Data Evaluation Report on the acute toxicity of Penoxsulam on the Algae, *Selenastrum capricornutum*
PMRA Submission #:{.....} EPA MRID #: 45834805

Data Requirement:

PMRA DATA CODE	{.....}
EPA DP Barcode	D288160
OECD Data Point	{.....}
EPA MRID	45834805
EPA Guideline	123-2

Test material: Penoxsulam Purity: 97.5%
Common name: XDE-638
Chemical name: IUPAC: Benzenesulfonamide,2-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[pyrimidin-2-yl)-6-(trifluoromethyl)
CAS name: Not reported
CAS No.: Not reported
Synonyms: Not reported

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Date: {.....}

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
EPA PC Code ~~199031~~ 119031

Date Evaluation Completed: {dd-mmm-yyyy}

CITATION: H.D. Kirk, M.M Gilles, E.L. McClymont, and L.G. McFadden. 2000. Effects of XDE-638 on the Growth of the freshwater green alga, *Selenastrum capricornutum* PRINTZ. Unpublished study performed by Toxicology & Environmental Research and Consulting, The Dow Chemical Company, Midland, Michigan. Laboratory Project Identification No. 991177. Study submitted by Dow AgroSciences, LLC, Indianapolis, Indiana. Experimental start date was July 19, 1999 and the experimental termination date was July 23, 1999. The final report issued January 7, 2000.

EXECUTIVE SUMMARY:

In a 96-hour acute toxicity study, cultures of *Selenastrum capricornutum* were exposed to Penoxsulam, as XDE-638, under static conditions. The nominal concentrations were 0 (negative and solvent controls), 4.69, 9.38, 18.8, 37.5, 75, 150, and 300 µg a.i./. The mean measured concentrations were 4.62, 11.3, 14.6, 34.9, 74.3, 122, and 233 µg a.i./L. The 96-hour cell density percent inhibitions were 9.7, 10.1, 16.2, 20.6, 34.6, 44.2, 58.3, and 75.5% for the 4.62, 11.3, 14.6, 34.9, 74.3, 122, and 233 µg a.i./L treatment groups, respectively. The solvent control had 9.7% inhibition compared to the negative (dilution water) control. Cell density was significantly reduced at treatment levels equal to and greater than 11.3 µg a.i./L. The cell density EC_{50} was 92.0 µg a.i./L, the EC_{05} was 6.5 µg a.i./L, and the NOAEC was 4.62 µg a.i./L.

The study is scientifically sound and satisfies the U.S. EPA Guideline Subdivision J, §123-2 for an aquatic nonvascular plant study with *Selenastrum capricornutum*. This study is classified as Core.

Results Synopsis

Test Organism: *Selenastrum capricornutum*
Test Type: Static

Cell Density:
NOAEC: 4.62 µg a.i./L
EC_{05}: 6.5 µg a.i./L 95% C.I.: 3.2-13 µg a.i./L
EC_{50}: 92 µg a.i./L 95% C.I.: 74-110 µg a.i./L
Slope: 1.42±0.150

Growth rate:
NOAEC/EC_{05}: Not reported
EC_{50}: 10,615 µg a.i./L 95% C.I.: Not reported

Area Under the Growth Curve (Biomass, percent inhibition):
NOAEC/EC_{05}: Not reported
EC_{50}: 106 µg a.i./L 95% C.I.: 40.2-277 µg a.i./L

Endpoint(s) Affected: cell density

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The test was based on the following guideline: U.S. EPA-FIFRA Pesticide Assessment Guidelines, Subdivision J, Hazard Evaluation: Nontarget Plants Guideline 123-2, Growth and Reproduction of Aquatic Plants Tier 2. The following deviation from U.S. EPA Guideline, §123-2 was noted:

1. The values of pH at test initiation and termination were not specified, but a range was reported.

This deviation did not affect the acceptability or the validity of the study.

COMPLIANCE: Signed and dated GLP, Quality Assurance and No Data Confidentiality statements were provided. The study was conducted according to U.S. EPA, OECD, and EC standards.

