

Analytical method for DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in water

- Reports:**
- ECM 1:** EPA MRID No. 49599604. Hill, S.J., A.M. Pentz and J.J. Stry. 2003. Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (Indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in Ground, Surface, and Drinking Waters Using LC/MS/MS. DuPont Study No.s: DuPont-9605 and DuPont-9605, Revision No. 1. Report prepared by E.I. du Pont de Nemours and Company, Newark, Delaware; sponsored and submitted by E.I. du Pont de Nemours and Company, Wilmington, Delaware (p. 4); 78 pages. Final report with Revision No. 1 issued March 3, 2003. Original report authored by S.J. Hill and J.J. Stry issued May 2, 2002.
- ECM 2:** EPA MRID No. 49599605. Stry, J.J. 2014. Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (Indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in Ground, Surface, and Drinking Waters Using LC/MS/MS. DuPont Study No.: DuPont-9605, Supplement No. 1. Report prepared by E.I. du Pont de Nemours and Company, Newark, Delaware; sponsored and submitted by E.I. du Pont de Nemours and Company, Wilmington, Delaware (p. 4); 42 pages. Final report with Supplement No. 1 issued September 15, 2014. Final report with Revision No. 1 authored by S.J. Hill, A.M. Pentz and J.J. Stry. issued March 3, 2003. Original report authored by S.J. Hill and J.J. Stry issued May 2, 2002.
- ILV:** EPA MRID No. 49599606. Moi, J.G.J. 2003. Independent Laboratory Validation of DuPont-9605, Revision 1 “Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 In Ground, Surface, and Drinking Waters Using LC/MS/MS”. DuPont Study Project ID: DuPont-12182. TNO Project No.: 010.53090. TNO Study Code: 5033/02. Report prepared by TNO Nutrition and Food Research, Zeist, The Netherlands; sponsored and submitted by E.I. du Pont de Nemours and Company, Wilmington, Delaware (p. 3); 77 pages. Final report issued May 20, 2003.
- Document No.:** MRIDs 49599604 & 49599605 & 49599606
- Guideline:** 850.6100
- Statements:** ECM 1: The study was not conducted with the restriction of compliance with USEPA FIFRA (40 CFR, Part 160) or OECD Good Laboratory Practice (GLP) standards; however, Standard Operating Procedures were followed (p. 3 of MRID 49599604). Signed and dated Data Confidentiality, No Data Confidentiality, GLP, and Certification of Authenticity statements were provided (pp. 2-4). A Quality Assurance statement was not provided.
ECM 2: The study was not conducted with the restriction of compliance with USEPA FIFRA (40 CFR, Part 160) or OECD GLP standards; however, work was done in a GLP facility following Standard Operating Procedures (p. 3 of MRID 49599605). Signed and dated Data Confidentiality, No Data Confidentiality, GLP, and Certification of Authenticity statements were provided (pp. 2-4). A Quality Assurance statement was not provided.

ILV: The study was conducted in compliance with OECD GLP standards (p. 3 of MRID 49599606). Signed and dated Data Confidentiality, No Data Confidentiality, GLP and Quality Assurance Certification of statements were provided (pp. 2-4). Authenticity statements were included with the GLP and QA statements.

Classification: This analytical method is classified as **Acceptable** (MRIDs 49599604 and 49599606). Only ECM 1 was validated by the ILV, not ECM 2. An updated ECM to include the ILV modifications to increase the robustness of the method should be submitted. Several RSDs were >20% in the studies. In the ILV, linearity was not satisfactory for most of the IN-MS775 linear regressions. Most of the water matrices were not characterized in the ECMs and ILV. Reagent blanks were not included in the ECMs and ILV. MRID 49599605 is classified as **Unacceptable** without independent laboratory validation.

PC Code: 067710

Reviewer: Lewis Ross Brown, III
Environmental Biologist

Signature: *Lewis Ross Brown, III*
Date: March 16, 2016

Executive Summary

This analytical method, DuPont Study No. DuPont-9605, Revision No. 1 (ECM 1), is designed for the quantitative determination of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in surface, ground and drinking water at the LOQ (0.050 µg/L) using LC/MS/MS. The LOQ is less than the lowest toxicological level of concern in water for all analytes (3.6 µg/L). In the ECM, all analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS. Quantification of analytes was performed with either total ion count or the quantitative ion transition. DuPont-9605, Supplement No. 1 (ECM 2) supported ECM 1 with quantification and confirmation ion transition data for each analyte with no other modification to the method. The surface (pond and river) water, ground (well) water and drinking (bottled) water matrices were the same between the two ECMs, but were not characterized. In the ILV, only one parent-daughter ion transition was monitored for each analyte. DPX-MP062, IN-JT333 and IN-MP819 were analyzed using LC APCI-LC/MS/MS. IN-MS775, IN-JU873 and IN-KG433 were analyzed using LC ESI-LC/MS/MS. The ILV was performed to validate ECM 1, since ECM 2 was not provided to the ILV due to study timeframes. The ILV validated ECM 1 with the first trial for DPX-MP062, IN-JT333, MP819 and IN-JU873. The ILV validated the method for IN-KG433 in the second trial with the use of freshly prepared solutions and the addition of acetic acid to the acetonitrile solvent to improve stability. The ILV validated the method for IN-MS775 in the third trial with the addition of acetic acid to the acetonitrile component of the LC gradient and the injection of calibration standards in between sample sets to improve the accuracy of the measurements. The ILV water matrices were surface (river) water, ground (well) water and drinking (tap) water, and only the surface water was characterized. The ILV study authors suggested minor modifications to ECM 1 to increase the applicability and success of the method; an updated ECM to include these minor, but essential, modifications should be submitted. Several RSDs were >20% in the studies: ECM 1, IN-MP819 (LOQ, surface water) and DPX-MP062 (10×LOQ, drinking water); ECM 2 (quantitation ion), IN-MS775 and IN-MP819 (LOQ, surface water) and DPX-MP062 (10×LOQ drinking water); and ILV,

IN-MS775 (LOQ, surface water). Overall, the method of ECM 1 was shown to be reproducible by the ILV for all analytes/matrices with a few minor modifications, except for IN-MS775 in the surface water matrix. The method of ECM 2 supported the ECM 1 with acceptable confirmation ion data, but was not validated by the ILV.

