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Not subject to the requirements
of Section 3507, Paperwork
Reduction Act of 1980.

ENCLOSURE 1

INFORMATION REQUESTED

Please provide separate reports for each plant owned and operated by your company that mines or processes talc. If you have any questions regarding this questionnaire, please contact John Copeland of EPA at (919) 541-5597.

A. Talc Mining and Production - General Plant Information

1. a. Plant name Alpine Plant
b. Address Highway 46, Alpine, Alabama
2. a. Legal owner Cyprus Industrial Minerals Company
b. Subsidiary of Cyprus Minerals Company
3. Respondent
a. Name and title Marvin R. McCune, Operations Manager
b. Address P.O. Box 21, Alpine, AL 35014
c. Telephone No. 205-268-2211
4. Plant coordinates - latitude 33 ° 20' min 50" s
longitude 86 ° 14' min 49" s
5. Typical hours of operation
24 hours/day 5 days/week 50 weeks/year
6. Please provide a brief description of the terrain features surrounding the plant. Generally flat terrain with mixture of pine forest land and farm land.
7. What is the distance from the plant to the nearest residence?
1/4 mile

Please return completed questionnaire to:

Jack R. Farmer
Director, ESED (MD-13)
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

**PLAINTIFF'S
EXHIBIT
CAM-189**

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8. Description of raw materials mined and processed for producing talc expressed in geological terms.

Alpine processes the natural mineral talc (hydrous magnesium
silicate) from four mines: Beaverhead, MT; Alpine, AL;
Australian Talc; Italian Talc

9. Raw material throughput in short tons for each of the last three years

1984 8,710 tons 1985 9,009 tons 1986 8,352 tons

10. Brief description of the end-products produced and production in tons of each achieved in 1986 (attach separate sheets as needed).

All 8352 tons of finished product were sold to the cosmetic
pharmaceutical and food markets. Data sheets attached.

11. Descriptions and amounts (short tons) of any waste materials generated in 1986.

The Alpine plant is a wet process - flotation processing facility
for talc ores. The wet process waste stream is gangue material
from the ore made up of dolomite, clay and quartz, and was
1,253 tons for 1986.

B. Talc Production- Description of Processes

1. Please provide a plan view drawing showing the relative locations of processing equipment, control devices, and any stockpiles of raw materials, products, and wastes. Identify stacks and other emission discharge points on the plan view.

2. Please provide detailed process flow diagrams showing the unit processes operated from primary crushing through product handling, packaging, and shipping. Indicate on the diagrams the location of local exhaust hoods and ventilation points, and spray nozzles if wet dust suppression techniques are used.

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B. Talc Production- Description of Processes

1. Please provide a plan view drawing showing the relative locations of processing equipment, control devices, and any stockpiles of raw materials, products, and wastes. Identify stacks and other emission discharge points on the plan view.

Plan view map attached.

2. Please provide detailed process flow diagrams showing the unit processes operated from primary crushing through product handling, packaging, and shipping. Indicate on the diagrams the location of local exhaust hoods and ventilation points, and spray nozzles if wet dust suppression techniques are used.

Flow sheet attached.

3. Please provide a thorough description of the crushing plant. The description should include the following information:

- a. Number, type (e.g., jaw, gyratory, cone, impact, etc.), size and capacity (tons per hour) of crushers used for primary, secondary, and tertiary crushing.
- b. Moisture content of feed materials at each crushing stage.
- c. Particle size of feed materials and discharge at each crushing stage.
- d. Number, type, dimensions, and number of decks of scalping and finishing screens used at each crushing stage.
- e. Particle size and destination of the oversize and undersize (throughs) at each screen deck.
- f. Location of exhaust hoods or other ventilation points. Include ventilation rates (cubic feet per minute) for each exhaust point identified.
- g. Description of any wet dust suppression techniques used, including location of sprays, application rates (gallons per minute), suppressant used (water only or water plus a surfactant), and supplier of surfactant, if used.

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- A. One 30F Williams Hammermill. Capacity is 40 TPH.
- B. Moisture averages ~3%.
- C. Feed to crusher ranges from minus 6" ore from the Alabama mine to minus 3" for Beaverhead, Italian, and Australian crude. All talc is crushed to minus 1/2".
- D. No screens
- E. Not applicable
- F. None.
- G. Not applicable.

7. Stockpiles

Please provide an inventory of outdoor product and waste stockpiles. Include for each stockpile a description of the material stored, the stockpile dimensions, and the percent material less than 200 mesh. Indicate whether the stockpiles are active or inactive, and describe any control practices (e.g., wind breaks, wetting, chemical stabilization, vegetation cover) employed.

<u>MATERIAL</u>	<u>STOCKPILE DIMENSION</u>	<u><200 MESH</u>
Beaverhead Talc - 500 Tons	30' X 40' X 8'	<5%
Alabama Talc - 3000 Tons	80' X 90' X 10'	<10%
Italian Talc - 5000 Tons	80' X 150' X 15"	<5%
Australian Talc - 2000 Tons	60' X 75' X 10'	<5%

- All stockpiles are active.
- Covered shed storage is utilized for approx. 5000 tons.
- Remaining crude is tarped to minimize moisture pick-up from Alabama's "heavy" rains.

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4. Conveying Systems

Description of conveying systems used throughout the plants. Include information on length and width, number of transfer points and emission control practices (exhaust hoods, wet suppression, covers, etc.).

5. Beneficiation Processes

Please describe any beneficiation process(es) in use. Identify any unit which processes dry materials and its associated air pollution control equipment.

6. Drying or Calcining Operations

If the material is dried (or calcined), please describe the equipment used (rotary kiln, fluid-bed, etc.), the source of process heat (i.e., natural gas, oil, etc.), production rate, and any associated air pollution control equipment.

8. Bagging or Packaging

Please describe any bagging or packaging operations, including a description of any hooding or wet dust suppression techniques applied.

9. Product Handling

Describe the manner in which bulk products are shipped from the plant (e.g., railcar; covered hopper, open hopper, gondola, etc; truck, ship, barge). Indicate method of product loading either through written description or on a drawing or plan.

B-4, 5, 6, 8, & 9 are covered in the following narrative.

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B-4, B-5, B-6, B-8, and B-9

The -6" talc ore from the Alabama mine or imported from other mining locations is fed across a Jefferson apron feeder into a size 30F Williams hammermill to crush the ore to - $\frac{1}{2}$ ". The crusher will process 40 TPH of talc with moisture contents up to 5%.

The crushed feed is transported via bucket elevator and closed screw conveyor into the feed storage bin for processing in the wet flotation process. From the feed bin the talc feed is metered into a wetting drum with water added at 15 gpm to put the talc into slurry for grinding, floatation, and bleaching. The slurried talc is wet milled to -60 mesh in a hardinge conical ball mill. The mill grinds using 3/4" steel balls with the product routed over a 50 mesh screen. The -50 mesh material goes to floatation while the +50 mesh material is sent back to the ball mill for regrinding.

In floatation, the basic technology involves grinding the ore to a size where all of the gangue is liberated. Gangue is the unwanted material such as dolomite in talc. At liberation size the talc and dolomite exist as separate particles and display different surface chemistry. Using a frothing agent, such as Methyl Isobutyl Carbinol, in the water; when air is blown through the slurry; the talc attaches selectively to the bubbles and floats to the top of the cells to be removed.

The Alpine Plant is equipped to accomplish floatation in a two or three stage series process. The product from floatation is bleached in large wooden tanks to increase brightness. Bleaching consists of acidifying the mineral slurry with hydrochloric acid and then converting the iron discoloration to a soluble form using hydrosulfite. The bleached product is allowed to settle in gravity thickeners to increase slurry solids concentration. The slurry is then acid washed and water washed while being filtered on rotary drum vacuum filters.

The talc slurries are transferred through the wet process system with an appropriate pump dependent on the slurry solids.

The filter cake from the rotary vacuum filter at 80% solids is back-mixed with dry product to bring the solids up to 85% for processing through the dryer system.

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The filter cake is fed with hot air to a Raymond impact mill flash drying system. The dry product is collected via cyclone and transferred in closed screw conveyors and bucket elevators to the dry grinding mill feed bins.

The dryer unit is a natural gas fired unit which at present will process 2.5 to 3.0 tons per hour of dry product. The dryer cyclone vapor discharge is processed through a wet scrubber to remove any solids before the air is discharged. The scrubbed slurry is recovered to the wet process system.

The wet plant -50 mesh product is dry ground to finished products desired on either a Raymond roller mill circuit or a Raymond vertical mill circuit.

The roller mill is a medium grinding machine where the product is conveyed through the mill in a rapidly moving air stream. Above the grinding section the material is classified with a multiple fixed blade separator which allows the desired product to pass. The finished product is collected via cyclone into a product bin. The excess air in the system is processed through a pulse jet baghouse to remove any dust which is also placed in the product bin. Figures 1 and 2 show the roller mill and processing circuit.

The Raymond vertical mill circuit is similar to the roller mill circuit with the exception of the grinding mechanism. The vertical mill is an air swept hammermill with the hammers, classifying blades, and internal fan all on the same shaft. Figure 3 shows the Raymond vertical mill.

The finished product is packed through two 107 St. Regis impeller pinch-tube packers. The packers are equipped with and connected to the plant vacuum cleanup system. There are vacuum pickups located at the individual packer spouts and a trough vacuum pickup to catch any spilled material. The retrieved talc dust is captured in the Micropulsaire vacuum cleanup baghouse and returned to the plant feed system.

Semi-bulk bags are filled from a closed system from a product bin through a rotary valve into the bags with a dust pickup at the top of the filling sleeve carrying any dust to the cleanup system baghouse.

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Bulk truck or rail cars are loaded with positive displacement pumps with a vacuum pickup to return any dust to the cleanup system baghouse.