A. MATERIALS:

1. Test Material Penoxsulam, XDE-638

Description: Pink, solid powder

Lot No./Batch No. : ND05167938

Purity: 97.5%

Stability of Compound
Under Test Conditions: The mean measured concentrations of XDE-638 were 78.0-142% of nominal at hour 0 and 71.3-116% of nominal at hour 96 (Table 3, pp. 26-27). The 96 hour recoveries were 70.6-142% of hour 0 recoveries.

(OECD requires water solubility, stability in water and light, pKa, Pow, vapor pressure of test compound)

Storage conditions of test chemicals: Not reported

2. Test organism:
Name: *Selenastrum capricornutum*

EPA requires a nonvascular species: For tier I testing, only one species, S. capricornutum, to be tested; for tier II testing, S. costatum, A. flos-aquae, S. capricornutum, and a freshwater diatom is tested

OECD suggests the following species are considered suitable: S. capricornutum, S. subspicatus, and C. vulgaris. If other species are used, the strain should be reported

Strain: 1648
Source: Originally from Starr Algal Collection at the University of Texas, Austin, Texas. Current in-house laboratory cultures.
Age of inoculum: 5 days old
Method of cultivation: Algal Assay Medium (Appendix A, p. 41).

B. STUDY DESIGN:

a) Range-finding Study: A 96-hour range-finding study with XDE-638 was conducted in order to estimate the nominal test concentrations for the definitive study. The range-finder test concentrations ranged from 9.4 to 300 µg a.i./L. The 96-hour EC_{50} value and NOAEC were reported as 104 µg a.i./L and 19.6 µg a.i./L, respectively.

b) Definitive Study

Table 1 . Experimental Parameters

Parameter	Details	Remarks *Criteria*
Acclimation period:	Continuous	Inoculum used in test was taken from stock culture and transferred to fresh medium 5 days before testing.
culturing media and conditions: (same as test or not)	Algal Assay Medium (Appendix A, p. 41); same as test, except for chelant used in cultures.	*EPA recommends two week acclimation period.*
health: (any toxicity observed)	Not reported	*OECD recommends an amount of algae suitable for the inoculation of test cultures and incubated under the conditions of the test and used when still exponentially growing, normally after an incubation period of about 3 days. When the algal cultures contain deformed or abnormal cells, they must be discarded.*
Test system static/static renewal: renewal rate for static renewal:	Static	
Incubation facility	Incubator	
Duration of the test	96 hours	*EPA requires: 96 - 120 hours* *OECD: 72 hours*
Test vessel material: (glass/polystyrene) size: fill volume:	Borosilicate Erlenmeyer flasks 250 mL 100 mL	*OECD recommends 250 ml conical flasks are suitable when the volume of the test solution is 100 ml or use a culturing apparatus.*

Parameter	Details	Remarks *Criteria*
Details of growth medium name: pH at test initiation: pH at test termination: Chelator used: Carbon source: Salinity **(for marine algae):**	 Algal Assay Medium 6.9-7.6 (during entire test) Not reported No $NaHCO_3$ N/A	The values of pH at test initiation and termination were not reported. *OECD recommends the medium pH after equilibration with air is ~8 with less than .001 mmol/l of chelator if used.* *EPA recommends 20X-AAP medium.*
If non-standard nutrient medium was used, detailed composition provided (Yes/No)	N/A	
Dilution water source: type: pH: salinity **(for marine algae):** water pretreatment (if any): Total Organic Carbon: particulate matter: metals: pesticides: chlorine:	 Deionized water Not reported 7.0-7.5 N/A None Not reported Not reported Not reported Not detected Not reported	*EPA pH: Skeletonema costatum= ~8.0 Others = ~7.5 from beginning to end of the test. EPA salinity: 30-35 ppt. EPA is against the use of dechlorinated water.* *OECD: pH is measured at beginning of the test and at 72 hours, it should not normally deviate by more than one unit during the test.*
Indicate how the test material is added to the medium (added directly or used stock solution)	Stock solutions	
Aeration or agitation	Agitation, 100 rpm	*EPA recommends agitation only for Selenastrum at 100 cycles per min and Skeletonema at ~60 cycles per min. Aeration is not recommended.*
Initial cells density	Approximately 10,000 cells/mL (actual range: 3,691-14,765 cells/mL)	*EPA requires an initial number of 3,000 - 10,000 cells/mL. For Selenastrum capricornutum, cell counts on day 2 are not required.* *OECD recommends that the initial cell concentration be approximately*

