

APPENDIX L

Outline of Water Use Analysis Process

Demand Side Analysis

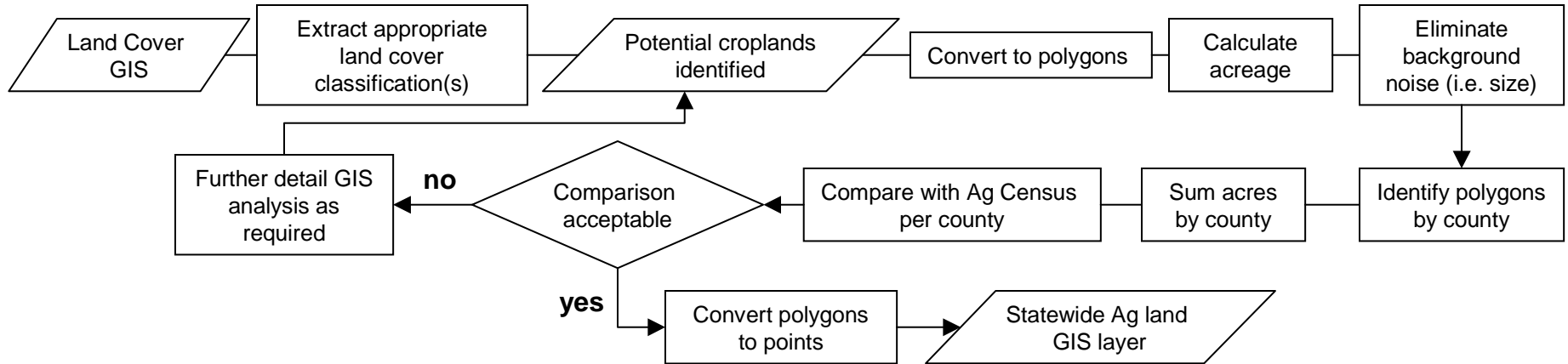
- I. Objective: To estimate the total water use of key water use sectors in present and future conditions.
- II. Water Use Analysis Matrix
- III. Workflow diagrams for each Water Use Sector
 - A. List of Water Use Sectors
 1. Agriculture
 - a. Irrigated croplands
 - b. Livestock
 2. Public Water Supply (PWS)
 - a. Residential
 - b. Non-residential
 1. Commercial
 2. Industry
 3. Self-Supplied
 - a. Residential
 - b. Non-residential
 1. Commercial
 2. Industry
- IV. Basic Process
 - A. Locate the features statewide using available sources to create a GIS layer. (Step a. in workflow diagrams)
 - B. Develop a table of water use factors based on best available information. (Step b. in workflow diagrams)
 - C. Build a model to assign proper water use factor to Step a. (Step c. in workflow diagrams)
 - D. Export data from step c into WUDS format table for completion on screening input file.