Figure 1 - Roller Mill

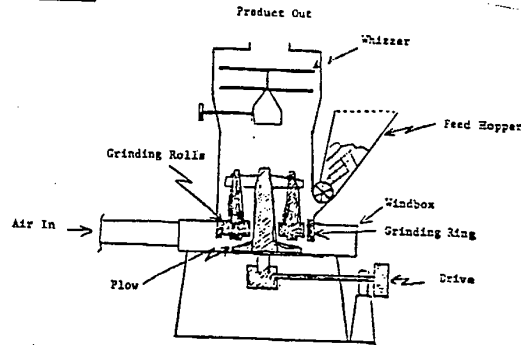


Figure 2 - Roller Mill Circuit

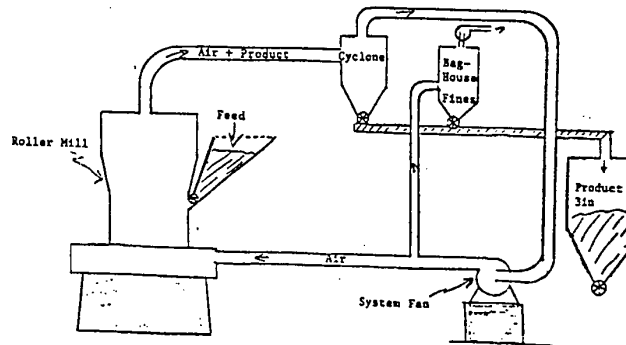
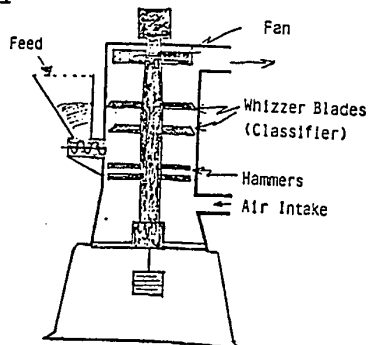
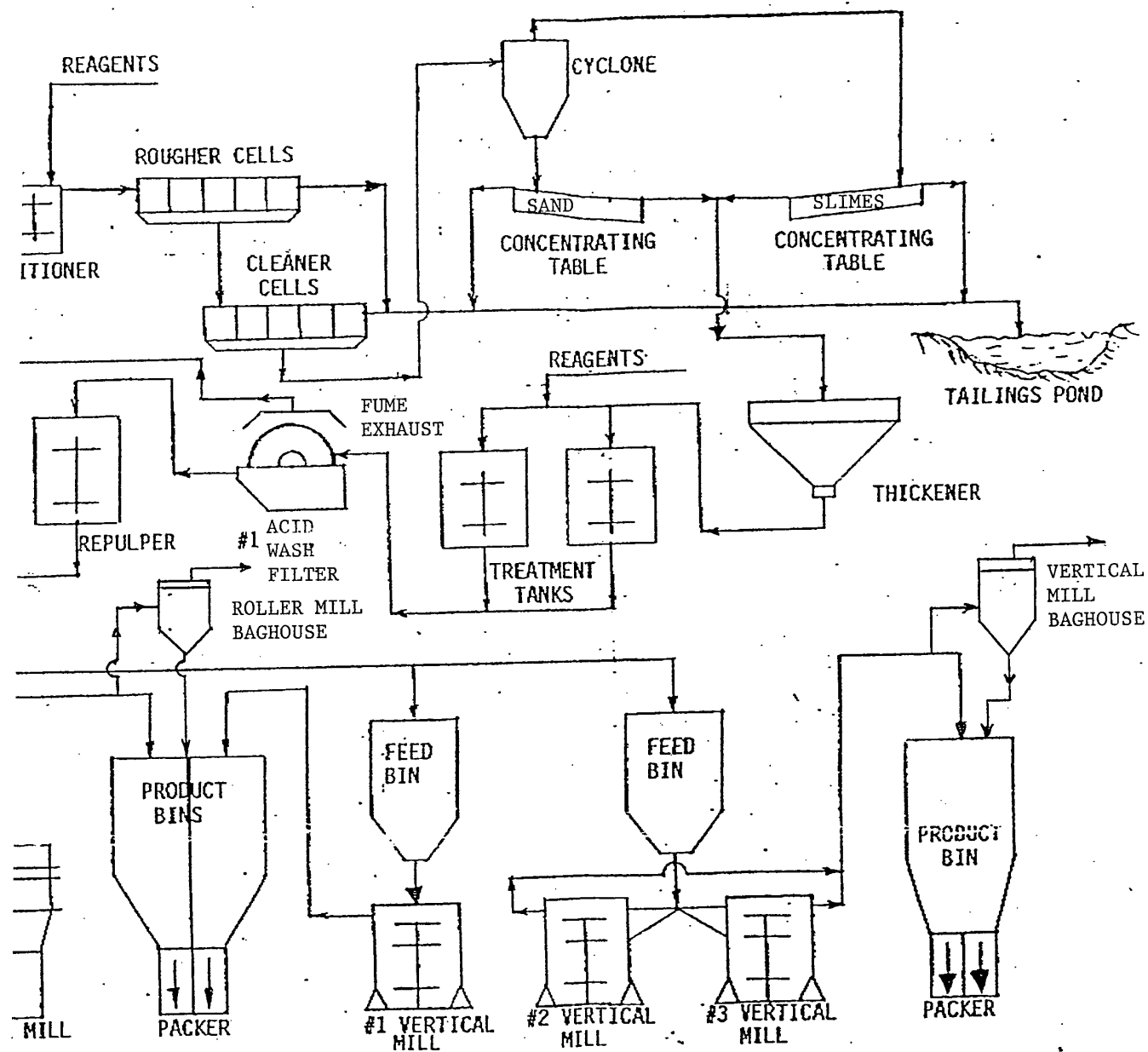


Figure 3

Raymond Vertical Mill



ALPINE PLANT FLOWSHEET



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C. Talc Production*- Air Pollution Control Devices

For each air pollution control device applied, please provide the following information. If more than three control devices are used, copy this portion of the questionnaire before answering and attach additional sheets.

	<u>Control Devices</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
1. General			
a. Type (baghouse, scrubber, (ESP, etc.))	<u>SEE ATTACHMENT NO. 7</u>		
b. Emission sources served			
c. Gas flow rate, acfm			
d. Gas temperature °F			
f. Outlet particulate loading, gr/dscf *			
g. Quantity of dust/sludge collected in 1986, tons			
h. Destination of dust/sludge			

* Indicate whether based on actual measurement or estimated.

2. Baghouses	Vacuum Cleanup	Roller Mill Baghouse	Vertical Mill Baghouse
a. Type (mechanical shaker, pulse jet, etc.)	<u>Pulse Jet</u>	<u>Pulse Jet</u>	<u>Pulse Jet</u>
b. Number of compartments	<u>42</u>	<u>80</u>	<u>100</u>
c. Cloth area, ft ²	<u>395</u>	<u>754</u>	<u>1000</u>
d. Air-to-cloth ratio, ft/min	<u>6.3</u>	<u>6.2</u>	<u>6.0</u>
e. Bag material (woven, felted, Dacron, etc.)	<u>Dacron</u>	<u>Dacron</u>	<u>Dacron</u>
f. Cooling method (evaporative, air dilution, radiative)	<u>Air Dilution</u>	<u>Air Dilution</u>	<u>Air Dilution</u>

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CONTROL DEVICES

	Flash Drying System Scrubber	Filter Exhaust Acid Fume Scrubber
	1	2
3. Wet Scrubbers		
a. Type (venturi, rotoclone, etc.)	Water Spray & Packed Tray	Packed Column Ceramic Burl Saddles
b. Liquid flow rate, gpm	30	20
c. Pressure drop, in. of water	8"	6"
d. Liquid-to-gas ratio	0.026 Lbs/Ft. ³	0.067 Lbs/Ft. ³
4. Electrostatic Precipitation		
a. Type (plate, tube)	None	None
b. Number of parallel fields and stages per field		
c. Total plate area, ft ²		
d. Specific collection area, ft ² /1000 acfm		
e. Dust resistivity, ohm-cm		
f. Design efficiency, %		
g. Primary power supply Voltage, volts		
Current, amps		
h. Secondary power supply Voltage, kilovolts		
Current, milliamps		
i. Schematic of electrical sectionalization (attach)		
5. Stack Parameters		
Height, ft	60	44
Diameter, inches	20	12
Discharge velocity, fpm	4358	2520
Gas temperature, °F	135	Ambient + 15°F

ATTACHMENT NO. 7

C. Talc Production - Air Pollution Control Devices

1. General

CONTROL DEVICES

	Vacuum Cleanup System	Roller Mill Dust Collector	Vertical Mill Dust Collector	Flash Dryer Scrubber	Filter-Acid Fume Scrubber
a. Type	Baghouse	Baghouse	Baghouse	Wet Scrubber	Wet Scrubber
b. Emission Sources Served	Packer Dust Control; Bulk Bag Filling; Bulk Truck and Rail Car Filling Floor Dust Cleanup	Roller Mill Discharge Air Stream	Vertical Mill Discharge Air Stream	Flash Dryer System Air Discharge	Rotary Drum Filter Fumes
c. Gas Flow Rate/CFM	2500	4000	6000	9500	2500
d. Gas Temp. °F	Ambient + 15°F	170	150	135	Ambient +15°F
*f. Outlet Particulate Loading	0	0	0	6.34 Allowable; 3.23 Actual lbs/hr	SO ₂ - 1.58E-02 HCl - 8.95E-05 lbs/hr
g. Quantity Dust/Sludge Collected 1986 - Tons	0	0	0	0	0
h. Destination of Dust/Sludge	Returned to Mill Feed System	Into Product Bin	Into Product Bin	Returned to Wet Process System	Discharge Water to Treatment Pond

*Letter e was missing on form

ITA-LG 00233

Please Note: Responses for question's D&E, pages 7-10, reflect the policy of Cyprus Industrial Minerals Company on talc and asbestos. It is our policy not to sell talc products that contain detectable quantities of chrysotile, amosite, crocidolite, asbestiform and non-asbestiform tremolite, actinolite, and anthophyllite. Our in-house analytical capabilities include:

- phase contrast microscopy
- polarlight light microscopy with dispersion staining
- SEM with EDX
- AEM with TEM/STEM; EDX and SAED
- XRD with high intensity, slow step-scanning capability

D. Information on Major Raw Materials for Producing Talc
(Submit separate form for each raw material.)

1. Description of raw material. Crude talc

2. Source of raw material. Australian Talc Mine (Three Springs, Aus.)

3. Fiber content characteristics of raw material.

a. Percent of following fibers in raw material. Specify whether
percent by weight X area _____ other _____.

	<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code *</u>
Actinolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentine	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite- Amosite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

b. Fiber size distribution by type of fiber.

Not applicable

c. Total fiber content of collected material including non-asbestos fibers. Specify whether percent by weight X

area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

E. Talc Production-- Information on Materials Collected by Air Pollution Control Devices (Submit separate form for each control device.)

1. Control device identification from Section C - Air Pollution Control Devices

All pollution control devices utilized by Cyprus.

2. Fiber content characteristics of collected material.

- a. Percent of following fibers in collected material. Specify whether percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Estimate</u>	<u>Test code</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentinite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite-Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

- b. Fiber size distribution by type of fiber.

Not applicable

c. Total_fiber content of raw material including non-asbestos fibers

Specify whether percent by weight X area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>2%*</u>	<u>1,2,3,4,5</u>

* Talc fragments having an aspect ratio equivalent to or greater than 3:1.

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

D. Information on Major Raw Materials for Producing Talc *
(Submit separate form for each raw material.)

1. Description of raw material. Crude talc

2. Source of raw material. Beaverhead Talc Mine

3. Fiber content characteristics of raw material.

a. Percent of following fibers in raw material. Specify whether
percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code *</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentinite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite- Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

b. Fiber size distribution by type of fiber.

Not applicable

c. Total fiber content of collected material including non-asbestos

fibers. Specify whether percent by weight X

area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

E. ~~Talc Production~~ - Information on Materials Collected by Air Pollution Control Devices (Submit separate form for each control device.)

1. Control device identification from Section C - Air Pollution Control Devices

All pollution control devices utilized by Cyprus.

2. Fiber content characteristics of collected material.

- a. Percent of following fibers in collected material. Specify whether percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Estimate</u>	<u>Test code</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentinite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite-Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

- b. Fiber size distribution by type of fiber.

Not applicable

c. Total fiber content of raw material including non-asbestos fibers

Specify whether percent by weight X area other .

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
<u> </u>	<u> </u>	<u>2%*</u>	<u>1,2,3,4,5</u>

* Talc fragments having an aspect ratio equivalent to or greater than 3:1.

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

D. Information on Major Raw Materials for Producing Talc *
(Submit separate form for each raw material.)

1. Description of raw material. Crude talc

2. Source of raw material. Alabama Talc Mine

3. Fiber content characteristics of raw material.

a. Percent of following fibers in raw material. Specify whether
percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code *</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentine	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite- Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

b. Fiber size distribution by type of fiber.

Not applicable

c. Total fiber content of collected material including non-asbestos

fibers. Specify whether percent by weight X

area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

* Use the following for test codes:

Phase contrast	1
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X-ray diffraction	5
Other (it is not necessary to specify)	6

Test Code

E. Talc Production-- Information on Materials Collected by Air Pollution Control Devices (Submit separate form for each control device.)