Parameter	Details	Remarks *Criteria*
		10,000 cells/ml for S. capricornutum and S. subspicatus. When other species are used the biomass should be comparable.
Number of replicates control: solvent control: treated ones:	 3 3 3	Three replicates with plants, one replicate without plants. *EPA requires a negative and/or solvent control with 3 or more replicates per doses. Navicula sp. tests should be conducted with four replicates.* *OECD preferably three replicates at each test concentration and ideally twice that number of controls. When a vehicle is used to solubilize the test substance, additional controls containing the vehicle at the highest concentration used in the test cultures should be included in the test.*
Test concentrations nominal: measured:	 0 (negative and solvent controls), 4.69, 9.38, 18.8, 37.5, 75, 150, and 300 µg a.i./L 2-40 µg a.i./L (LOQ, controls), 4.62, 11.3, 14.6, 34.9, 74.3, 122, and 233 µg a.i./L	The day 0 LOQ was 40 µg a.i./L and the day 4 LOQ was 2 µg a.i./L. *EPA requires at least 5 test concentrations, with each at least 60% of the next higher one.* *OECD recommends at least five concentrations arranged in a geometric series, with the lowest concentration tested should have no observed effect on the growth of the algae. The highest concentration tested should inhibit growth by at least 50% relatively to the control and, preferably, stop growth completely.*
Solvent (type, percentage, if used)	Acetone, 100 µL/L	
Method and interval of analytical verification	HPLC; 0 and 96 hours	
Test conditions temperature:	 25.3-25.4°C	*EPA temperature: Skeletonema:*

Parameter	Details	Remarks *Criteria*
photoperiod: light intensity and quality:	Continuous 3230-5400 lux	*20 °C, Others: 24-25 °C; EPA photoperiod: S. costatum 14 hr light/ 10 hr dark, Others: Continuous; EPA light: Anabaena: 2.0 Klux (±15%), Others: 4 - 5 Klux (±15%)* *OECD recommended the temperature in the range of 21 to25°C maintained at ± 2°C and continuous uniform illumination provided at approximately 8000 Lux measured with a spherical collector.*
Reference chemical {if used) name: concentrations:	N/A	
Other parameters, if any	None	

2. Observations:

Table 2: Observation parameters

Parameters	Details	Remarks/Criteria
Parameters measured including the growth inhibition/other toxicity symptoms	Cell count (area under the growth curve and growth rates were calculated).	*EPA recommends the growth of the algae expressed as the cell count per mL, biomass per volume, or degree of growth as determined by spectrophotometric means.*
Measurement technique for cell density and other end points	Electron particle counting using a Coulter Multisizer.	*EPA recommends the measurement technique of cell counts or chlorophyll a* *OECD recommends the electronic particle counter, microscope with counting chamber, fluorimeter, spectrophotometer, and colorimeter.*

Parameters	Details	Remarks/Criteria
		(note: in order to provide useful measurements at low cell concentrations when using a spectrophotometer, it may be necessary to use cuvettes with a light path of at least 4 cm).
Observation intervals	Every 24 hours	Observations were not conducted every 24 hours. *EPA and OECD: every 24 hours.*
Other observations, if any	None	
Indicate whether there was exponential growth in the control	Yes, dilution water group cell densities at test termination was 140.7X greater than the dilution water control group cell densities at test initiation.	*EPA requires control cell count at termination to be ≥2X initial count or by a factor of at least 16 during the test.* *OECD: cell concentration in control cultures should have increased by a factor of at least 16 within three days.*
Were raw data included?	Yes	

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

The 96-hour cell density percent inhibitions were 9.7, 10.1, 16.2, 20.6, 34.6, 44.2, 58.3, and 75.5% for the 4.62, 11.3, 14.6, 34.9, 74.3, 122, and 233 mg a.i./L treatment groups, respectively. The solvent control had 9.7% inhibition compared to the negative (dilution water) control.