Water Use Analysis Matrix

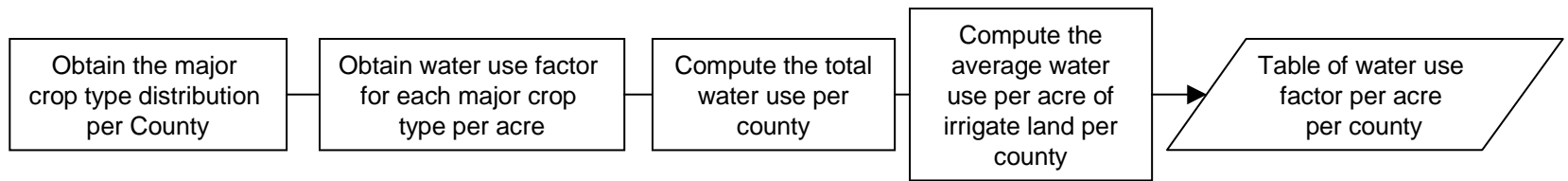
Sector	Subsector	Present		Future		Results	
		Data Source	Analysis	Data Source	Analysis		
Ag	Irrigated	<ul style="list-style-type: none"> Land Cover GIS USDA (2002 Ag. Census per County, check if an Ag GIS exists) Registration CDM water use factors 	<ul style="list-style-type: none"> Create a GIS layer of irrigated acres using the Land Use GIS to spatially distribute Ag Census data by major crop type per county. Multiply GIS features by water use factors used in pilot project Use Reg. data for integration and/or calibration of GIS layer 	<ul style="list-style-type: none"> GIS layer of present water use for irrigated acres USDA Mid Atlantic Report (used in pilot project) or Ag Census 	<ul style="list-style-type: none"> Develop trend analysis per county based on historical Ag Census or Apply est. constant growth of approx. 0.36% (USDA) per year statewide to present GIS layer as used in pilot project. Note, this assumption will over generalize growth at the local level (pour points). 	Export GIS attribute table into a (x,y) water use) WUDS database for integration with Screening Tool	
	Livestock	<ul style="list-style-type: none"> Land Cover GIS USDA (2002 Ag Census) CAFO (?), Nutrient Management Plan (?) Reg. data (incomplete) CDM water use factors 	<ul style="list-style-type: none"> Same analysis as irrigated to create a GIS layer, unless other related data is available in spatial format. Multiply GIS features by water use factors used in pilot project. Use Reg. data for integration and/or calibration of GIS layer 	<ul style="list-style-type: none"> GIS layer of present water use of livestock and poultry USDA Mid Atlantic Report (used in pilot project) or Ag Census 	<ul style="list-style-type: none"> Develop trend per county based on historical Ag Census or Apply national trend estimates by the USDA to GIS layer of present data (CDM method). Note, this assumption will over generalized growth at the local level (pour points). 		
PWS	Residential	<ul style="list-style-type: none"> Registration AWSR 	<ul style="list-style-type: none"> Create a GIS layer of reported PWS sources using Reg. data and AWSR 	<ul style="list-style-type: none"> PWS Service Area Map Population Projections per Municipality 	<ul style="list-style-type: none"> Create a GIS layer of total households within each PWS service areas and derive a factor of water use per household for each PWS and apply the factor to household projections for each county Spatially join the household projections to the PWS layer (assumes no new PWS sources) 		
	Non-residential (Commercial & Industry)			<ul style="list-style-type: none"> Labor & Industry (L & I) Workforce Investment Areas (WIA) 	<ul style="list-style-type: none"> Create a GIS layer of total employment within each PWS service areas and derive a factor of water use per employee for each PWS and apply the factor to employment projections for each county within a given WIA. Spatially join the employment projections to the PWS layer (assumes no new PWS sources) 		
Self-Supplied	Residential	<ul style="list-style-type: none"> 2000 Census PWS Service Area Map 	<ul style="list-style-type: none"> Create a GIS layer of total households outside each PWS service areas and apply a pre-determined regional water use factor (to include consumptive use ratio). 	<ul style="list-style-type: none"> PWS Service Area Map Population Projections per Municipality 	<ul style="list-style-type: none"> Use GIS layer of total households outside the PWS service areas and distribute projected population for each county and apply a regional water use factor to total households 		
	Non-residential	Comm.	<ul style="list-style-type: none"> Registration or L & I, PWS Service Areas, & AWSR 	<ul style="list-style-type: none"> Create a GIS layer from Registration data using a pre-determined regional water use factor (to include consumptive use ratio). or Use number of employees from L & I data (CDM method) 	<ul style="list-style-type: none"> Labor & Industry (L & I) Workforce Investment Areas (WIA) 		<ul style="list-style-type: none"> Use the GIS layer of present data and apply the factor of employment projections for each county within a given WIA sector and pre-determined regional water use factor.
		Industry	<ul style="list-style-type: none"> Registration or L & I, PWS Service Areas, & AWSR 	<ul style="list-style-type: none"> Create a GIS layer from Registration data using a pre-determined regional water use factor (to include consumptive use ratio). or Use number of employees from L & I data (CDM method) 	<ul style="list-style-type: none"> Labor & Industry (L & I) Workforce Investment Areas (WIA) 		<ul style="list-style-type: none"> Use the GIS layer of present data and apply the factor of employment projections for each county within a given WIA sector and pre-determined regional water use factor.
Mining	<ul style="list-style-type: none"> Registration Data 	<ul style="list-style-type: none"> Create a GIS layer of reported Mining sites Use selected Mining & Recl. data for calibration 	<ul style="list-style-type: none"> No Data 	<ul style="list-style-type: none"> No projection or apply a factor to max out existing capacity 			
Hydroelectric	<ul style="list-style-type: none"> Registration Data 	<ul style="list-style-type: none"> Create a GIS layer from registrations 	<ul style="list-style-type: none"> No Data 	<ul style="list-style-type: none"> No projection 			
Thermoelectric	<ul style="list-style-type: none"> Registration Data 	<ul style="list-style-type: none"> Create a GIS layer from registrations 	<ul style="list-style-type: none"> Registration Data Dept. of Energy 	<ul style="list-style-type: none"> Max out existing capacity 			