1. Control device identification from Section C - Air Pollution Control Devices

All pollution control devices utilized by Cyprus.

2. Fiber content characteristics of collected material.

- a. Percent of following fibers in collected material. Specify whether percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Estimate</u>	<u>Test code</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentine	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite-Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

- b. Fiber size distribution by type of fiber.

Not applicable

c. Total_fiber content of raw material including non-asbestos fibers

Specify whether percent by weight X area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>2%*</u>	<u>1,2,3,4,5</u>

* Talc fragments having an aspect ratio equivalent to or greater than 3:1.

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

D. Information on Major Raw Materials for Producing-Talc *
(Submit separate form for each raw material.)

1. Description of raw material. Crude talc

2. Source of raw material. Italian Talc Mine (Val Chisone, Italy)

3. Fiber content characteristics of raw material.

a. Percent of following fibers in raw material. Specify whether
percent by weight x area _____ other _____.

	<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code *</u>
Actinolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentine	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite- Amosite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

b. Fiber size distribution by type of fiber.

Not applicable

c. Total fiber content of collected material including non-asbestosfibers. Specify whether percent by weight X

area _____ other _____.

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
_____	_____	<u>N.D.</u>	<u>1,2,3,4,5</u>

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

E. Talc Production- Information on Materials Collected by Air Pollution Control Devices (Submit separate form for each control device.)

1. Control device identification from Section C - Air Pollution Control Devices

All pollution control devices utilized by Cyprus.

2. Fiber content characteristics of collected material.

- a. Percent of following fibers in collected material. Specify whether percent by weight X area other .

	<u>Min</u>	<u>Max</u>	<u>Estimate</u>	<u>Test code</u>
Actinolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Actinolite-Tremolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Chrysotile-serpentine	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Riebeckite-crocidolite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Cummingtonite-Grunerite-Amosite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
Anthophyllite	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>
TOTAL	<u> </u>	<u> </u>	<u>N.D.</u>	<u>1,2,3,4,5</u>

- b. Fiber size distribution by type of fiber.

Not applicable

c. Total_fiber content of raw material including non-asbestos fibers

Specify whether percent by weight X area other .

<u>Min</u>	<u>Max</u>	<u>Best Estimate</u>	<u>Test code</u>
<u> </u>	<u> </u>	<u>2%*</u>	<u>1,2,3,4,5</u>

* Talc fragments having an aspect ratio equivalent to or greater than 3:1.

* Use the following for test codes:

	<u>Test Code</u>
Phase contrast	1
Polarized light	2
Scanning electron	3
Transmission electron	4
X-ray diffraction	5
Other (it is not necessary to specify)	6

ALTALC 200 USP

Talc Product #1835

200 MESH - Conforms to
USP, CTFA and Food Codex
Cosmetic and Pharmaceutical

PHYSICAL PROPERTIES

Brightness	86 ± 2%	GEB, MgO = 100%
Loose Density	29 ± 2 lbs/ft ³	CTFA C8-1
Tapped Density	62 ± 2 lbs/ft ³	CTFA C7-1
Specific Gravity	2.8	ASTM 153-82
Acid Solubles	2% max	USP XXI
Oil Absorption - SRO	27 ± 3g/100g	ASTM D281
Water Solubles	0.1% max	USP XXI
Filtrate Reaction to Litmus	Neutral	USP XXI
Water Soluble Iron	Not Detected	USP XXI

MICRO BIOLOGICAL

Total Aerobic Plate Count (incl. Yeast & Mold)	< 100 per gram	CSTM 34
Gram Negative Plate Count	Not Detected	CSTM 34

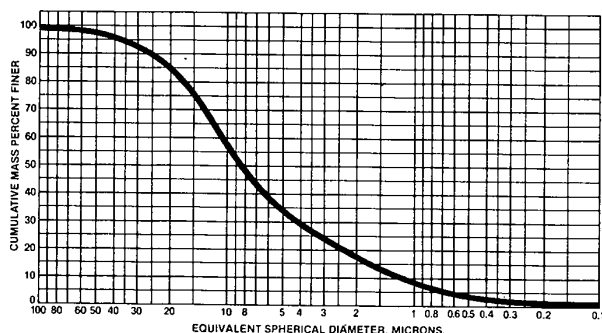
Specially treated for control of bacteria.

PARTICLE SIZE DISTRIBUTION

Percent Passing	200 MESH	98 min.
	325 MESH	97
	20 μ m	85
	10 μ m	56
	5 μ m	34
	2 μ m	17
	1 μ m	9

MEDIAN PARTICLE SIZE 8.5 μ m

SEDIGRAPH 5000



CHEMICAL ANALYSIS

MgO	31%	XRF
SiO ₂	61%	XRF
Fe ₂ O ₃	1%	XRF
CaO	0.5%	XRF
Al ₂ O ₃	1%	XRF
L.O.I.	5.5 ± 0.5%	USP XXI

Lead	< 5 ppm	USP XXI
Arsenic	< 1 ppm	USP XXI
Heavy Metals	< 20 ppm	USP XXI
Fluorine	< 20 ppm	Food Codex
Iron (extractable)	< 500 ppm	USP XXI
Quartz	< 1%	XRD
Amphibole Asbestos	Not Detected	CTFA J4-1

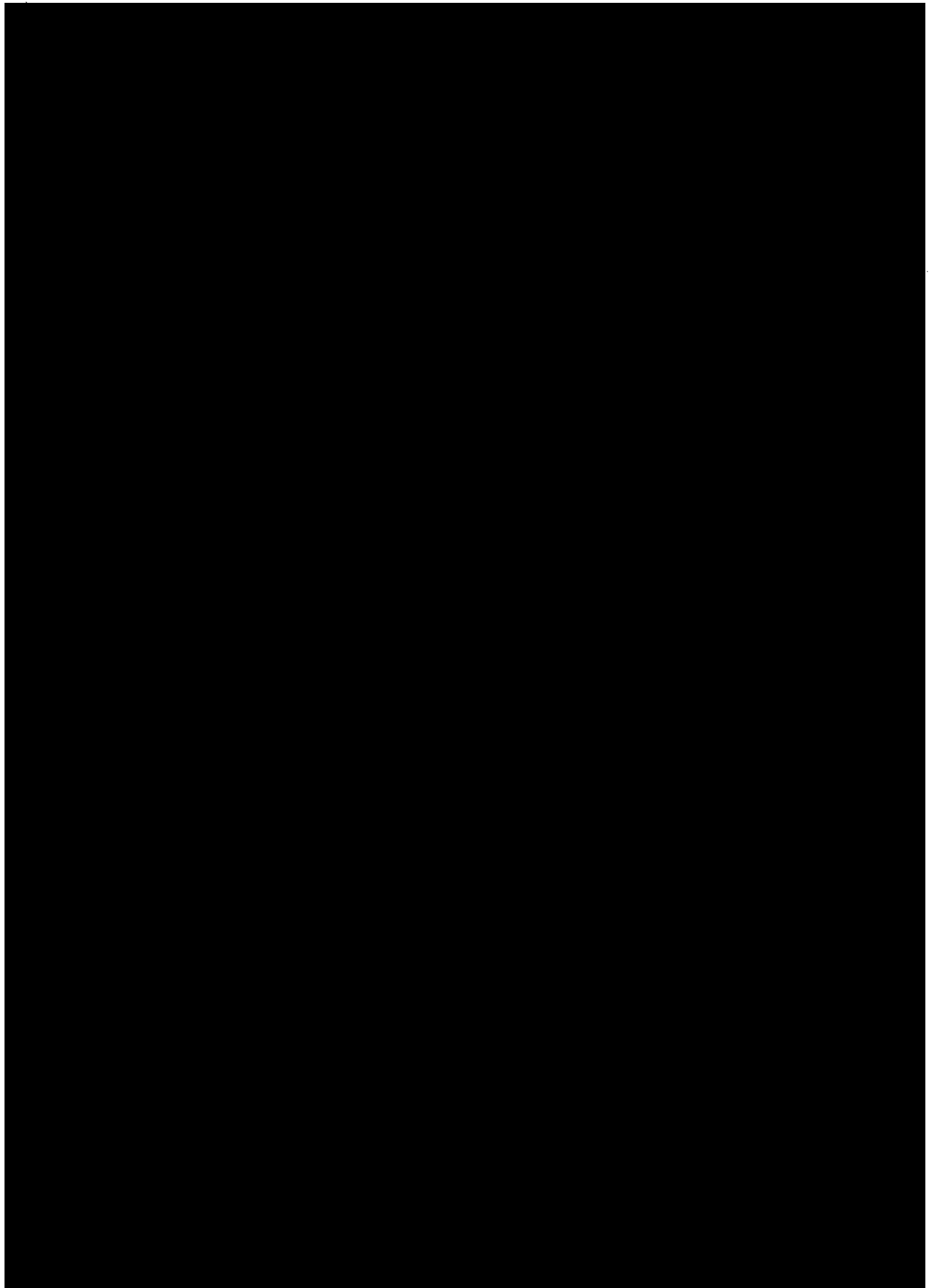
Asbestos, Tremolite, Actinolite and Anthophyllite are not detected by analytical techniques which include XRD, optical and electron microscopy.

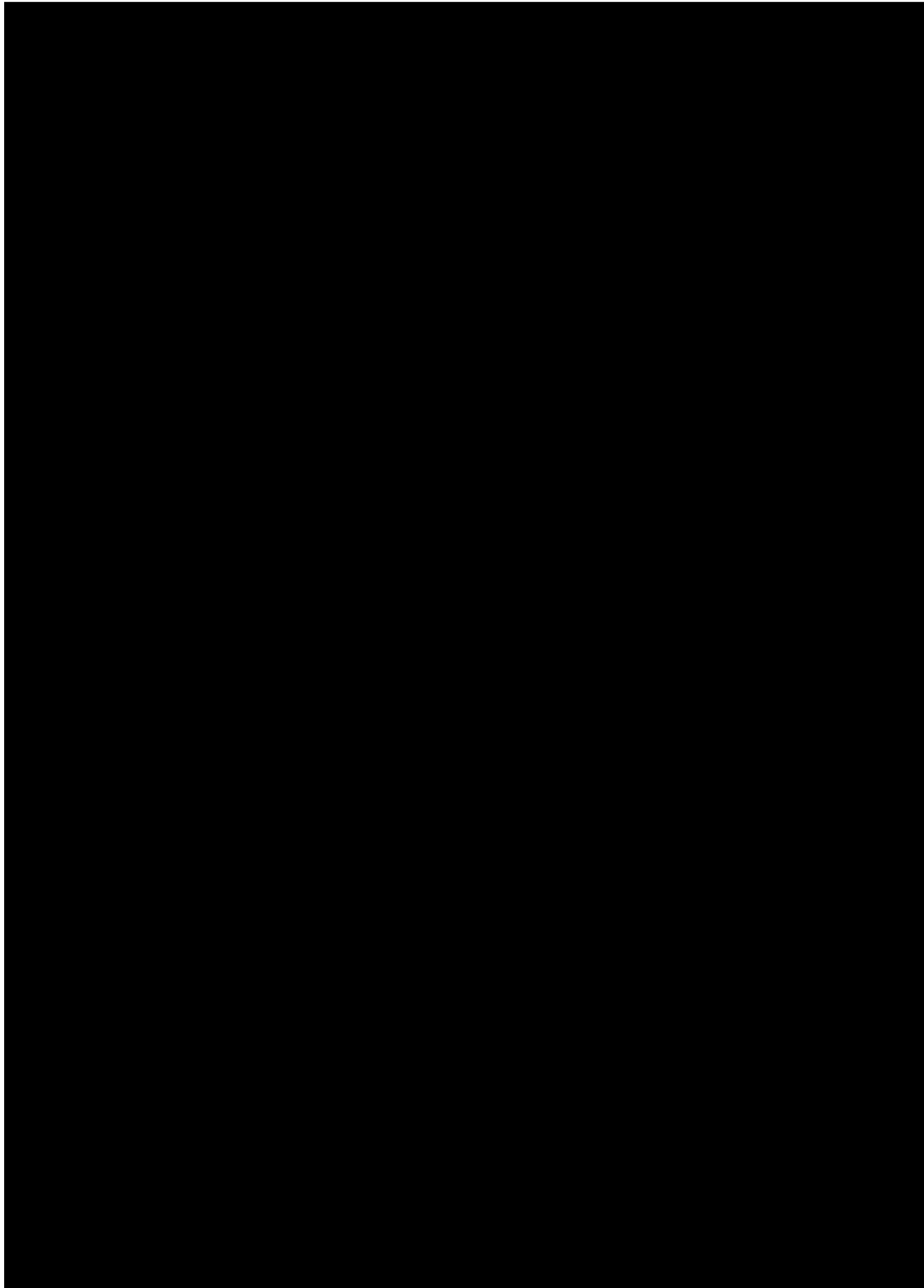
The data presented are based on tests that Cyprus believes to be reliable and are offered in good faith as typical of normal production, but Cyprus makes no warranty or representation of any kind, express or implied, regarding the information given or the product described, including any warranty of suitability for a particular purpose. The user is solely responsible for its use of the information and product. Cyprus disclaims any liability based on any claim of patent infringement.

