

Supply Base Report: Enviva Pellets Amory

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Completed in accordance with the Supply Base Report Template Version 1.2

For further information on the SBP Framework and to view the full set of documentation see www.sbp-cert.org

Document history

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1 Overview

Producer name: Enviva Holdings LP
Producer location: 7200 Wisconsin Ave Suite 1000 Bethesda, MD 20814
Geographic position: Amory, Mississippi
 N 33.988894, W-88.494950
Primary contact: Don Grant
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 Suite 1050 Raleigh, NC 27609
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Company website: <http://www.envivabiomass.com/>
Date report finalised: 18/Aug/2017
Close of last CB audit: 25/Aug/2017 Amory, Mississippi USA
Name of CB: SCS Global Services
Translations from English: NA
SBP Standard(s) used: Standard 2 version 1.0, Standard 4 version 1.0 and Standard 5 version 1.0
Weblink to Standard(s) used: <http://www.sustainablebiomasspartnership.org/documents>
SBP Endorsed Regional Risk Assessment: NA
Weblink to SBE on Company website: <http://envivabiomass.com/sustainability/wood-sourcing/sustainable-biomass-partnership>

Indicate how the current evaluation fits within the cycle of Supply Base Evaluations				
Main (Initial) Evaluation	First Surveillance	Second Surveillance	Third Surveillance	Fourth Surveillance
X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 Description of the Supply Base

2.1 General description

Enviva Holdings LP (“Enviva”) operates the Enviva Pellets Amory mill located in northeast Mississippi, USA. The supply base area for includes counties in Alabama (65), Arkansas (75), Florida (5), Georgia (66), Illinois (33), Indiana (9), Kentucky (48), Louisiana (64), Mississippi (82), Missouri (64), North Carolina (3), Oklahoma (5), Tennessee (85), and Texas (17) in the Southeast and Central United States of America. The supply base area contains 52.5 million hectares of forestland. The supply base area includes portions of 10 World Wildlife Fund® (WWF) ecoregions listed in Table 1.

Table 1. World Wildlife Fund Ecoregions in the Amory Supply Base Area

World Wildlife Fund Ecoregion	Percentage of supply base area
Appalachian mixed mesophytic forests	5.4%
Appalachian-Blue Ridge forests	4.2%
Central forest-grasslands transition	5.4%
Central U.S. hardwood forests	27.7%
Mississippi lowland forests	11.8%
Ozark Mountain forests	5.7%
Piney Woods forests	11.8%
Southeastern conifer forests	7.1%
Southeastern mixed forests	18.1%
Western Gulf coastal grasslands	2.9%

Forest cover-types and growth/drain ratios

Forest cover type in the Amory supply base area is 69% hardwood. The 31% pine portion is a combination of both naturally occurring and plantation pine (Table 2) (U.S. Department of Agriculture, 2018). Growth to drain is positive 1.94:1 for all species, 2.22:1 for pine species and 1.39:1 for hardwood species.

Table 2. Amory Supply Base Area by Forest Type and State (thousands forested hectares)