1a. Irrigated Croplands (Present)

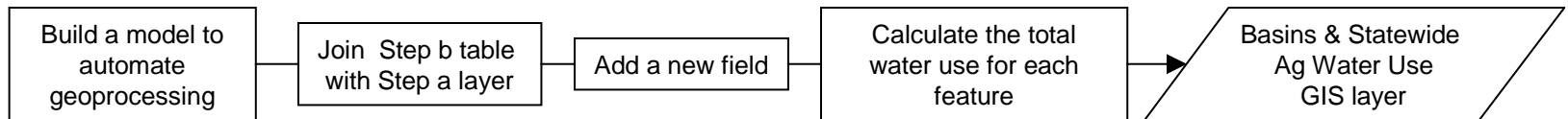
Step a.



Step b.

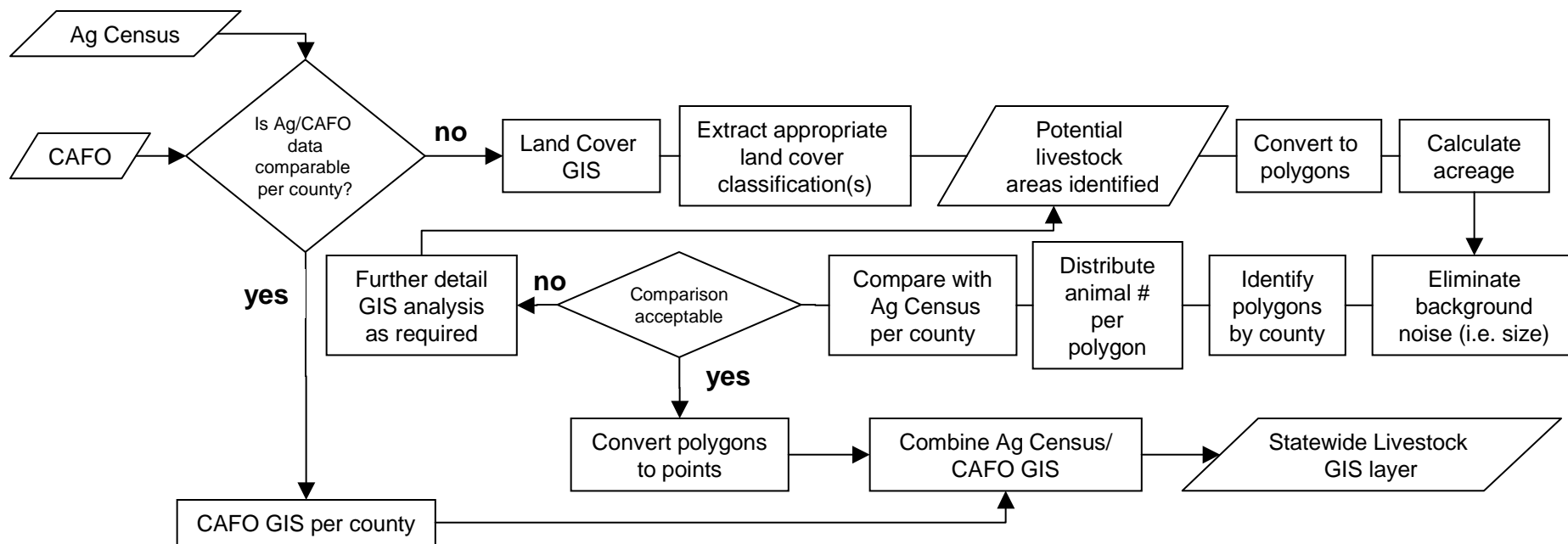


Step c.