Table 3: Effect of Penoxsulam, XDE-638, on Algae (*Selenastrum capricornutum*)

Treatment mean measured and nominal concentrations [a] (µg a.i./L)	Initial cell density (cells/mL)	Mean Cell density (cells/mL) at		
		24 hours	96 hours	
			cell count	% inhibition
Dilution water control	7534	32337	1060157	--
Solvent control	5675	33998	957742	9.7
4.62 (4.69)	5180	32034	952561	10.1
11.3 (9.38)	6488	31339	888315	16.2
14.6 (18.8)	5586	29747	842261	20.6
34.9 (37.5)	6338	31522	693774	34.6
74.3 (75.0)	6843	28578	591618	44.2
122 (150)	10296	23720	442233	58.3
233 (300)	5075	20475	259843	75.5
Reference chemical	N/A	N/A	N/A	N/A

[a] The nominal test concentrations are presented in parentheses.

Table 4: Effect of Penoxsulam, XDE-638, on the Algae *Selenastrum capricornutum*

Mean Measured and Nominal Treatment Concentrations [a] (µg a.i./L)	Initial cell density (cells/mL)	Mean Growth Rate per day	% inhibition (Mean Growth Rate per day)	Mean Area Under Growth Curve	% inhibition (Mean Area Under Growth Curve)
Dilution water control	7534	NR	NR	NR	NR
Solvent control	5675	NR	NR	NR	NR
4.62 (4.69)	5180	NR	NR	NR	NR
11.3 (9.38)	6488	NR	NR	NR	NR
14.6 (18.8)	5586	NR	NR	NR	NR
34.9 (37.5)	6338	NR	NR	NR	NR
74.3 (75.0)	6843	NR	NR	NR	NR

Mean Measured and Nominal Treatment Concentrations [a] (µg a.i./L)	Initial cell density (cells/mL)	Mean Growth Rate per day	% inhibition (Mean Growth Rate per day)	Mean Area Under Growth Curve	% inhibition (Mean Area Under Growth Curve)
122 (150)	10296	NR	NR	NR	NR
233 (300)	5075	NR	NR	NR	NR
Reference chemical	N/A	N/A	N/A	N/A	N/A

[a] The nominal test concentrations are presented in parentheses. NR-Not Reported

Table 5: Statistical endpoint values.

Statistical Endpoint	Biomass (percent inhibition)	Growth rate	Cell density
NOAEC or EC_{05} (µg a.i./L)	NR	NR	11.3
EC_{50} (µg a.i./L)	106	10,615	86.4
IC_{50} or EC_{50} (µg a.i./L) (95% C.I.)	40.2-277	NR	33.6-223
IC_{25}/EC_{25} (µg a.i./L) (95% C.I.)	NR	NR	20.7 (8.08-52.8)
Reference chemical, if used NOAEC IC_{50}/EC_{50}	N/A	N/A	N/A

NR-Not Reported
N/A = Not applicable.

B. REPORTED STATISTICS:

Statistical Method: The EC_{25} and EC_{50} values were calculated using least squares linear regression for algal cell counts. The NOAEC was determined using analysis of variance and the Dunnett's t-test. All statistical calculations were performed using the mean measured concentrations.