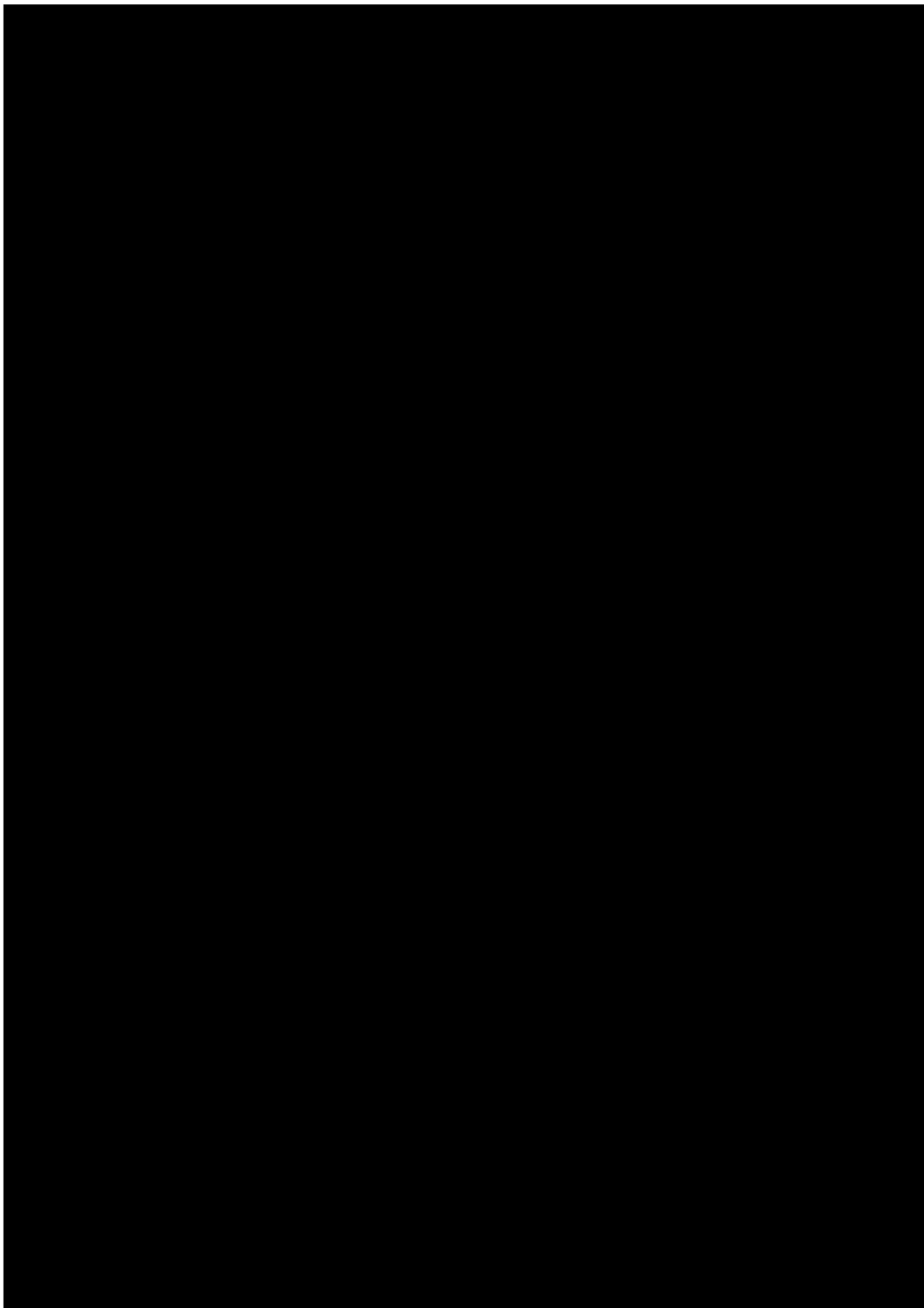


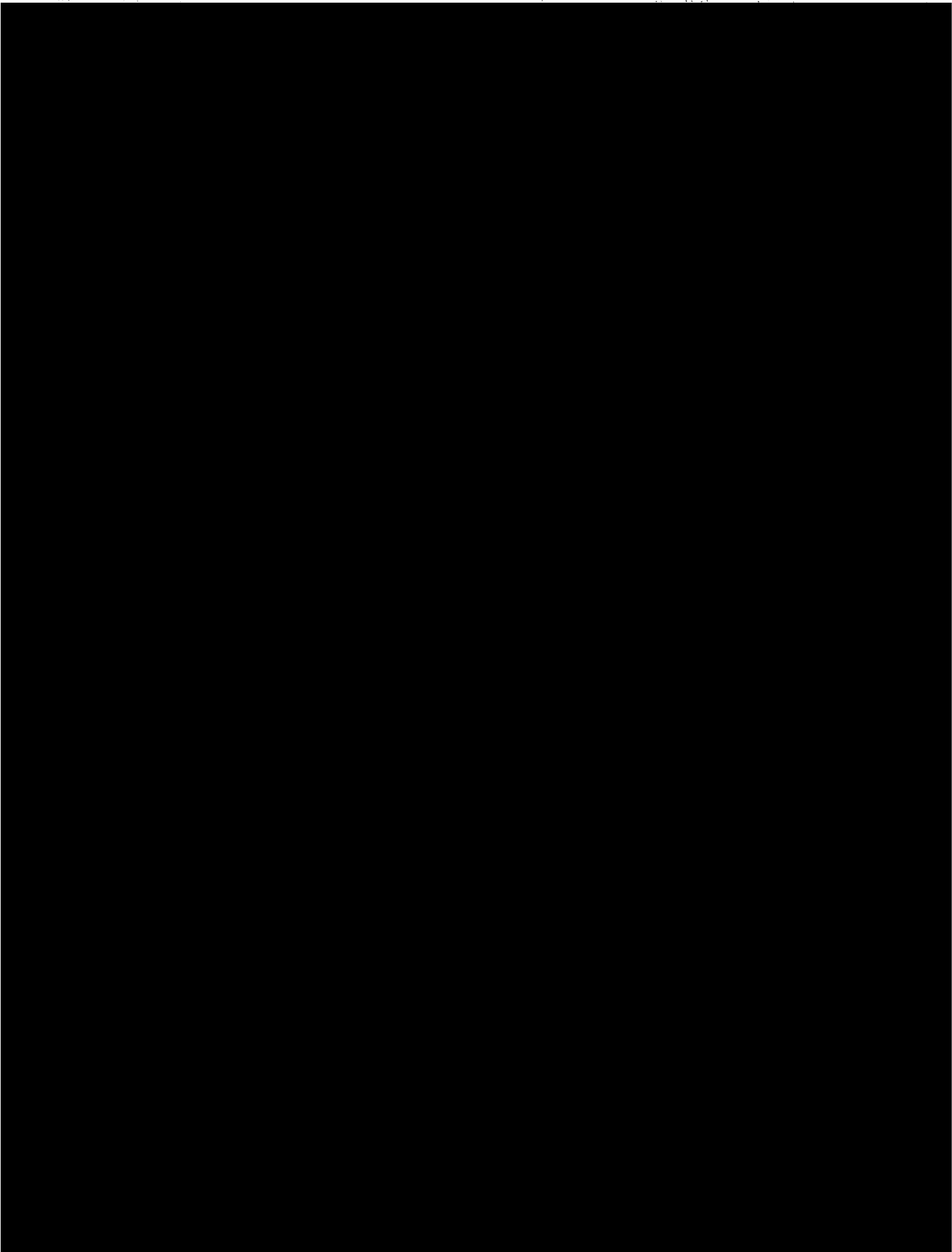
CYPRUS INDUSTRIAL MINERALS COMPANY
TALC DIVISION BOX #3419 ENGLEWOOD, CO 80155
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SUPRA A™

Talc Product #1707

Conforms to CTFA
Finest Quality Italian Cosmetic

PHYSICAL PROPERTIES

Brightness	87 ± 2%	GEB, MgO=100%
Loose Density	.384 ± .05 gm/cm ³	Scott Volumeter
Tapped Density	1.105 ± .05 gm/cm ³	CTFA C7-1
Specific Gravity	2.74	ASTM 153-82
Acid Solubles	1 ± 0.5%	CSTM 27 as CO ₂
Oil Absorption - Gardner-Coleman	45 ± 5g/100g	ASTM D1483
pH	9.0 ± 0.5	CSTM 5 @ 10% Slurry

MICROBIOLOGICAL

Total Aerobic Plate Count (incl. Yeast & Mold)	<100 per gram	CSTM 34
Gram Negative Plate Count	Not Detected	CSTM 34

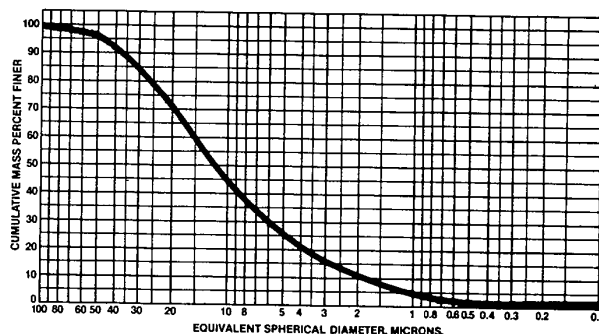
Specially treated for control of bacteria.