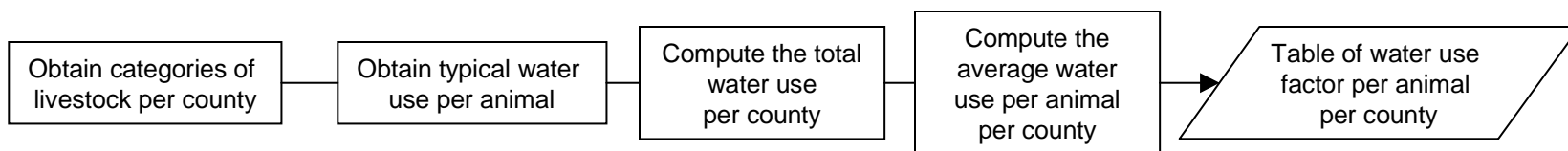


1b. Livestock (Present)

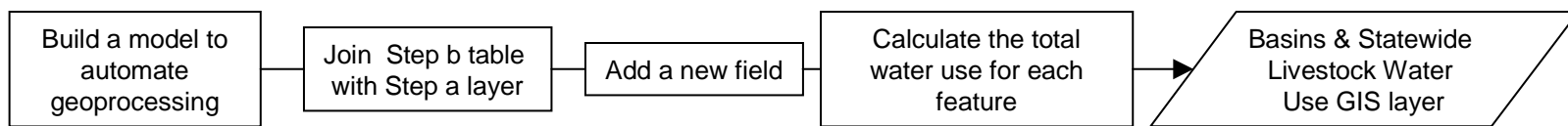
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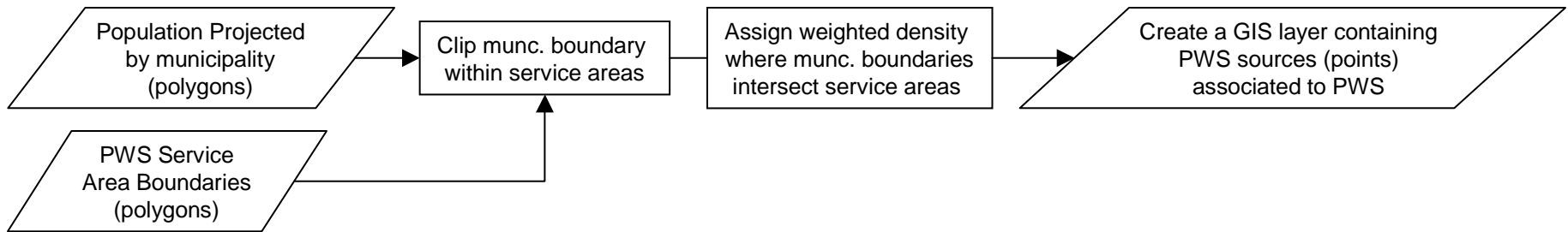


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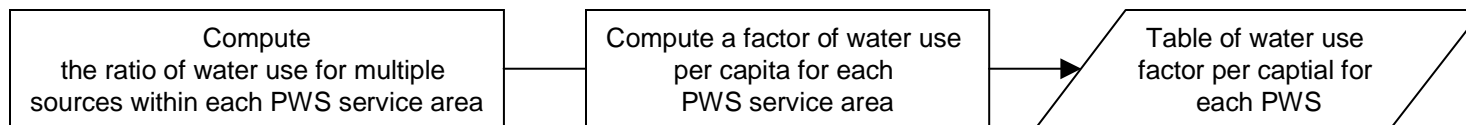


2a. PWS - Residential (Future)

