NETL Life Cycle Inventory Data
Process Documentation File

Process Name: Coal Stockpile Stacker, 450 Tonnes, Construction

Reference Flow: 1 pcs of Coal Stockpile Stacker, 450 Tonnes

Brief Description: Based on advertised specifications for an Xstrata Rolleston coal stacker. Assumes stockpile stacker constructed entirely of steel plate, with negligible amounts of other materials.

Section I: Meta Data

Geographical Coverage: AUS **Region:** Queensland

Year Data Best Represents: 2006

Process Type: Manufacturing Process (MP)

Process Scope: Gate-to-Gate Process (GG)

Allocation Applied: No

Completeness: Individual Relevant Flows Recorded

Flows Aggregated in Data Set:

☒ Process ☐ Energy Use ☐ Energy P&D ☐ Material P&D

Relevant Output Flows Included in Data Set:

Releases to Air:	☐ Greenhouse Gases	☐ Criteria Air Pollutants	☐ Other
Releases to Water:	☐ Inorganic Emissions	☐ Organic Emissions	☐ Other
Water Usage:	☐ Water Consumption	☐ Water Demand (throughput)	
Releases to Soil:	☐ Inorganic Releases	☐ Organic Releases	☐ Other

Adjustable Process Parameters:

Tracked Input Flows:

Steel Plate, BF (85% Recovery Rate) [Metals]	*Steel plate from blast furnace (BF), assumes 85% recovered/recycled*

Tracked Output Flows:

Coal Stockpile Stacker, 450 Tonne [Construction]	*Construction of a single Xstrata Rolleston stockpile stacker*

Section II: Process Description

Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS_Stage1_C_Coal_Stockpile_Stacker_450_Tonnes_2010.01.xls*, which provides additional details regarding relevant calculations, data quality, and references.

Goal and Scope

The scope of this unit process covers the materials required for the construction of a single coal stockpile stacker needed to stockpile processed Illinois No. 6 bituminous coal on the mine site, until it is time for the coal to be loaded into railcars and transported to the energy conversion facility. The process is based on the reference flow of 1 piece of coal stockpile stacker, as described below and shown in **Figure 1.** The coal stockpile stacker is assumed to be constructed entirely of steel; other materials are assumed to be negligible. By default, all steel within this study was assumed to be steel plate, based on available GaBi profiles, unless other steel types were specified per available data, or a higher grade of steel would be required, per NETL engineering judgment. Therefore, all steel considered in this unit process was assumed to be steel plate.

This construction unit process for the coal stockpile stacker is combined with other pieces of equipment used during coal preparation on site, under Life Cycle (LC) Stage #1, in an individual assembly unit process, DS_Stage1_C_Assembly_I6_Coal_Prep_2010.01.xls. This assembly unit process quantifies the fraction of each piece of equipment needed under LC Stage #1 to produce 1 kg of Illinois No. 6 bituminous coal ready for transport (LC Stage #2) to the energy conversion facility (LC Stage #3).

Boundary and Description

Figure 1 provides an overview of the boundary of this unit process. Emissions related to the physical assembly of the coal stockpile stacker (e.g., emitted while putting together the components of the coal stockpile stacker, including transport of those components) are not considered in this study. Upstream emission from the production of raw materials used for the construction of the coal stockpile stacker (e.g., steel plate) are calculated outside the boundary of this unit process, based on proprietary profiles available in the GaBi model. As shown in Figure 1 and discussed above, the coal stockpile stacker constructed in this unit process is incorporated into the construction assembly for LC Stage #1.

The total weight of a coal stockpile stacker was readily available, but reliable data for the material breakdown of the stockpile stacker were not. The coal stockpile stacker is designed such that it can rotate 360°, but there is not information on the materials needed for such actions. Therefore, the stockpile

stacker was assumed to be composed solely of steel plate (Steel plate, BF (85% Recovery Rate) [Metals]).

Table 1 shows relevant properties and assumptions used to calculate the amount of steel plate contained in a single coal stockpile stacker. Total weight for one stockpile stacker was found to be approximately 450,000 kg (992,080 lbs) (Gay 2006). Based on the assumption that the stockpile stacker is constructed entirely out of steel plate, the total weight is assigned to this material. **Table 2** provides a summary of modeled input and output flows. Additional detail regarding input and output flows, including calculation methods, is contained in the associated DS.

Figure 1: Unit Process Scope and Boundary

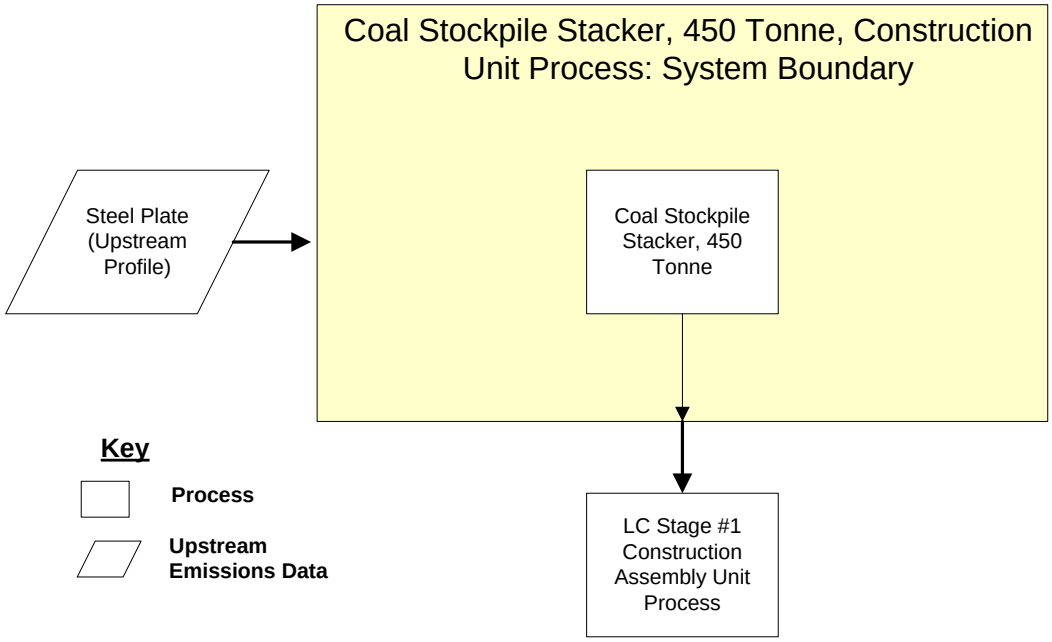

Table 1. General Properties

Property	Weight	Reference
Coal Stockpile Stacker Weight, kg (lbs)	450,000 (992,080)	Gay 2006
Total Steel Plate in One Coal Stockpile Stacker, kg (lbs)	450,000 (992,080)	NETL Engineering Judgment

Table 2: Unit Process Input and Output Flows

Flow Name*	Value	Units (Per Reference Flow)
Inputs		
Steel plate, BF (85% Recovery Rate) [Metals]	**450,000**	**kg**
Outputs		
Coal Stockpile Stacker, 450 Tonnes [Construction]	1	pcs

* **Bold face** clarifies that the value shown *does not* include upstream environmental flows. Upstream environmental flows were added during the modeling process using GaBi modeling software, as shown in Figure 1.

Embedded Unit Processes

None.

References

Gay 2006 Gay Construction. 2006. *Xstrata Rolleston Coal Stacker- Award Winning Design*. Gay Construction. http://www.gayconstructions.com/projects/projects/infrastructure/gcproject.2006-07-19.3975948791 (Accessed December 14, 2009).

Section III: Document Control Information

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