Forest type	AL	AR	FL	GA	IL	IN	KY	LA	MS	MO	NC	OK	TN	TX
White / red / jack pine group (100)	2.5	0.0	0.0	11.0	0.7	2.7	5.8	0.0	0.0	1.7	3.2	0.0	28.4	0.0
Spruce / fir group (120)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
Longleaf / slash pine group (140)	436.3	0.0	256.3	143.3	0.0	0.0	0.0	310.6	356.9	0.0	0.0	0.0	0.0	46.8
Loblolly / shortleaf pine group (160)	3,413.3	2,358.2	159.8	1,228.7	10.7	7.3	44.6	2,120.0	3,019.0	111.6	7.5	266.8	404.8	1,220.6
Other eastern softwoods group (170)	29.1	116.8	0.0	5.0	2.3	0.5	29.5	0.0	31.0	139.3	0.0	10.3	111.8	1.5
Pinyon / juniper group (180)	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exotic softwoods group (380)	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oak / pine group (400)	1,213.3	770.4	117.0	425.9	15.4	7.4	80.4	472.7	826.9	324.3	23.0	124.4	394.4	279.3
Oak / hickory group (500)	2,949.0	3,191.2	144.8	1,218.7	577.4	163.8	1,382.2	723.4	2,000.8	4,105.7	221.4	448.0	4,067.3	419.7
Oak / gum / cypress group (600)	828.5	814.6	112.4	310.1	17.5	8.6	32.8	1,588.6	1,018.2	37.0	0.0	27.8	131.8	329.2
Elm / ash / cottonwood group (700)	255.7	377.7	0.0	71.5	272.6	47.4	177.3	618.0	487.8	202.4	0.0	38.1	327.4	45.9
Maple / beech / birch group (800)	2.3	0.0	0.0	0.0	12.1	17.2	162.1	0.0	0.0	34.1	20.2	0.0	136.9	0.0
Other hardwoods group (960)	9.8	6.2	0.0	2.7	5.9	0.9	2.6	4.8	5.6	13.9	15.8	4.2	12.1	0.6
Exotic hardwoods group (990)	10.1	1.6	0.0	5.7	0.0	0.0	5.0	157.1	22.1	1.4	0.0	0.0	18.2	44.7
Nonstocked (999)	87.9	54.5	9.7	33.2	7.6	2.2	7.9	68.6	95.2	18.6	0.0	4.5	19.1	25.7

In the Gulf region of the U.S. south, total pine inventory has increased 2.1% annually since 2000 (Forest2Market Inc., 2015) (Figure 1). Reduced demand for hardwood pulpwood due to movement from hardwood paper demand have young hardwood pulpwood stands "aging out" into hardwood saw timber stands. Hardwood saw timber has demonstrates an annual increase of 1.3% since 2000 (Figure 2) (Forest2Market Inc., 2015). Annual hardwood pulpwood removals have declined by 2.6%, annual hardwood saw timber removals declined by 5% for the same time frame (Forest2Market Inc., 2015).

Figure 1. U.S. South Gulf Region Pine inventory 2000 – 2014

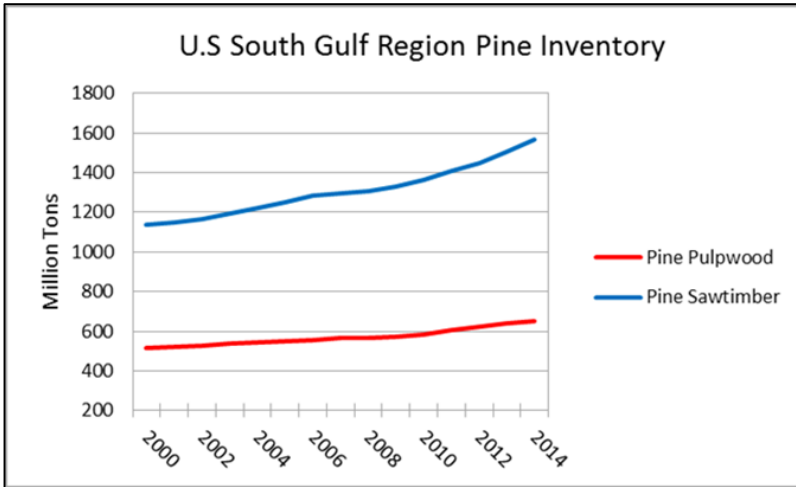
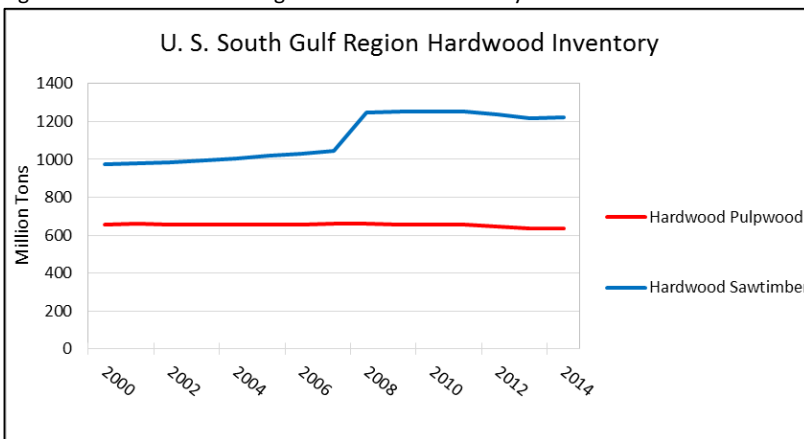