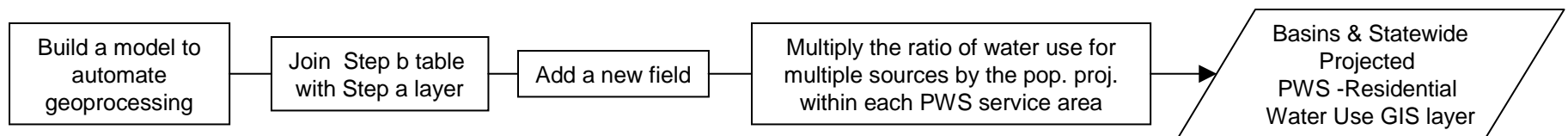
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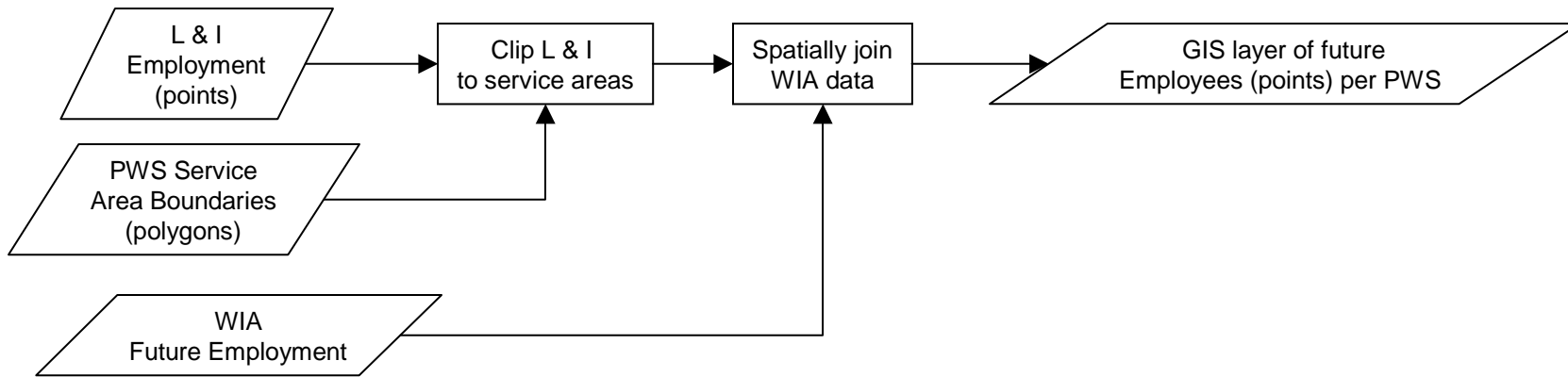


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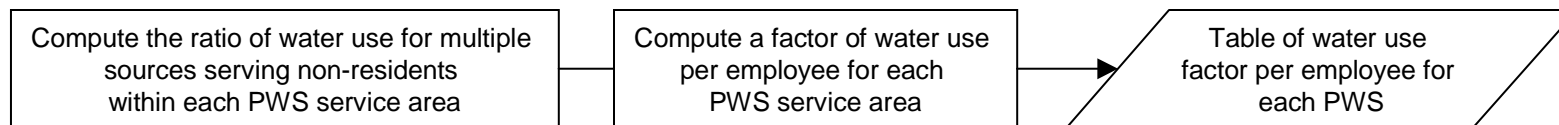


2b. PWS - Non-residential (Future)

