Pier IX Terminal (KMPIX)

Coal is delivered to the terminal via *CSX Rail Transportation* where it is unloaded by a dual-car rotary dumper. As coal travels on conveyors to customer-specific stockpiles, it can be sampled by the **As-Received Mechanical Sampling System** located on the C-3 conveyor which is 1800 mm (72 in.) in width. (Note: Material received at the terminal via vessels or barges offloaded by cranes from Pier X cannot be mechanically sampled at this time.)

When a vessel or barge arrives for loading, designated underground feeders are activated to allow stockpiled coal to flow onto a series of conveyors. As material travels to the vessel, it can be sampled by the **As-Shipped Mechanical Sampling System** or the **Mechanical Part-stream Sampler**, which are both located on the C-8 conveyor which is 2100 mm (84 in.) in width.

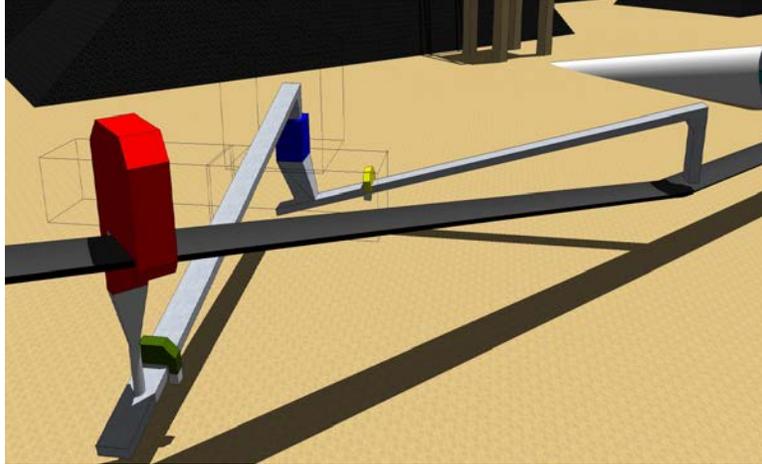
Both the As-Shipped and As-Received Mechanical Sampling Systems and Mechanical Part-stream Sampler were manufactured by **Precision Samplers Inc. (PSI)**. The As-Shipped and As-Received Mechanical Sampling Systems were installed in 2009. The Mechanical Part-stream Sampler was installed in 2013. The designs and operating programs for all sampling systems are 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 accepting a product of 75 mm x 0 (3 in. x 0) or less.



Primary Sampler - This cross-belt component (red) operates at a minimum 1.5 times the speed of the C-8 conveyor (black) as it extracts a 47.6 kg (105 lb.) increment every 35 seconds. The cutter opening is 233 mm (9.3 in.) wide. 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 help facilitate the flow of material.

Primary Feeder Conveyor - This 450 mm (18 in.) enclosed conveyor (gray, wide) operates at 0.2 m/s (38 fpm) as it delivers sample material passed the Size-Bulk Sampler to the Crusher.

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 3.6 kg (7.9 lb.) increment. The cutter is bi-directional in its operation by means of a dual-head cutter with each opening being 223 mm (8.9 in.) in width. Increments are gravity-fed into heavy duty-bags affixed to collection chutes.

Hammer Mill Crusher - The Jeffrey-Rader 34ABE Crusher (blue) is comprised of a motor, a rotor with fixed hammers and a set of 16 mm (5/8 in.) round-holed screens. A plugged-chute indicator and vibrator are installed at both the inlet and outlet chutes of this component 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 (gray, narrow) operates at 0.4 m/s (85 fpm). It transports 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 C-8 conveyor.

Secondary Sampler - This cross-belt component (yellow) operates at a minimum 1.5 times the speed of the Secondary / Reject Conveyor as it extracts a 0.2 kg (0.4 lb.) increment every 24 seconds. Component operation is bi-directional by means of a dual-head cutter with each cutter opening being 50 mm (2.0 in.) in width. Increments are gravity-fed into heavy-duty bags affixed to collection chutes.

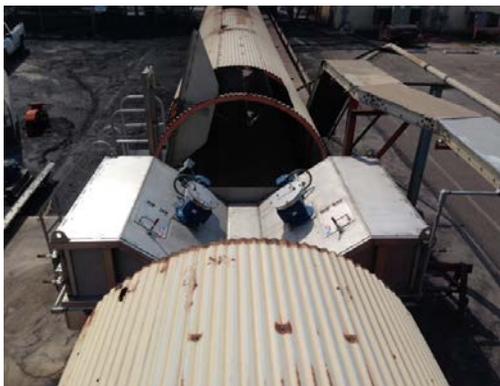
Save Sample Ratio - The sampling system is designed to collect 6.0 kg (12 lb.) of final-save sample per 1,000 net tons of coal.

Mechanical Part-stream Sampler (MPS)



The Mechanical Part-stream Sampler (MPS) is primarily an alternate mechanized sampling device that can be placed into service in the event the AS is inoperable. Having this back-up sampling device available eliminates the need for personnel to manual sample off the conveyor, and thus avoids potential safety hazards associated with that sampling method. The MPS can also be used in tandem with the AS to collect extra uncrushed sample material for a size analysis or other special test.