Cell Density:
$NOAEC/EC_{05}$: 11.3 µg a.i./L
EC_{50}: 86.4 µg a.i./L 95% C.I.: 33.6-638 µg a.i./L

Growth rate:
$NOAEC/EC_{05}$: Not reported
EC_{50}: 10,615 µg a.i./L 95% C.I.: Not reported

Area Under the Growth Curve (Biomass, percent inhibition):
NOAEC/EC_{05}: Not reported
EC_{50}: 106 µg a.i./L 95% C.I.: 40.2-277 µg a.i./L

Endpoint(s) Affected: cell density

C. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Cell density data satisfied the assumptions of ANOVA. The negative and solvent controls were compared using a Student's t-test and, upon finding no difference, the two were pooled for comparison to treatment. The NOAEC was determined using this test, followed by William's multiple comparison test via TOXSTAT statistical software. The EC_x values were determined using the Probit method via Nuthatch statistical software. Results could not be verified for biomass or growth rate, as replicate data were not provided. The reviewer used the mean measured concentrations to calculate toxicity values.

Cell Density:
NOAEC: 4.62 µg a.i./L
EC_{05}: 6.5 µg a.i./L 95% C.I.: 3.2-13 µg a.i./L
EC_{50}: 92 µg a.i./L 95% C.I.: 74-110 µg a.i./L
Slope: 1.42 ± 0.150

D. STUDY DEFICIENCIES:

The deviation was minor, so it did not affect the acceptability or validity of the study.

E. REVIEWER'S COMMENTS:
The reviewer's toxicity values for cell density differed from those of the study authors. Because the reviewer's EC_{50} estimate was associated with a narrower 95% confidence interval, it is reported in the Executive Summary and Conclusions sections (as is the reviewer's NOAEC estimate).

F. CONCLUSIONS: The study is scientifically sound and satisfies the guidelines for an aquatic nonvascular plant study with *Selenastrum capricornutum* [§123-2]. This study is classified as Core. Cell density was significantly reduced at treatment levels equal to and greater than 11.3 µg a.i./L. The cell density EC_{50} was 92.0 µg a.i./L and the NOAEC was 4.62 µg a.i./L.

Cell Density:
NOAEC: 4.62 µg a.i./L
EC_{05}: 6.5 µg a.i./L 95% C.I.: 3.2-13 µg a.i./L
EC_{50}: 92 µg a.i./L 95% C.I.: 74-110 µg a.i./L
Slope: 1.42 ± 0.150

Growth rate:
NOAEC/EC_{05}: Not reported
EC_{50}: 10,615 µg a.i./L 95% C.I.: Not reported

Area Under the Growth Curve (Biomass, percent inhibition):
NOAEC/EC_{05}: Not reported

EC_{50}: 106 µg a.i./L 95% C.I.: 40.2-277 µg a.i./L

Endpoint(s) Affected: cell density

III. REFERENCES:

Holst, R.W. and T.C. Ellwanger, 1982, Pesticide Assessment Guidelines Subdivision J Hazard Evaluation: Non-target Plants, EPA 540/9-82-020, Washington, D.C.

Holst, R.W., 1986, Hazard Evaluation Division: Standard Evaluation Procedure Non-Target Plants: Growth and Reproduction of Aquatic Plants Tiers 1 and 2. EPA 540/9-86-134, Washington, D.C.

Organization of Economic Cooperation and Development (OECD). OECD Guideline for Testing of Chemicals. Algal Growth, Inhibition Test. Number 201. Adopted 7 June, 1984.

Environmental Protection Agency-FIFRA GLPs. Title 40 CFR, 160-Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Good Laboratory Practice Standards, Final Rule.

OECD Series on Principles of Good Laboratory Practice Compliance and Monitoring, Number 1. OECD Principles on Good Laboratory Practice (as revised in 1997) ENV/MC/CHEM(98)17.

EC Directive 99/11/EC of 8 March 1999 (OJ No. L 77/8-21, 23/3/1999).

Smith, A.J., "Certificate of Analysis for Test/Reference/Control/Substances Analytical Report FA & PC Number 993090. 20 May, 1999.

A.J. Smith, Purity Report for XDE-638, FA &PC 993090, May 20, 1999.

Miller, W.E., Green, J.C. and Shiroyama, T. (1978). The *Selenastrum capricornutum* Printz Algal Assay Bottle Test. EPA-600/9-78-018.5.