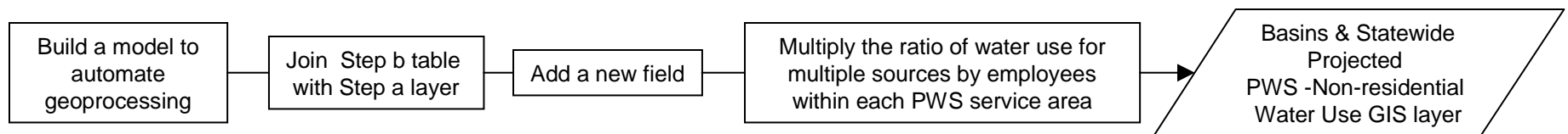
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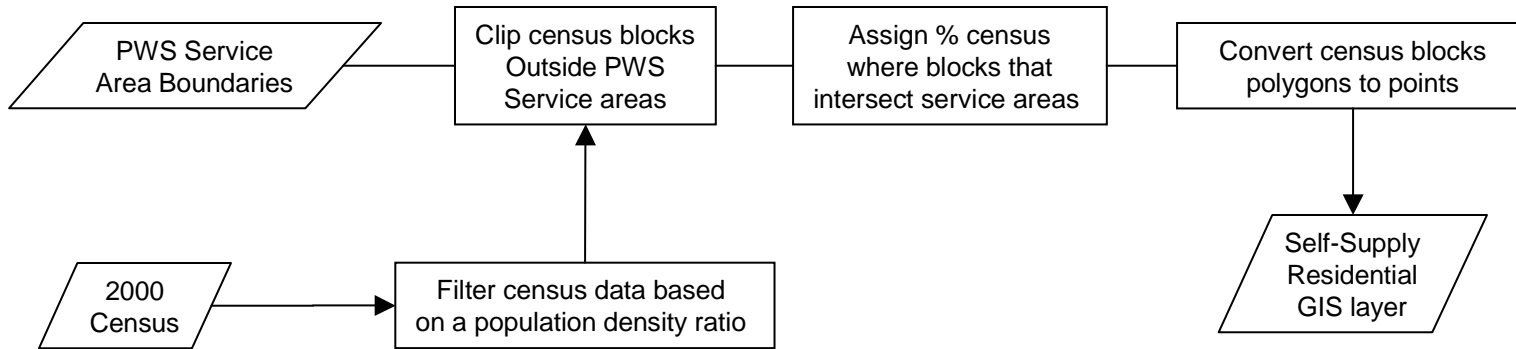


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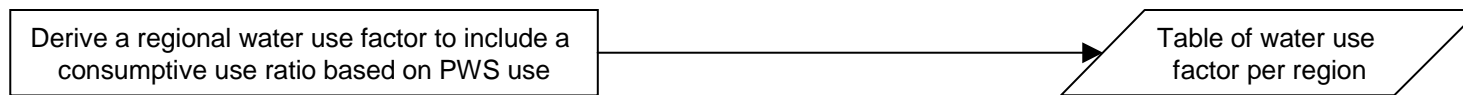


3a. Self-Supplied - Residential (Present)

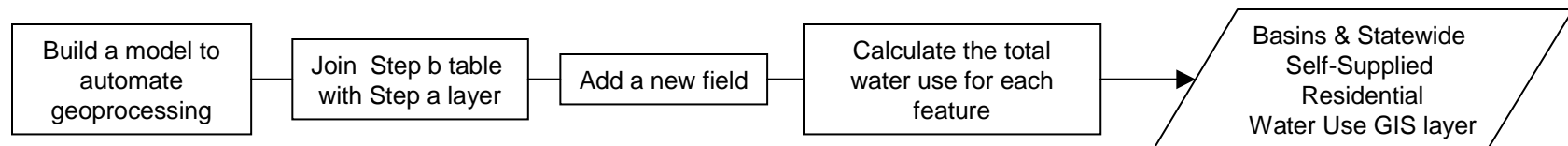
Step a.



Step b.