PARTICLE SIZE DISTRIBUTION

Percent Passing	200 MESH	98 min.
	20 µm	71
	1 µm	6

MEDIAN PARTICLE SIZE 12 µm

SEDIGRAPH 5000



CHEMICAL ANALYSIS

SiO ₂	60.4%	XRF
MgO	32.0%	XRF
Fe ₂ O ₃	0.9%	XRF
Al ₂ O ₃	0.6%	XRF
Na ₂ O	0.3%	XRF
TiO ₂	0.2%	XRF
CaO	0.1%	XRF
L.O.I.	5.5 ± .5%	USPXXI

MINERAL ANALYSIS

Lead	<10 ppm	USPXXI
Arsenic	<3 ppm	USPXXI
Heavy Metals	<40 ppm	USPXXI
Iron (extractable)	<500 ppm	USPXXI
Quartz	<1%	XRD
Amphibole Asbestos ...	Not Detected	CTFA J4-1

Asbestos, Tremolite, Actinolite and Anthophyllite are not detected by analytical techniques which include XRD, optical and electron microscopy.

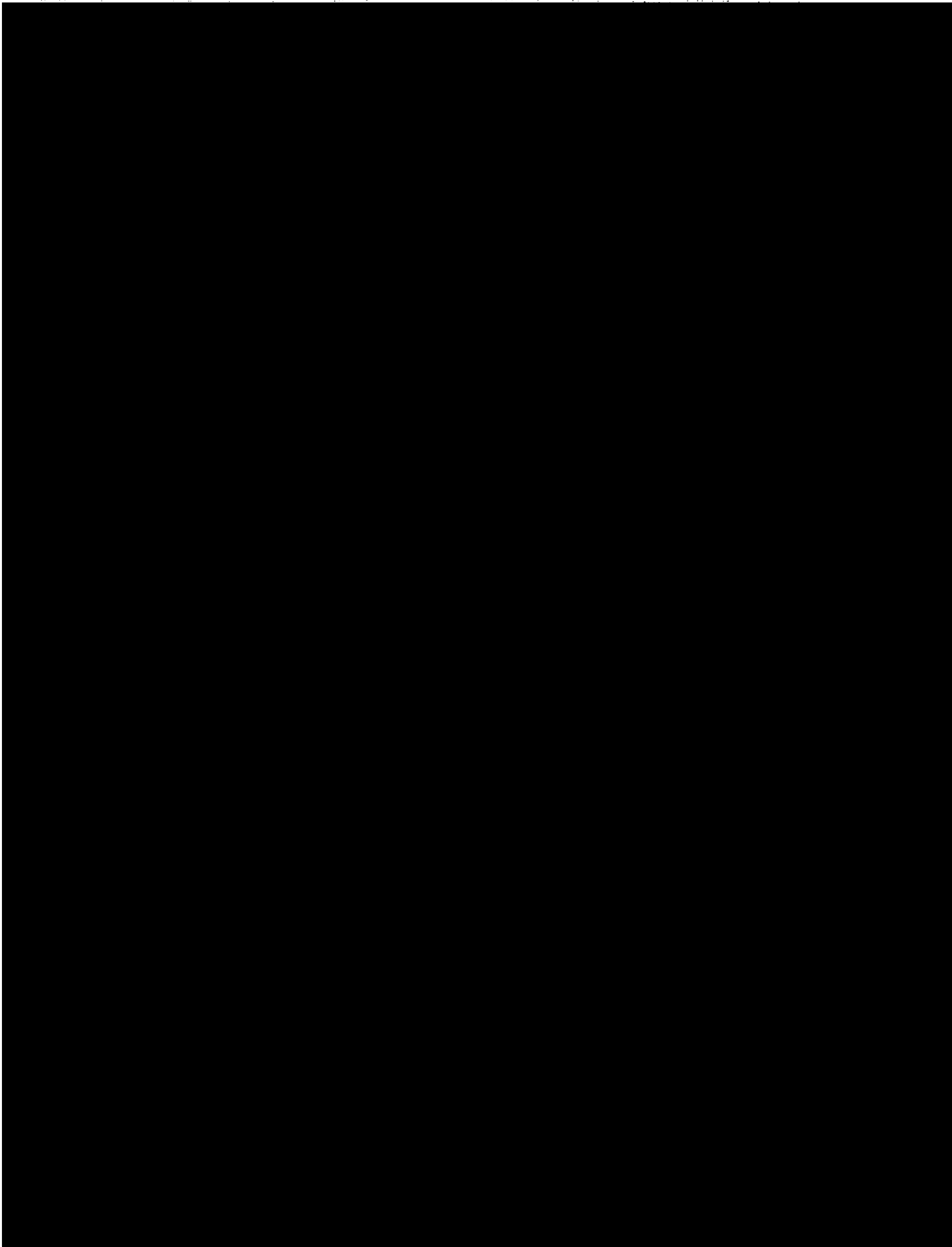
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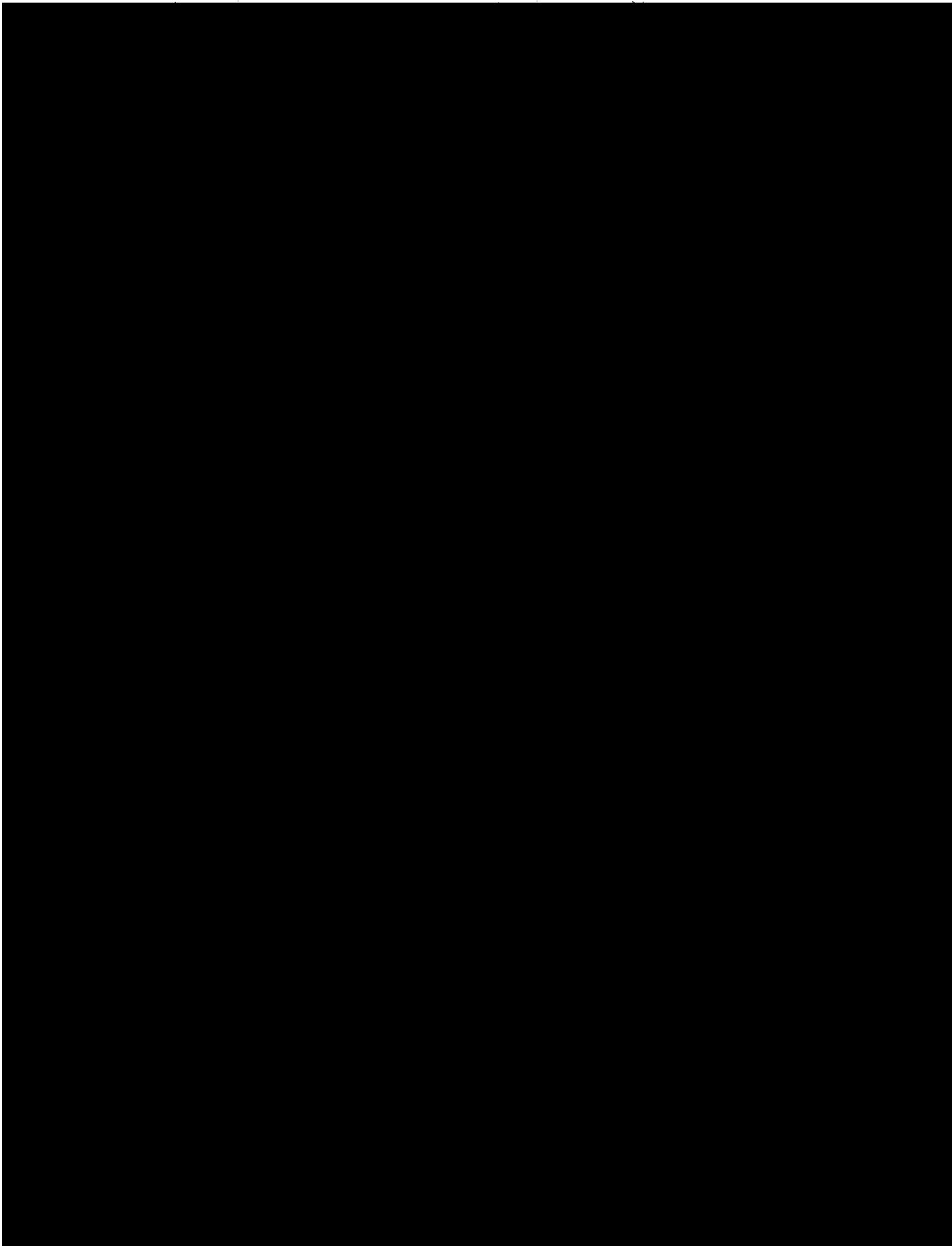
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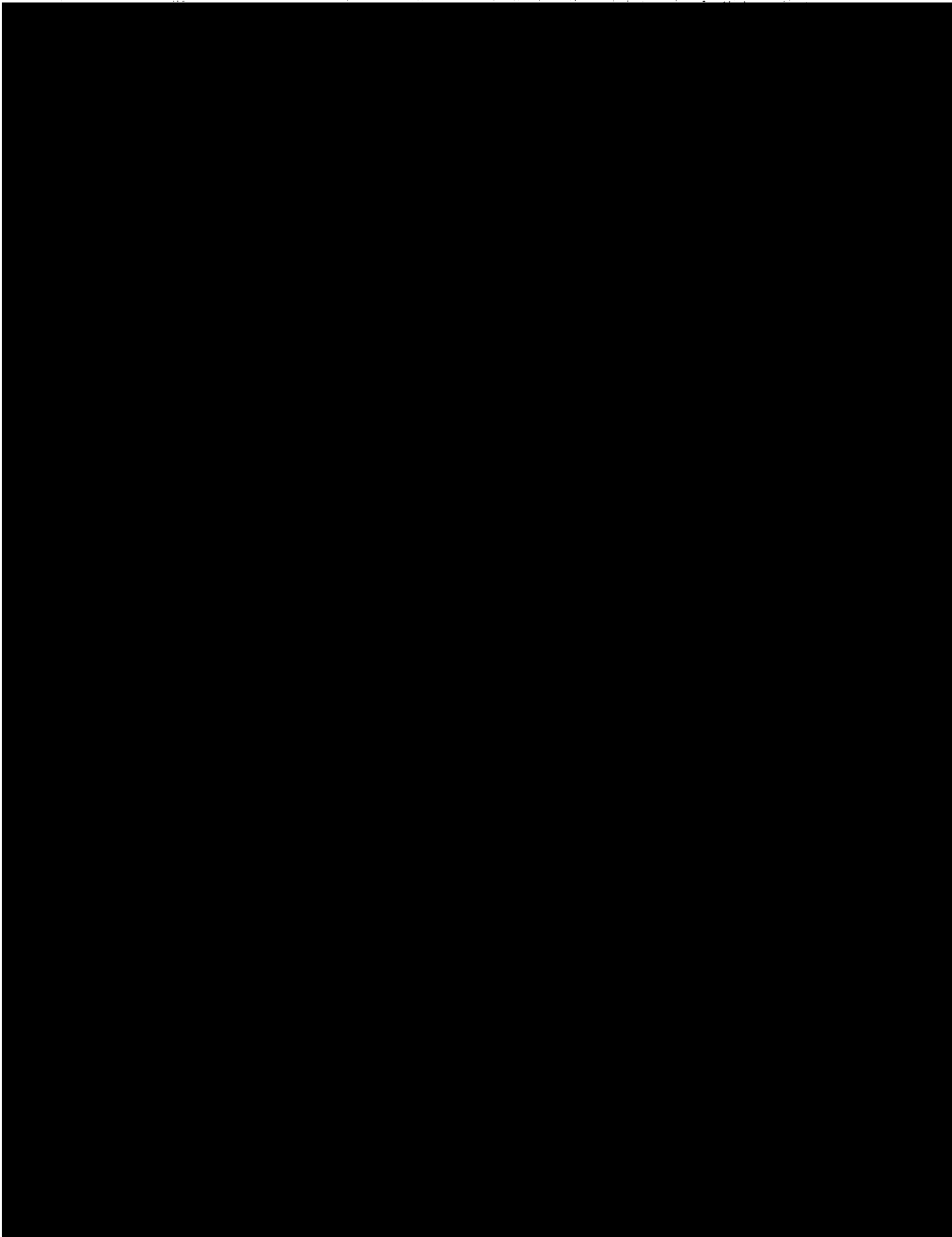
CYPRUS INDUSTRIAL MINERALS COMPANY
BOX #3299 ENGLEWOOD, CO 80155
1-800-325-0299