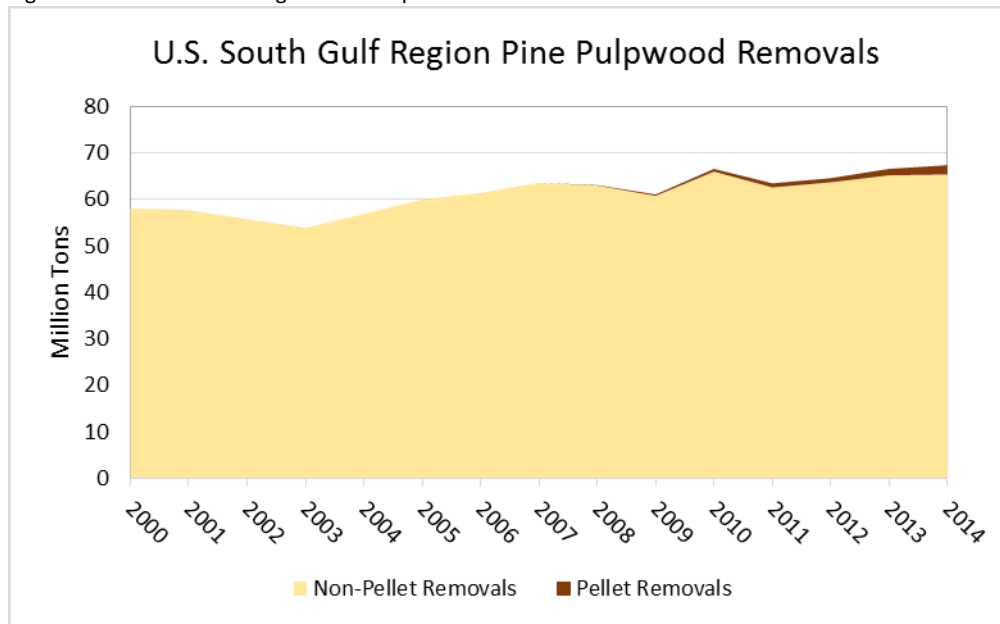
Figure 2. U. S. South Gulf Region Hardwood Inventory 2000 - 2014



Operating Scale

Low value forest product removals of both pine and hardwood for pellet export in the region comprised only 3.88% of total harvest volume during 2014 (Forest2Market Inc., 2015) (Figure 3). Primary harvesting activity and wood consumption in the southern US is driven by saw-timber markets with a total estimate of removals for the pellet industry comprising only 0.09% of the total pine inventory and 0.06% of the total hardwood inventory. In 2014, total wood consumption by all markets in the south accounted for 3.3% of total forest inventory (Forest2Market Inc., 2015). 85% of the feedstock at AMO is obtained as secondary sources from sawmills. Sawmills purchase high-quality timber that is used for purposes such as products such as furniture and construction, and they produce residues as a by-product of their operations.

Figure 3. U.S. South Gulf Region Pine Pulpwood Removals 2000 – 2014.



CITES, IUCN Species

The International Union for the Conservation of Nature (IUCN) species list includes *Pinus palustris* (Longleaf pine), which does occur in the supply base region (International Union for the Conservation of Nature, 2015). Longleaf pine is included in the IUCN list because its current extent is much reduced from its historical dominance in the southeast US. However, conservation groups, such as the Longleaf Alliance, agree that creating commercial viability of longleaf pine is crucial to its restoration (Longleaf Alliance, 2016). Enviva’s use of material from longleaf stand thinning’s or other harvest residuals supports the commercial viability of the species and encourages landowners to restore longleaf stands. Enviva does not source from natural longleaf stands that are being converted to another forest type.