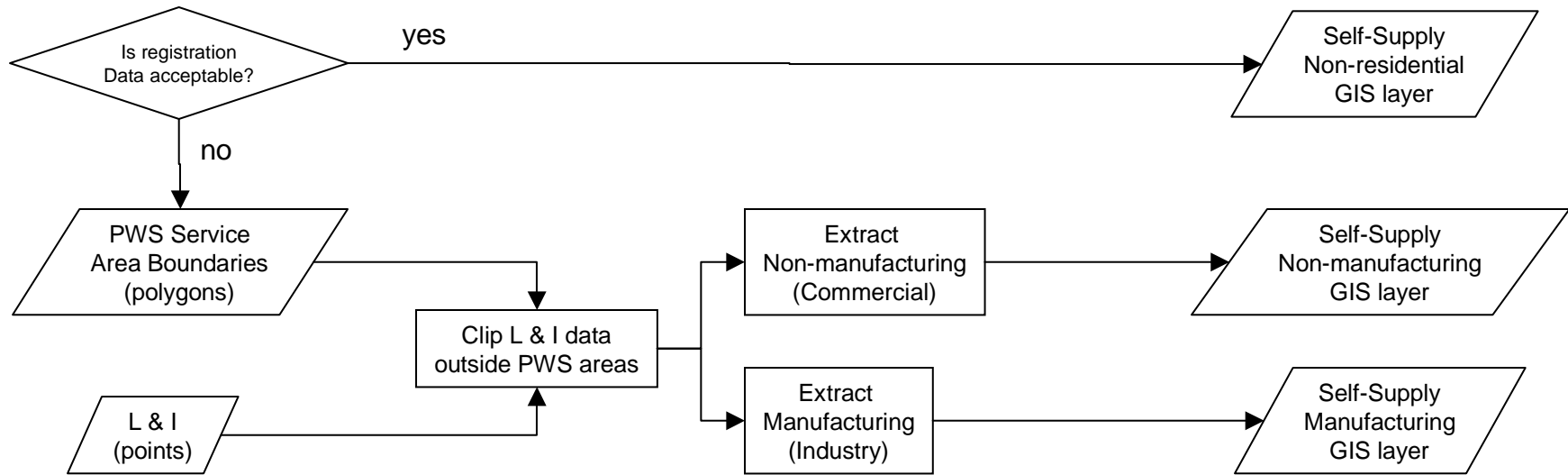


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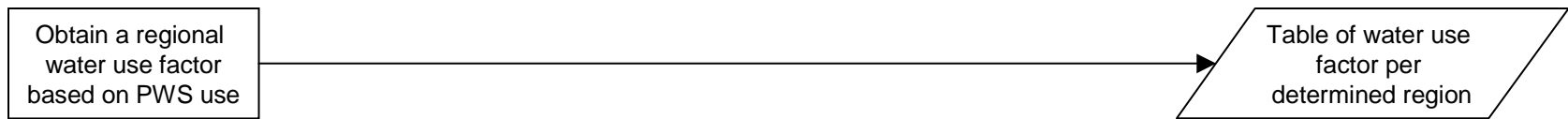


3b. Self-Supplied - Non-residential (Present)

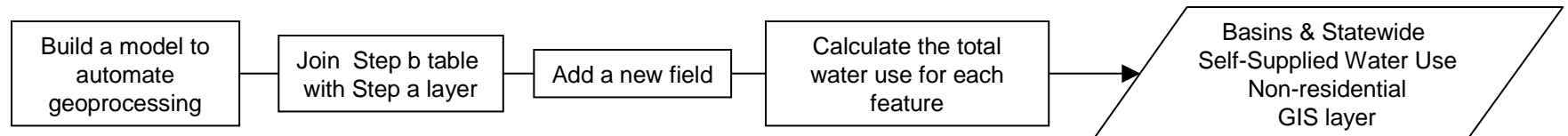
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Step b.

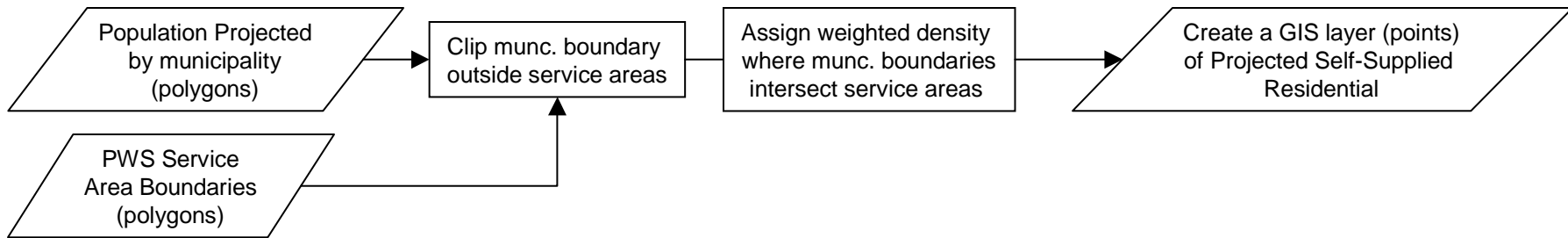


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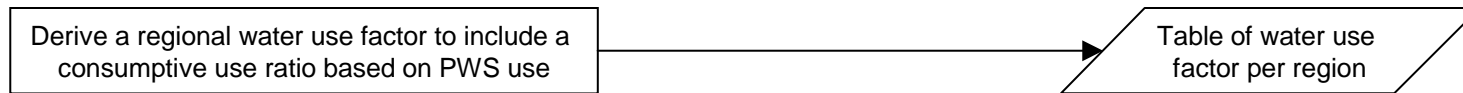