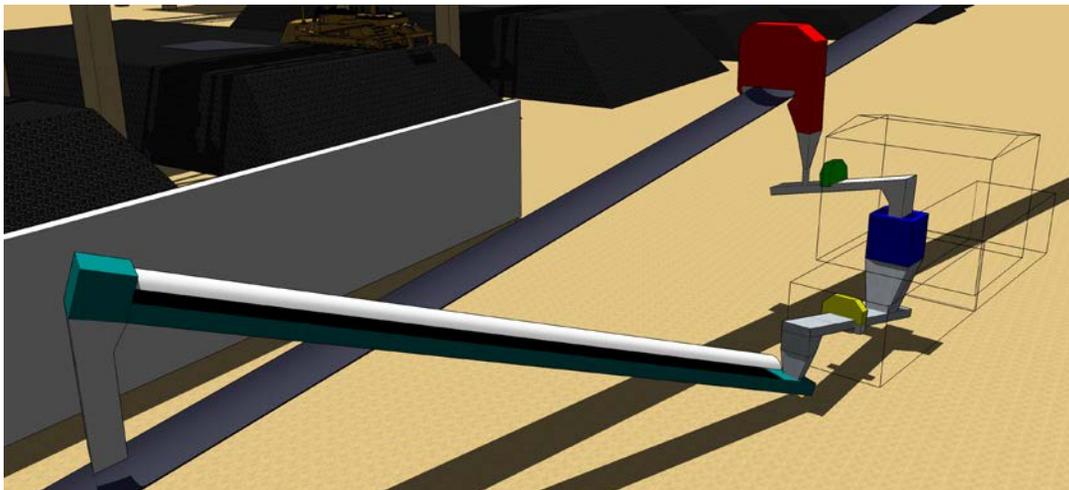
The collection equipment is comprised of two scoops (bottom, right), which normally are designed to operate in conjunction with one another. However, if one of the scoops fails the other scoop can continue to operate. Sample increments are gravity-fed through two independent collection tubes, located on opposite sides of each MPS, down to heavy-duty bags located at ground level. The increments are a minimum weight of 3.0 kg (6.9 lbs.) each, depending on the type of material and flow rate of the main conveyor. The sampling frequency is adjustable per the type of sampling required.



As-Received Mechanical Sampling System (AR)



The system's key components are listed below and operate to meet or exceed ASTM standards when accepting a product of 75 mm x 0 (3 in. x 0) or less. The sampling system can be tailored to operate at multiple belt speeds and cutter frequencies to accommodate special sample requests down to consignments of 1,000 tons.



Primary Sampler - This cross-belt component (red) operates at a minimum 1.5 times the speed of the C-3 conveyor (black), where it extracts a 50 kg (111 lb.) increment every 50 seconds. The cutter opening is 230 mm (9.2 in.) in width. A plugged-chute indicator and a vibrator are installed on the transfer chute of this component to facilitate material flow. Sample material is gravity-fed to the Primary Feeder Conveyor.

Primary Feeder Conveyor - This 450 mm (18 in.) wide, enclosed conveyor (dark gray) travels at 0.2 m/s (38 fpm) as it moves sample material passed the Size-Bulk Sampler to the Crusher.

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 3.6 kg (7.8 lb.) increment. The cutter is single-directional in its operation by means of a dual-head cutter with each opening being 223 mm (8.9 in.) in width. Increments are gravity-fed into heavy-duty bags affixed to collection chutes.

Hammer Mill Crusher - The Jeffrey-Rader 34ABE Crusher (blue) is comprised of a motor, a rotor with hammers and a set of 16 mm (3/4 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 Conveyor.

Secondary Conveyor - This 450 mm (18 in.) wide, enclosed conveyor (light gray) operates at 0.5 m/s (90.6 fpm) as it moves sample material toward and passed the Secondary Sampler.

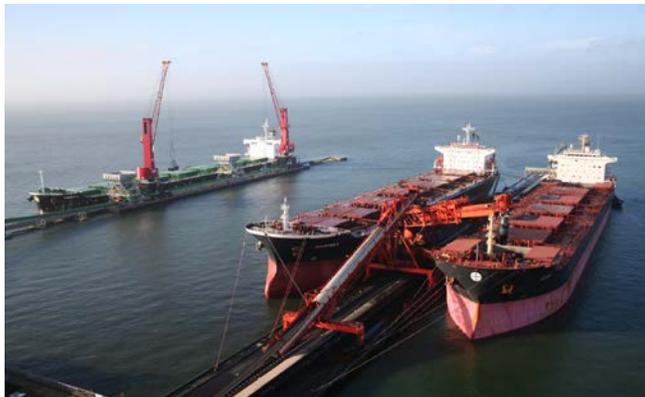
Secondary Sampler - This cross-belt component (yellow) operates at a minimum 1.5 times the speed of the Secondary Conveyor where it extracts a 0.1 kg (0.2 lb.) increment every 34 seconds. Component operation is bi-directional by means of a dual-head cutter with each opening being 50 mm (2.0 in.) in width. Increments are gravity-fed into heavy-duty bags affixed to collection chutes.

Reject Conveyor - This 450 mm (18 in.) hoop-and-cover conveyor (white) operates at 0.3 m/s (67.9 fpm). Material not retained for the final save sample is deposited back to the main flow on the C-3 conveyor.

Save Sample Ratio - The sampling system is designed to collect 3 kg (6 lb.) of final-save sample per 1,000 net tons of coal.

Additional Services

SAI offers additional services at the KMPHX facility and in the Hampton Roads region, either directly or through our partnerships. Examples are: sampling system assessments, truck auger sampling, temperature monitoring surveys, cargo inspections, and draft surveys.





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