Further, Enviva maintains a third party certified Controlled Wood Risk Assessment/Due Diligence System which satisfies the Forest Stewardship Council® (FSC®), Programme for the Endorsement of Forest Certification™ (PEFC™) and Sustainable Forestry Initiative® (SFI®) Chain of Custody requirements. These certifications address the controls needed to avoid the use of CITES and/or IUCN species concerns. None of the species converted to wood pellets at the Amory facility appear in the Convention on International Trade in Endangered Species (CITES) Appendices (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 2015).

General Forest Management Techniques

General forest management practices vary by landowner and location within the supply base and are conducted on both pine and hardwood sites. Typically, hardwood management relies on natural regeneration of stands where forest tracts are harvested and the natural processes of seedling establishment and sprout growth from the remaining stumps (called “coppice”) produce the next forest, and little management takes place until the next harvest. Pine stands can be naturally regenerated or planted after harvest. Planted pine management includes various regimes designed to produce a variety of forest products. Typical management scenarios include a thinning between age 10 and 15, and a final harvest occurring between age 25 and 35. Pine management intensity depends on landowner objectives and resources, and could include additional treatments, and/or additional thinning. Overall, though many pine stands are “planted” they are not intensively managed plantations with little or no understory; instead, once established they are left to grow and routinely have a hardwood dominated understory.

Ownership, Land Use and Certification

Forest ownership patterns within the supply base are typical for the southern US, with the highest percentage of the forest owned by private landowners (85.7%). Based on data obtained from the United States Forest Service Forest Inventory and Analysis program, forest land ownership categories for each state in the supply base are presented in Table 3 (U.S. Department of Agriculture, 2018). The majority land use in the supply base area is agriculture or forestry and is presented in Table 4 (US Department of Agriculture Economic Research Service, 2007).

Table 3. Amory SBP-compliant Supply Base Area by State and Ownership (thousands forested hectares)

	Federal	State	Local	Private	Total
AL	410.9	127.7	57.7	8641.5	9237.8
AR	1283.5	184.2	28.1	6203.2	7698.9
FL	177.7	133.9	0.6	487.7	799.9
GA	231.1	66.1	64.6	3094.1	3455.8
IL	138.3	48.9	14.3	720.8	922.3
IN	29.1	12.9	3.1	213.1	258.2
KY	245.6	38.4	7.1	1639.1	1930.2
LA	422.8	251.0	90.4	5299.7	6063.8
MS	679.7	89.8	98.6	6995.2	7863.4
MO	735.4	259.1	14.6	3980.9	4990.0
NC	173.4	2.5	0.0	117.6	293.4
OK	187.5	17.8	9.4	709.3	924.0
TN	569.1	325.4	44.7	4713.1	5652.3
TX	201.5	15.0	5.4	2192.0	2413.9

Table 4. Land Use by State (State-wide Basis)

	Cropland	Pasture	Forest	Urban	Other
AL	10%	8%	69%	4%	9%
AR	25%	10%	42%	2%	21%
FL	8%	16%	45%	12%	19%
GA	12%	3%	66%	7%	12%
IL	68%	5%	12%	1%	14%
IN	56%	7%	20%	5%	12%
KY	30%	14%	46%	3%	7%
LA	16%	7%	50%	4%	23%
MS	19%	7%	65%	2%	7%
MO	37%	19%	34%	3%	7%
NC	16%	4%	57%	6%	17%
OK	20%	61%	10%	3%	6%
TN	23%	8%	53%	6%	10%
TX	29%	43%	17%	2%	9%

Regional Socio-economic Conditions

Annually the forest products industry in Mississippi generates over \$11 billion in revenue impacts. In 2014 over 59,000 people were employed in forestry in Mississippi earning over \$2.7 billion in wages (Mississippi Institute for Forest Inventory, 2015). The mean hourly wage for the farming, fishing and forestry occupational group in southeast Mississippi in 2014 was \$14.13, compared to the United States average of \$12.09 for this same group (US Department of Labor, 2015). Forestry related industries are a leading economic driver in many Mississippi counties, providing employment opportunities for loggers, foresters, consultants, truck drivers and mill workers. Enviva Amory provides opportunities for local residents to gain employment and currently directly

employs approximately 25 people. As part of feedstock procurement, pellet manufacturing, and pellet transport, Enviva Amory creates numerous spin-off jobs in the region.