Kirk, H.D. and Gilles, M.M., "Phase Two Aquatic Screening of the Experimental Sulfonamide XR-638 with the Freshwater Green Alga, *Selenastrum capricornutum* Printz." Report 980324. The Dow Chemical Company. 27 August, 1998.

Neter, J., Wasserman, W. and Kutner, M.H. (1983). Applied Linear Regression Models. Richard D. Irwin Inc., Homewood, Illinois.

Winer, B.J. (1971). Statistical Principles on Experimental Design. 2nd Ed., McGraw Hill, Co. New York, New York.

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:
cell density
File: 4805cd Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	7	1682495151742.000	240356450248.750	34.287
Within (Error)	19	133193629408.000	7010191021.477	
Total	26	1815688781150.000		

Critical F value = 2.54 (0.05,7,19)
Since F > Critical F REJECT Ho:All groups equal

cell density
File: 4805cd Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	1004449.833	1004449.833		
2	4.62	952560.667	952560.667	0.876	
3	11.3	888315.000	888315.000	1.962	
4	14.6	842261.333	842261.333	2.739	*
5	34.9	693773.667	693773.667	5.248	*
6	74.3	591618.333	591618.333	6.973	*
7	122	442232.667	442232.667	9.496	*
8	233	259843.333	259843.333	12.577	*

Bonferroni T table value = 2.70 (1 Tailed Value, P=0.05, df=19,7)

cell density
File: 4805cd Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	4.62	3	159672.776	15.9	51889.167
3	11.3	3	159672.776	15.9	116134.833

4	14.6	3	159672.776	15.9	162188.500
5	34.9	3	159672.776	15.9	310676.167
6	74.3	3	159672.776	15.9	412831.500
7	122	3	159672.776	15.9	562217.167
8	233	3	159672.776	15.9	744606.500

cell density
File: 4805cd Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	6	1004449.833	1004449.833	1004449.833
2	4.62	3	952560.667	952560.667	952560.667
3	11.3	3	888315.000	888315.000	888315.000
4	14.6	3	842261.333	842261.333	842261.333
5	34.9	3	693773.667	693773.667	693773.667
6	74.3	3	591618.333	591618.333	591618.333
7	122	3	442232.667	442232.667	442232.667
8	233	3	259843.333	259843.333	259843.333

cell density
File: 4805cd Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG	TABLE P=.05 WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	1004449.833				
4.62	**952560.667**	**0.876**		**1.73**	**k= 1, v=19**
11.3	888315.000	1.962	*	1.81	k= 2, v=19
14.6	842261.333	2.739	*	1.84	k= 3, v=19
34.9	693773.667	5.248	*	1.85	k= 4, v=19
74.3	591618.333	6.973	*	1.86	k= 5, v=19
122	442232.667	9.496	*	1.87	k= 6, v=19
233	259843.333	12.577	*	1.87	k= 7, v=19

s = 83726.884
Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound
		Lower	Upper	/Estimate	
EC5	**6.5**	**3.2**	**13.**	**0.15**	**0.49**
EC10	12.	6.5	21.	0.12	0.56
EC25	31.	21.	46.	0.082	0.68
EC50	**92.**	**74.**	**1.1E+02**	**0.046**	**0.80**

Slope = 1.42 Std.Err. = 0.150

Goodness of fit: p = 0.74 based on DF= 5.0 19.

4805CD : cell density

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	1.00e+06	9.91e+05	1.31e+04	100.	0.00
4.62	3.00	9.53e+05	9.60e+05	-7.09e+03	96.8	3.20
11.3	3.00	8.88e+05	8.95e+05	-6.87e+03	90.3	9.70
14.6	3.00	8.42e+05	8.65e+05	-2.31e+04	87.3	12.7
34.9	3.00	6.94e+05	7.20e+05	-2.61e+04	72.6	27.4
74.3	3.00	5.92e+05	5.48e+05	4.32e+04	55.3	44.7
122.	3.00	4.42e+05	4.28e+05	1.47e+04	43.1	56.9
233.	3.00	2.60e+05	2.81e+05	-2.09e+04	28.3	71.7