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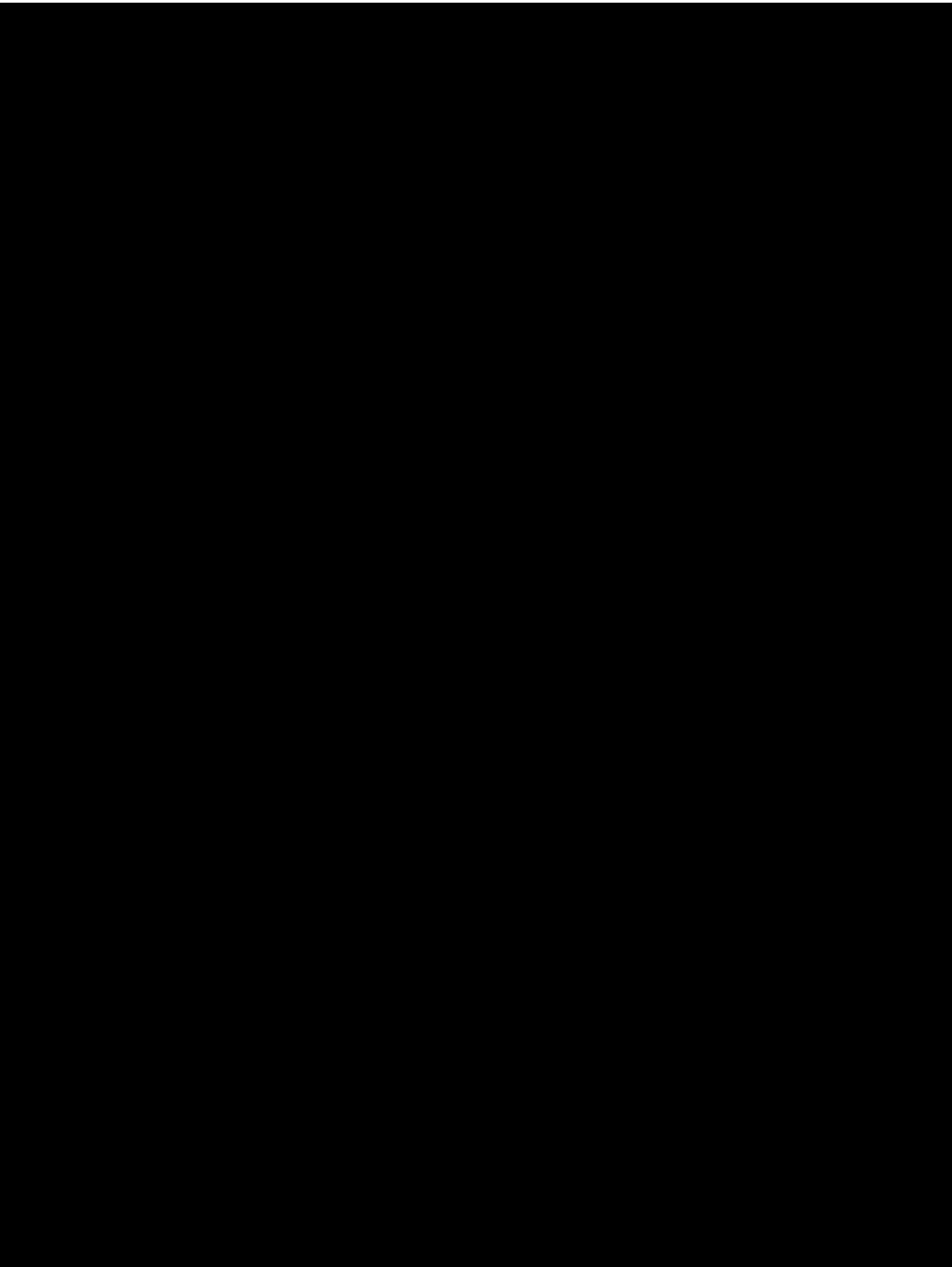


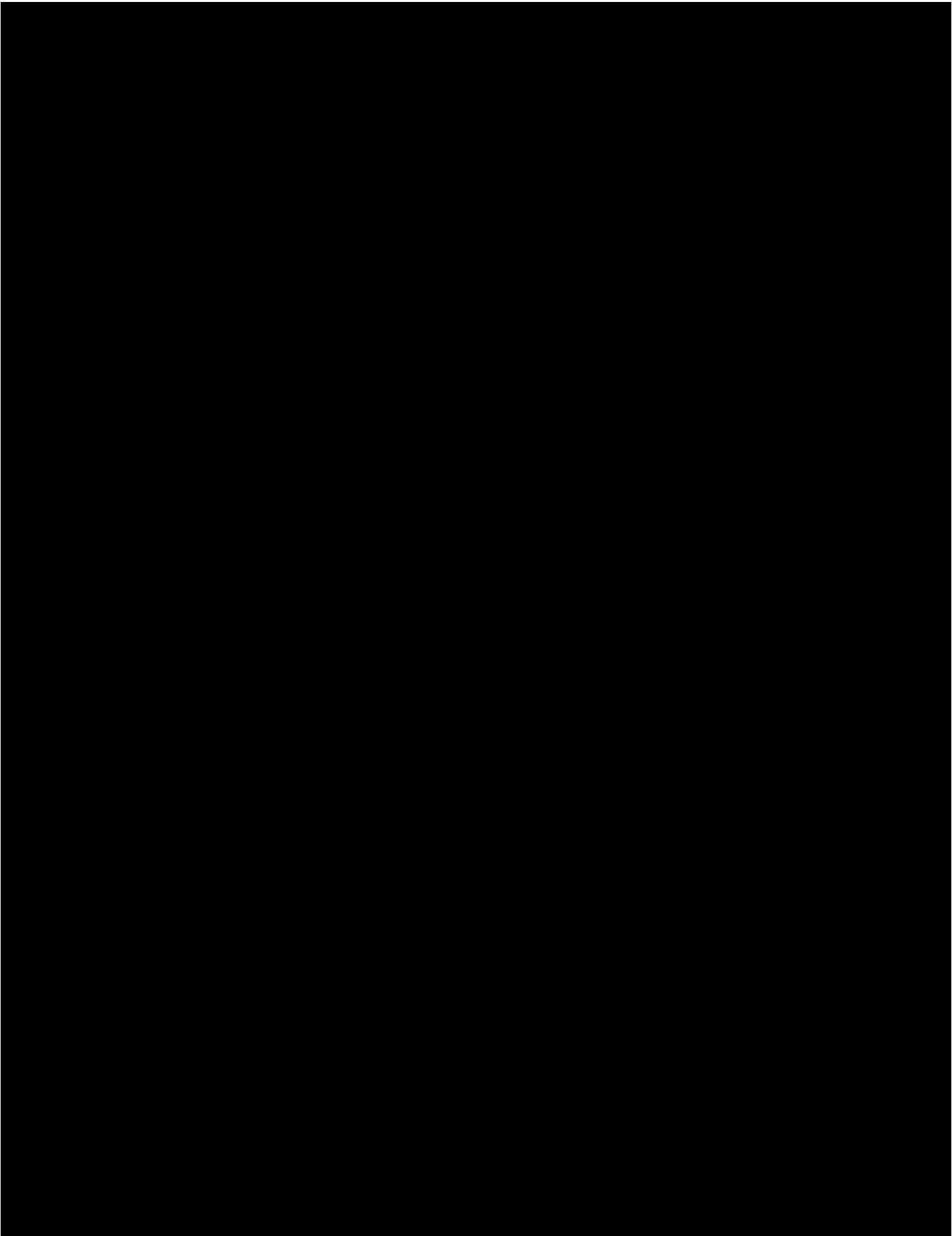
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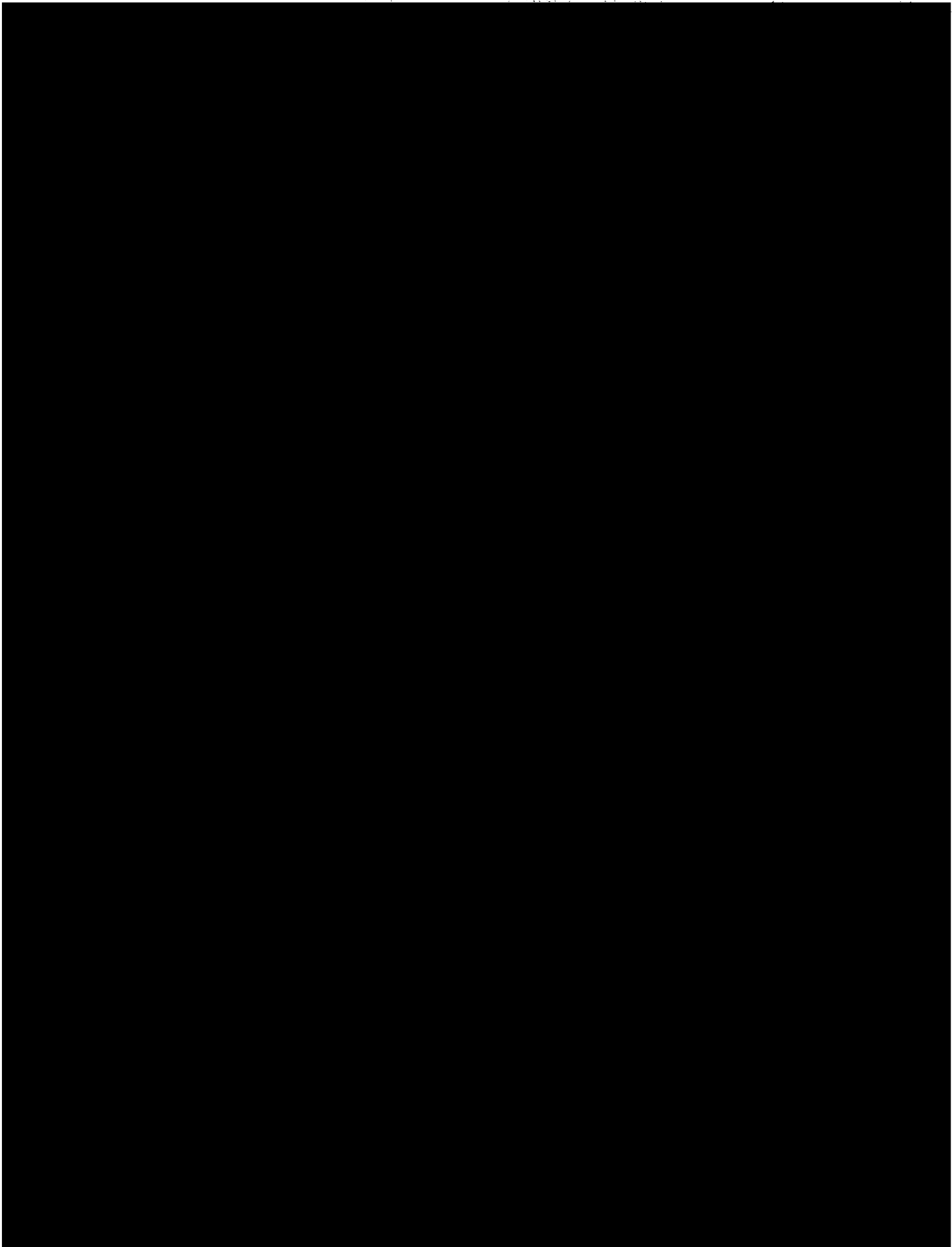