According to a recent study, 50 indirect jobs in the region are created by Enviva's operations. Further, employees at the Enviva Amory plant, on average, earn wages that are 12% higher than other comparable jobs in the area. The same study found that Enviva Amory has a total direct and indirect economic contribution to the region of over \$32 million dollars (Chmura Economics and Analytics, 2016).

Pellet Feedstock Profile

The Amory mill uses feedstocks that originate from three basic sources. Primary feedstock originating directly from the forest in the form of in-woods chips, and secondary feedstock is received from two types of wood processing facilities; primary wood processors and wood industry processors.

Primary feedstock

Primary feedstock arrives at the Amory mill delivered directly for forest settings. The wood is from pine plantation management operations called thinning's. A thinning is an intermediary harvest designed to remove poorer performing trees from the plantation to make sure the site nutrients are available for the remaining trees to improve growth and health. This feedstock originates from lands certified to an SBP approved forest management system. Since feedstocks originating from SBP approved forest management systems are SBP-compliant without the requirement of a supply base evaluation, Amory's certified primary feedstock is considered SBP-compliant.

Secondary feedstock

Secondary feedstock is used at Enviva's Amory Pellet mill and is provided by two distinctly different sources; Primary wood processing facilities and Wood industry manufacturing facilities.

Secondary feedstock is provided from primary wood processing facilities that purchase logs from the forest and convert them into boards and other lumber products for higher end use. Amory purchases the saw dust, chips, shavings and other waste stream products from this type of facility make wood pellets. This waste stream is best used in wood pelleting rather than going into landfills. Enviva's District of Origin process, local presence, expertise and knowledge of the region ensures the supply area and necessary attributes of the primary wood processing sources supplying the Amory facility are known and their supply areas mapped within Amory's supply base area. A significant portion of this feedstock type comes from suppliers with certified chain of custodies and is delivered as certified secondary feedstock. This certified feedstock comes from lands that are certified to forest management schemes recognized by SBP as approved forest management systems. Since feedstocks originating from SBP approved forest management systems are SBP-compliant without the requirement of a supply base evaluation, Amory's certified secondary feedstock is considered SBP-compliant.

Amory also purchases a small amount secondary feedstock from wood industry manufacturing facilities. Wood industry manufacturers purchase hardwood lumber from regional saw mills to convert into furniture, trim and other higher end use products. As with primary wood processing the waste stream is ideal feedstock to use in wood pellet production rather than going into landfills.

Enviva knows the location of its secondary feedstock suppliers but these supply systems can be complex. Legality of feedstock is easily proven because of the strong rule of law that exists in the United States (The World Bank Group, 2018), Enviva's contractual requirement all suppliers abide by all applicable laws and regulations and Enviva's Program for the Endorsement of Forest Certification™ (PEFC) Due Diligence System. The barriers to secondary supplier's feedstock systems against all of the sustainability criteria in onerous. An SBP approved regional risk assessment in the United States to ensure the wood can be considered sustainably sourced and therefore SBP-compliant is the best path forward.

Enviva's Amory mill does not have a large primary supplier base which inhibits its visibility to on the ground practices. This creates difficulties proving low risk for the sustainability indicators of a supply base evaluation. Enviva purchase its uncertified secondary feedstock as SBP-controlled feedstock under its PEFC Chain of Custody and associated Due Diligence System as SBP-controlled feedstock.

SBP does not require a supply base evaluation for SBP-compliant feedstocks sourced from approved forest management scheme or SBP-controlled feedstocks sourced through a Biomass Producers chain of custody system. Therefore this report does not include a supply base evaluation.