3c. Self-Supplied - Residential (Future)

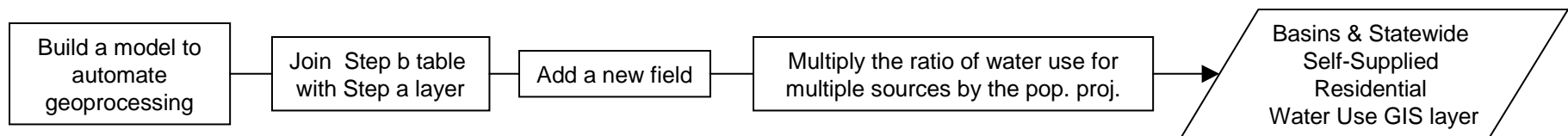
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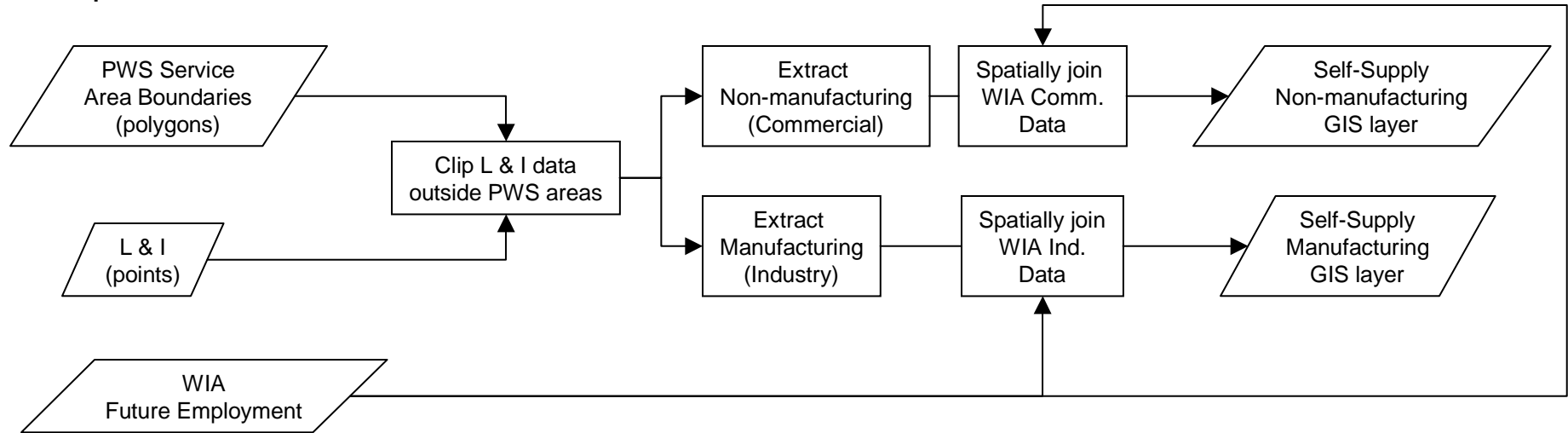


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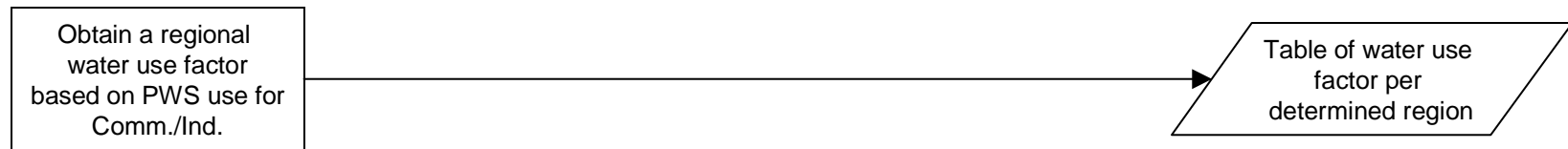


3d. Self-Supplied - Non-residential (Future)

Step a.



Step b.



Step c.