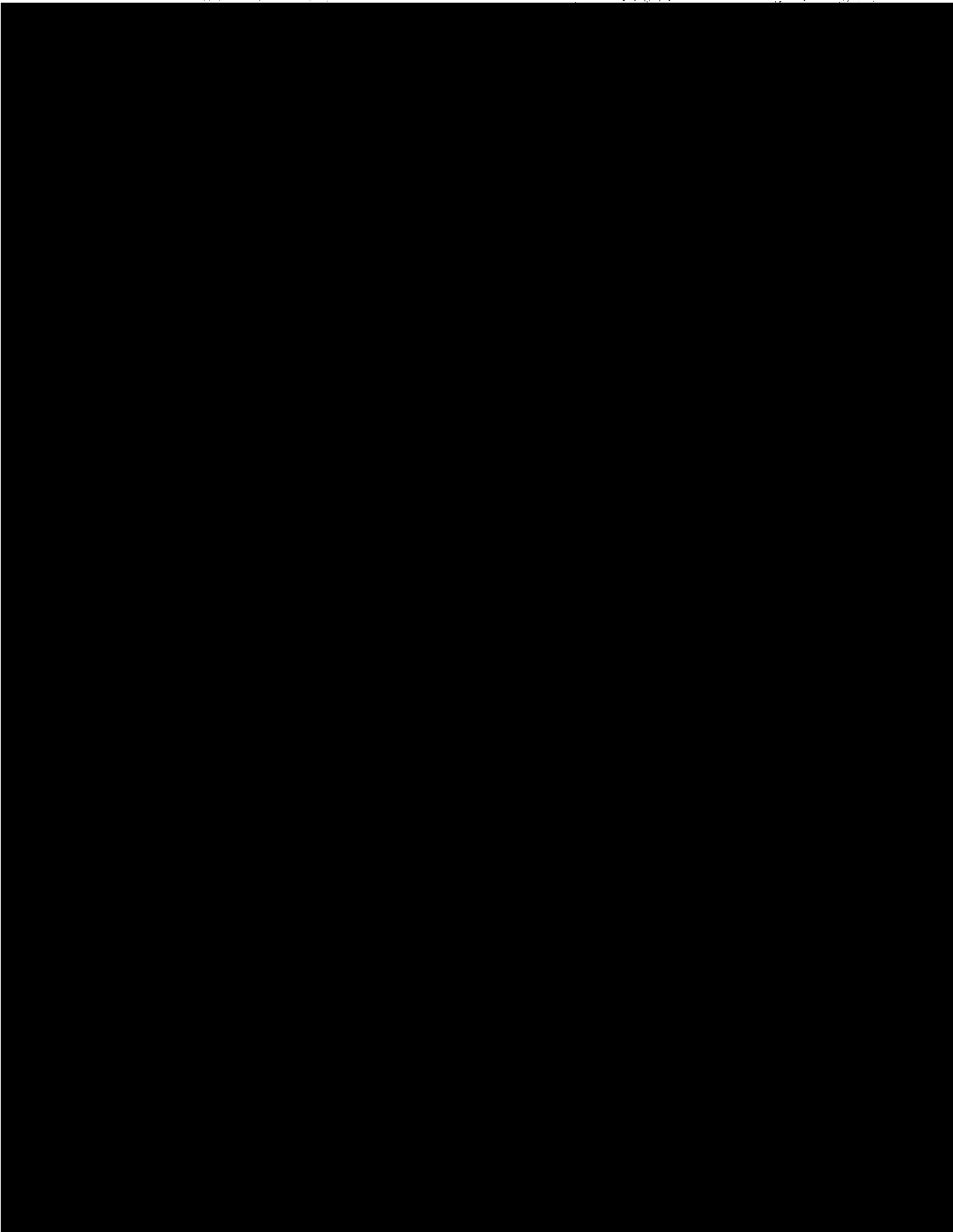
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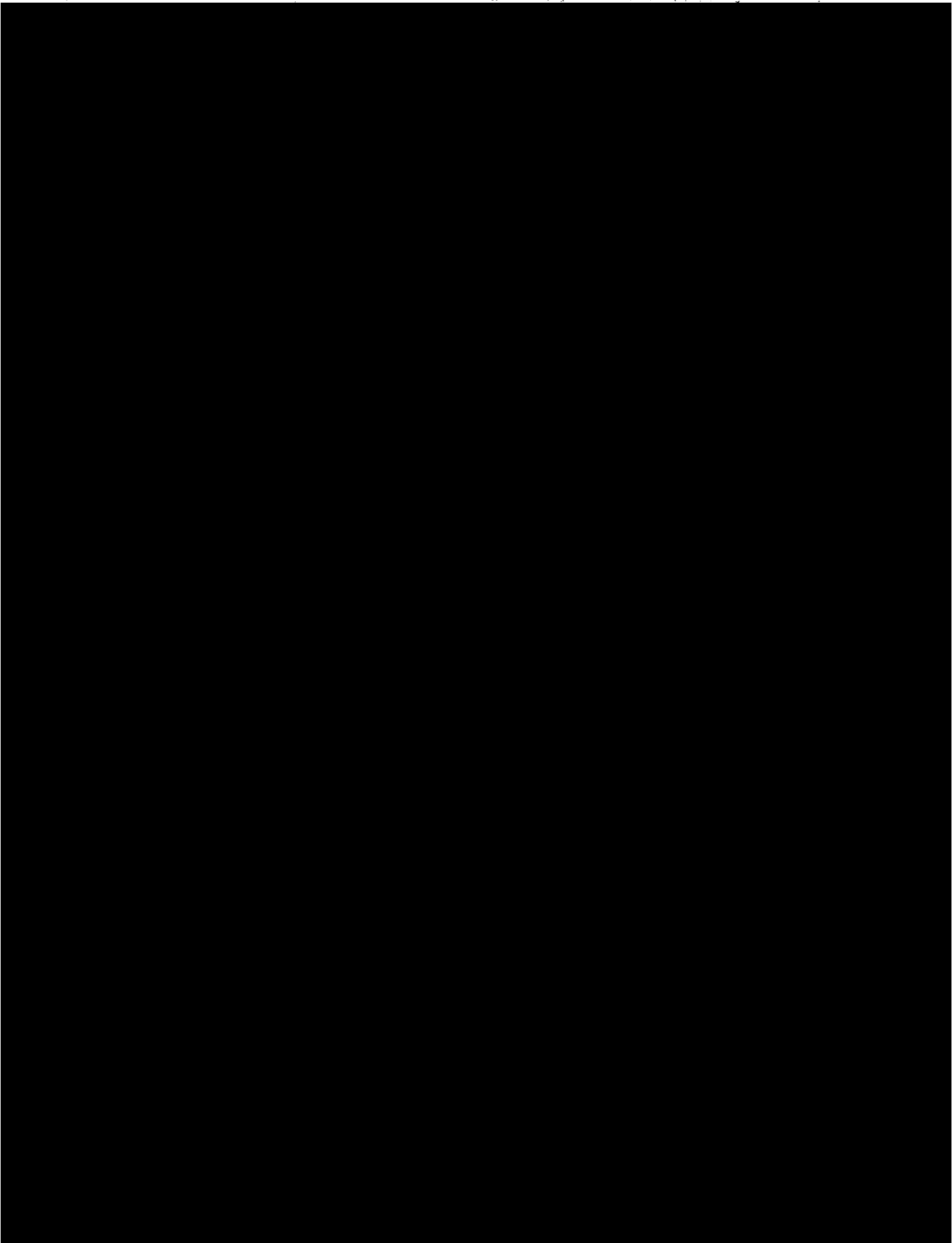