Enviva's Commitment to Responsible Wood Sourcing

Enviva purchases sawmill and wood industry residues in the form of sawdust, shavings, or other waste products from the milling process (Figure 4). Secondary feedstock suppliers receive an initial visit prior to beginning deliveries, to verify their operations and products. Annually, sawmills and wood industry suppliers complete a District of Origin Residual Supplier Reporting Form, providing Enviva with information on the source of their wood any certifications they hold, species used at the mill and other attributes of their supply system. Enviva ensures each secondary feedstock supplier supply areas is within in Amory's supply base area to conform to PEFC chain of custody requirements.

The system Enviva uses to approve secondary feedstock primary processing mills as described above meets the requirements described in SBP's Normative Interpretations Document dated December 2017. The guidance found in Standard 2 Section 8.4 describes the procedures a Biomass Producer may use to ensure certified secondary feedstock sources can be proven SBP-compliant and as a best practice to manage all secondary feedstock supplier information..

This approach is also in alignment with SBP Guidance Document: Meeting SBP Criteria in relation to protecting exceptional conservation values in the southern US. The process Enviva employ's through its District of Origin Process and annual Residual Supplier Data Request process ensures Enviva can meet and exceed the guidance provided in the document therefore providing conformance to SBP Standard 1 Feedstock Compliance Standard indicators 2.1.1 and 2.1.2 and confirming low risk. As with the guidance document, Enviva is not required to use this guidance for SBP-controlled feedstocks it feels it is a Best Practice to manage secondary supplier information.

2.2 Actions taken to promote certification amongst feedstock supplier

Enviva is third party certified in the three major chain of custody systems (FSC, PEFC & SFI) and approximately 40% of Amory's feedstock supply comes from lands that are certified to an SBP approved forest management system. Enviva also maintains certification under the SFI Fiber Sourcing Program. SFI Fiber Sourcing requires Enviva to promote sustainable forestry activities and forest certification to our suppliers and landowners. Enviva encourages secondary feedstock suppliers to consider chain of custody certification as a means to further supply chain transparency.

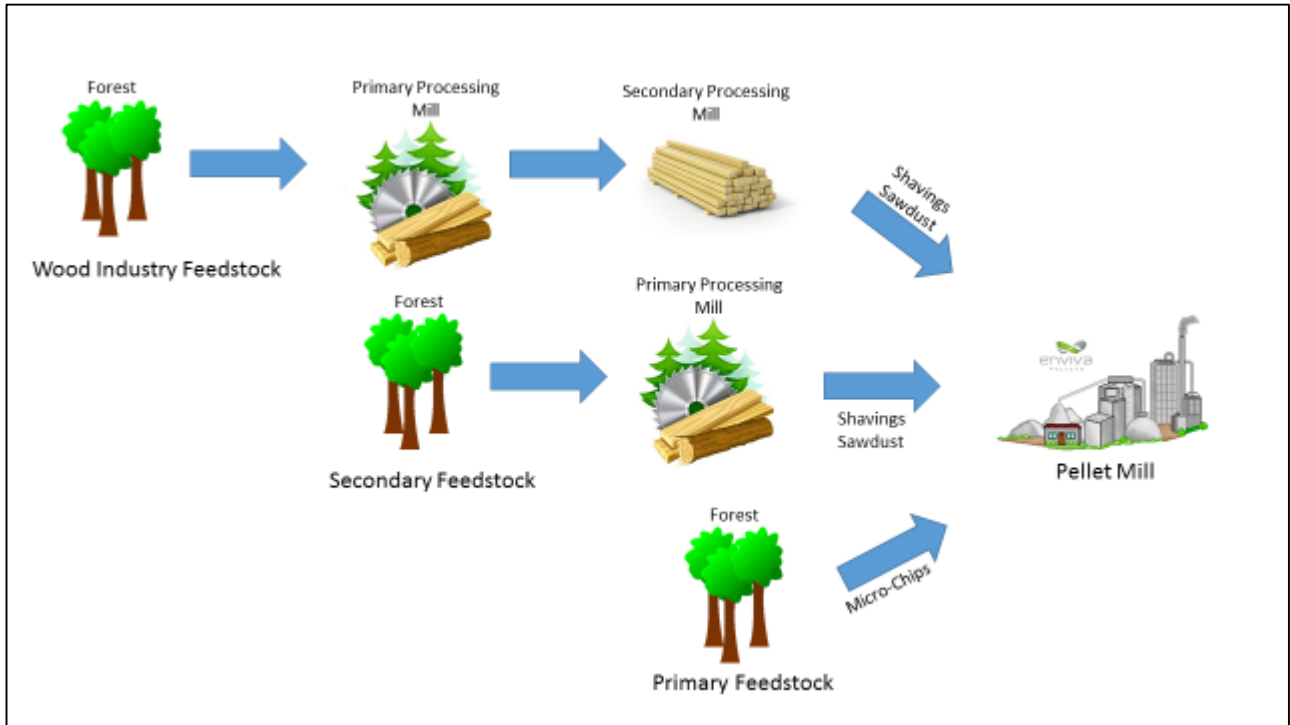
Enviva actively pursues feedstock from certified sources to encourage those landowners to maintain and expand their certified holdings. Enviva foresters are active in the Mississippi Forestry Association and the Mississippi committee of the American Tree Farm System®, both of which promote forest sustainability and certification.

2.3 Final harvest sampling programme

All of the primary feedstock used at Enviva's Amory mill comes from pine plantation thinning's. The requirement for a final harvest sampling program does not apply.

2.4 Flow diagram of feedstock inputs showing feedstock type [optional]

Figure 4. Feedstock Flow Chart



2.5 Quantification of the Supply Base

Supply Base

- a. Total Supply Base area (ha): 52,504,045 forested hectares
- b. Tenure by type (ha):

	Federal	State	Local	Private	Total
AL	410.9	127.7	57.7	8641.5	9237.8
AR	1283.5	184.2	28.1	6203.2	7698.9
FL	177.7	133.9	0.6	487.7	799.9
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MS	679.7	89.8	98.6	6995.2	7863.4
MO	735.4	259.1	14.6	3980.9	4990.0
NC	173.4	2.5	0.0	117.6	293.4
OK	187.5	17.8	9.4	709.3	924.0
TN	569.1	325.4	44.7	4713.1	5652.3
TX	201.5	15.0	5.4	2192.0	2413.9

- c. Forest by type (ha): Temperate forest type
- d. Forest by management type (ha):
 - Natural forest 74%
 - Plantation 26%

- e. Certified forest by scheme (ha) (State-wide basis)

	FSC	SFI	ATFS
AL	670,919	2,944,878	2,462,304
AR	1,356,171	3,199,995	559,518
FL	126,404	1,879,588	1,082,355
GA	81,601	2,419,141	1,924,197
IL	1,754	0	0
IN	670,717	157,804	0
KY	241,754	95,665	245,625
LA	619,974	2,962,742	1,052,129
MS	250,868	2,104,972	1,320,647
MO	238	0	127,563
NC	190,974	1,097,424	406,418
OK	11,072	783,900	22,714
TN	100,436	475,216	340,879
TX	163,479	2,391,417	788,625

f.

Feedstock

- g. Total volume of Feedstock: 220,061 metric tonnes
- h. Volume of primary feedstock: 33,127 metric tonnes

- i. List percentage of primary feedstock (g), by the following categories. Subdivide by SBP-approved Forest Management Schemes:
 - Program for the Endorsement of Forest Certifications: 100.0%
 - Not certified to an SBP-approved Forest Management Scheme: 0%
- j. List all species in primary feedstock, including scientific name
Loblolly pine (*Pinus taeda*)
- k. Volume of primary feedstock from primary forest: 0.0 metric tonnes
- l. List percentage of primary feedstock from primary forest (j), by the following categories. Subdivide by SBP-approved Forest Management Schemes:
 - Primary feedstock from primary forest certified to an SBP-approved Forest Management Scheme: 0.0
 - Primary feedstock from primary forest not certified to an SBP-approved Forest Management Scheme: 0.0
- m. Volume of secondary feedstock: 85% of the total feedstock, 47% of the total are pine species.
- n. Volume of tertiary feedstock: 0%.