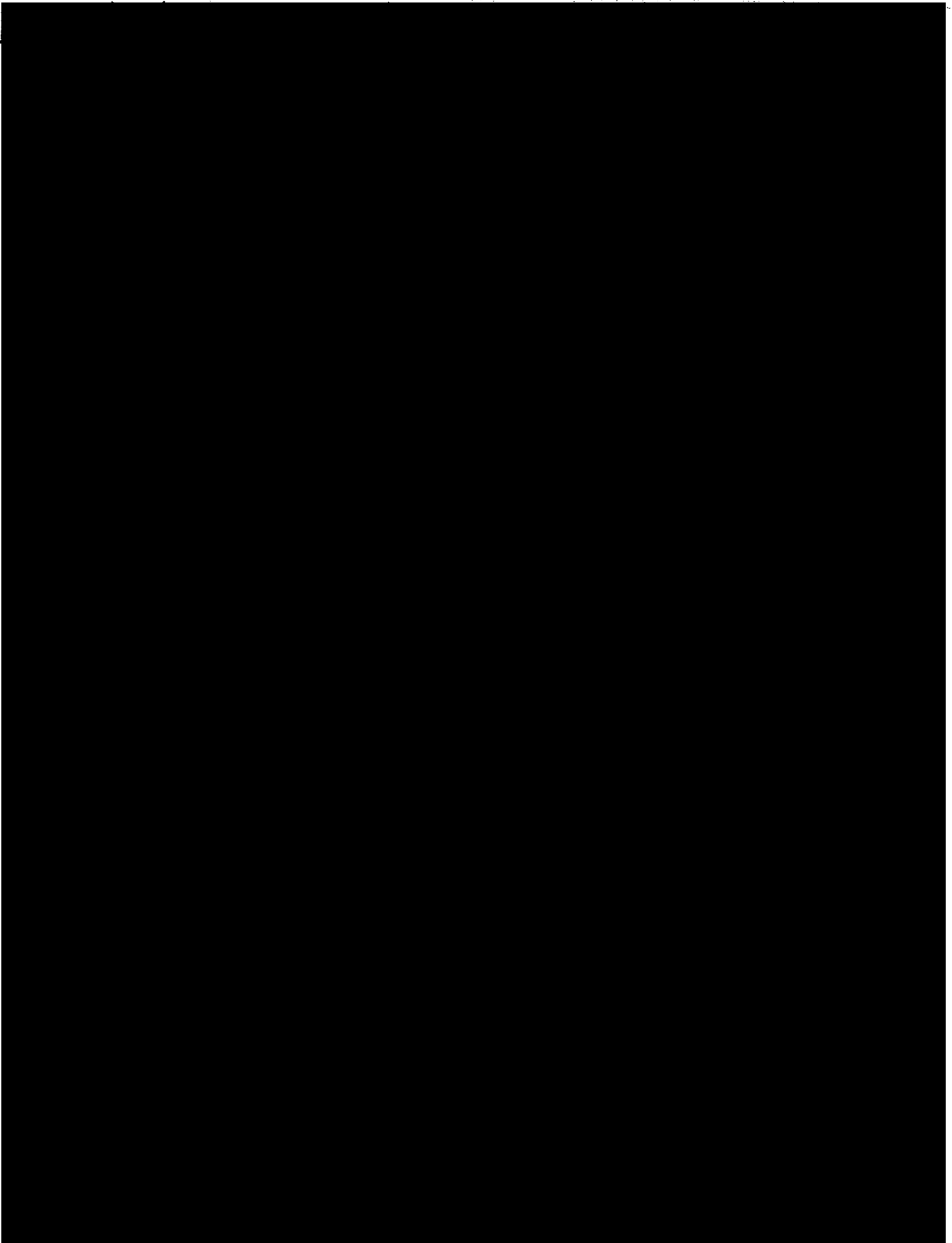


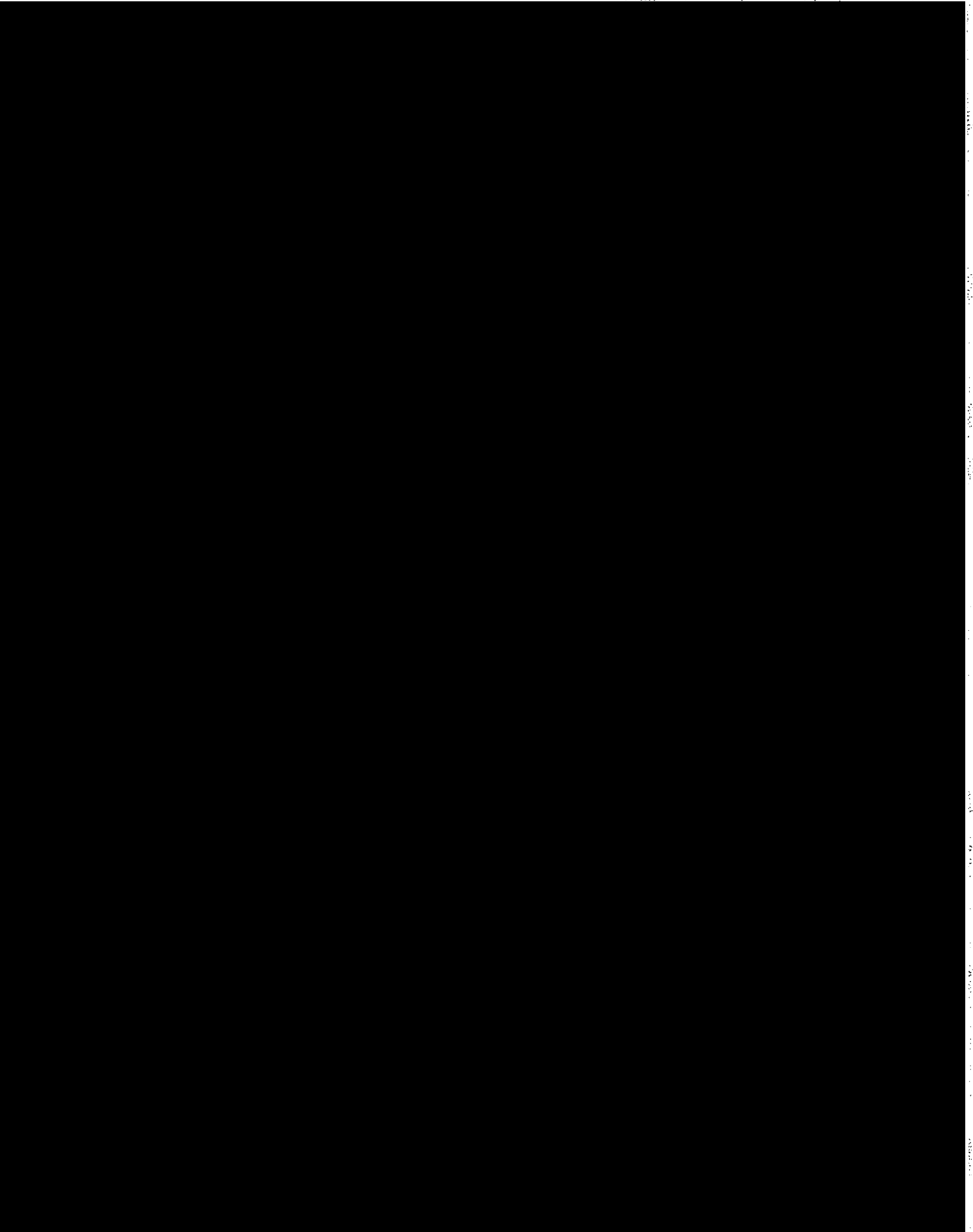
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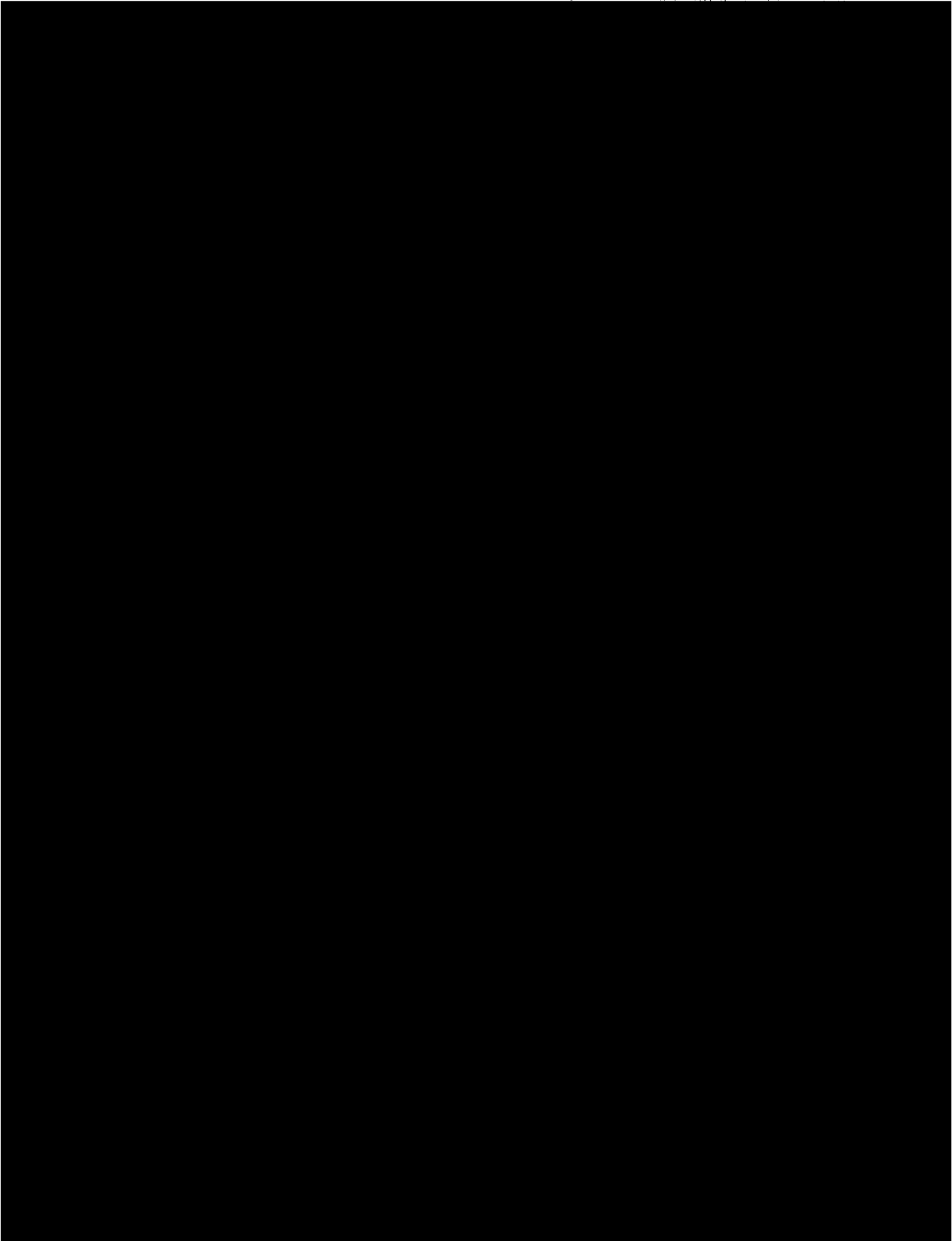


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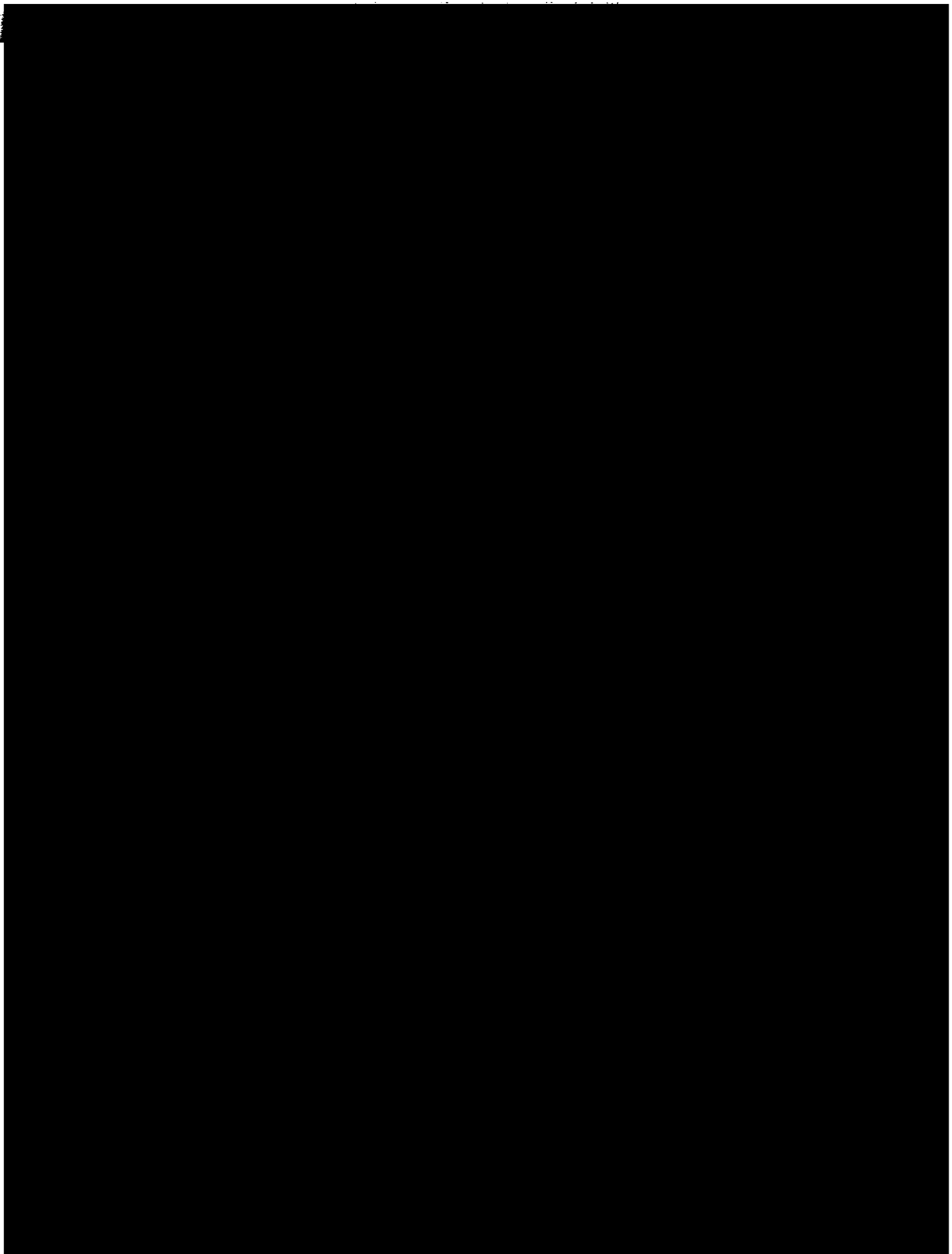








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