3 Requirement for a Supply Base Evaluation

SBE completed	SBE not completed
<input type="checkbox"/>	X

4 Supply Base Evaluation

4.1 Scope

NA

4.2 Justification

NA

4.3 Results of Risk Assessment

NA

4.4 Results of Supplier Verification Programme

NA

4.5 Conclusion

NA

5 Supply Base Evaluation Process

NA

6 Stakeholder Consultation

NA

6.1 Response to stakeholder comments

NA

7 Overview of Initial Assessment of Risk

NA

8 Supplier Verification Programme

8.1 Description of the Supplier Verification Programme

NA

8.2 Site visits

NA

8.3 Conclusions from the Supplier Verification Programme

NA

9 Mitigation Measures

9.1 Mitigation measures

NA

9.2 Monitoring and outcomes

NA

10 Detailed Findings for Indicators

NA

11 Review of Report

11.1 Peer review

NA

11.2 Public or additional reviews

Enviva maintains a third party certified SFI Fiber Sourcing Program and FSC/PEFC/SFI Chain of Custody systems. All of these programs are reviewed internally and by our third party certifying bodies on an annual basis.

12 Approval of Report

Approval of Supply Base Report by senior management			
Report Prepared by:	<i>Don Grant</i>	<i>Manager, Sustainability Standards</i>	<i>8/15/2017</i>
	Name	Title	Date
The undersigned persons confirm that I/we are members of the organisation’s senior management and do hereby affirm that the contents of this evaluation report were duly acknowledged by senior management as being accurate prior to approval and finalisation of the report.			
Report approved by:	<i>Jennifer Jenkins</i>	<i>Vice President and Chief Sustainability Officer</i>	<i>8/17/2017</i>
	Name	Title	Date
Report approved by:	<i>Thomas Meth</i>	<i>Executive Vice President for Sales and Marketing</i>	<i>8/18/2017</i>
	Name	Title	Date
Report approved by:			
	Name	Title	Date

13 Updates

13.1 Significant changes in the Supply Base

NA

13.2 Effectiveness of previous mitigation measures

NA

13.3 New risk ratings and mitigation measures

NA

13.4 Actual figures for feedstock over the previous 12 months

Feedstock

- f. Total volume of Feedstock: 220,061 metric tonnes
- g. Volume of primary feedstock: 33,127 metric tonnes
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- i. List all species in primary feedstock, including scientific name
Loblolly pine (*Pinus taeda*)
- j. Volume of primary feedstock from primary forest: 0.0 metric tonnes
- k. List percentage of primary feedstock from primary forest (j), by the following categories. Subdivide by SBP-approved Forest Management Schemes:
 - a. Primary feedstock from primary forest certified to an SBP-approved Forest Management Scheme: 0.0
 - b. Primary feedstock from primary forest not certified to an SBP-approved Forest Management Scheme: 0.0
- l. Volume of secondary feedstock: 85% of the total feedstock, 47% of the total are pine species.
- m. Volume of tertiary feedstock: 0%.

13.5 Projected figures for feedstock over the next 12

Feedstock

- f. Total volume of Feedstock: 220,061 metric tonnes
- g. Volume of primary feedstock: 33,127 metric tonnes

- h. List percentage of primary feedstock (g), by the following categories. Subdivide by SBP-approved Forest Management Schemes:
 - a. Program for the Endorsement of Forest Certifications: 100.0%
 - b. Not certified to an SBP-approved Forest Management Scheme: 0%
- i. List all species in primary feedstock, including scientific name
Loblolly pine (*Pinus taeda*)
- j. Volume of primary feedstock from primary forest: 0.0 metric tonnes
- k. List percentage of primary feedstock from primary forest (j), by the following categories. Subdivide by SBP-approved Forest Management Schemes:
 - a. Primary feedstock from primary forest certified to an SBP-approved Forest Management Scheme: 0.0
 - b. Primary feedstock from primary forest not certified to an SBP-approved Forest Management Scheme: 0.0
- l. Volume of secondary feedstock: 85% of the total feedstock, 47% of the total are pine species.
- m. Volume of tertiary feedstock: 0%.

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