Table 1. Analytical Method Summary

| Analyte(s) by Pesticide | MRID | | EPA Review | Matrix | Method Date (dd/mm/yyyy) | Registrant | Analysis | Limit of Quantitation (LOQ) |
|--|--------------------------------------|---|---------------|----------------------|-------------------------------|--|---|-----------------------------------|
| | Environmental Chemistry Method | Independent Laboratory Validation | | | | | | |
| DPX-MP062 [Indoxacarb (DPX- KN128) & IN-KN127] | 49599604 | 49599606 | | Water ^{1,2} | 02/05/2002 Original report | E.I. du Pont de Nemours and Company | LC/MS/MS | 0.050 µg/L (0.05 ppb) |
| IN-MS775 | | | | | 03/03/2003 Rev. 1 | | | |
| IN-JT333 | | | | | | | | |
| IN-MP819 | | | | | | | | |
| IN-JU873 | | | | | | | | |
| IN-KG433 | | | | | | | | |
| DPX-MP062 [Indoxacarb (DPX- KN128) & IN-KN127] | 49599605 | None | | Water ^{1,2} | 02/05/2002 Original report | E.I. du Pont de Nemours and Company | LC/MS/MS with confirmatory ions monitored | |
| IN-MS775 | | | | | 03/03/2003 Rev. 1 | | | |
| IN-JT333 | | | | | | | | |
| IN-MP819 | | | | | 15/09/2014 Supp. 1 | | | |
| IN-JU873 | | | | | | | | |
| IN-KG433 | | | | | | | | |

1 In the ECM, Sassafras water (sandy loam; 8% clay; 1.7% organic matter), Drummer water (silt loam; 18% clay; 3.9% organic matter) and Goose River Sediment (clay loam; 29% clay; 3.2% organic matter) were used (p. 13 of MRID 49599604). The sources were only identified as field test sites located in the USA.

2 In the ILV, 88 NJ 01 Nascna water (loam; 28% sand, 47% silt, 25% clay; 2.0% organic matter) and Goose River Sediment (clay loam; 28% sand, 39% silt, 33% clay; 6.0% organic matter) were used (p. 15 of MRID 49599606). The sources were only identified as field test sites located in the USA.

3 In the ECMs, all analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS. Water matrices were not characterized (p. 15 of MRID 49599604). Surface waters were obtained from Lums Pond in Bear, Delaware and Brandywine River in Wilmington, Delaware. The ground water was obtained from Kemblesville Well in Kemblesville, Pennsylvania. The drinking water was bottled water purchase from a local grocery store (ACME; Pine Valley Spring, New Ringgold, Pennsylvania). The same water matrices were used for both ECMs.

4 In the ILV, DPX-MP062, IN-JT333 and MP819 were analyzed using LC APCI-LC/MS/MS, while IN-MS775, IN-JU873 and IN-KG433 were analyzed using LC ESI-LC/MS/MS. The water matrices were drinking water (tap water, Zeist), ground water (Netherlands, sample 699/04/1593) and surface water (local river/channel, Netherlands, sample 0699/05/0024; p. 12 of MRID 49599606). The surface water was characterized by Alcontrol, The Netherlands (pH 7.9, total organic carbon 36 mg/L; pp. 9, 12). The ground and drinking water were not characterized.

I. Principle of the Method

Samples (40.0 mL \pm 1%) were measured into 50-mL centrifuge tubes and fortified, as necessary (pp. 16-17 of MRID 49599604). The samples were acidified with 40 μ L of acetic acid, then extracted with 10.0 mL (\pm 1%) of acetonitrile via shaking vigorously. The percent acetonitrile was adjusted to 20%, if necessary, using water or acetonitrile. The sample was purified using a SPE column (12-cc, 0.5-g Oasis HLB cartridge) which was pre-conditioned with 5 mL of methanol followed by 10 mL of HPLC grade water (do not let the cartridge go to dryness). The sample was loaded and allowed to pass through the column at a flow rate of 2-5 mL/min. The centrifuge tube was rinsed with 10 mL of acetonitrile:water (30:70, v:v), and the rinse was passed through the column just before the sample passed through completely. The column was dried for 5 minutes, then rinsed with 5 mL of hexane which was used to rinse the centrifuge tube. The hexane was passed through the column with vacuum, and the column was dried for 5 minutes. The eluate was discarded. The centrifuge tube was rinsed with 25 mL of acetonitrile and loaded directly onto the column. Vacuum may be applied to start flow, but should be turned off once flow has started. Collect the acetonitrile eluate into a 40-mL glass centrifuge tube. The extract was evaporated to *ca.* 100 μ L using nitrogen in an N-Evap at 35°C. The residue was reconstituted with 1 mL of acetonitrile via vortex for 30 seconds and sonication for 5 minutes. The extract was diluted with 1 mL of water using a pipette. Using a disposable pipette, the extract was transferred into an HPLC vial and analyzed by reversed-phase LC/MS/MS.

The ECM study authors noted that the extracts would be stable for *ca.* 72 hours if stored at 4°C (p. 17 of MRID 49599604). The study authors also noted that, if the extracts were being stored longer than 72 hours at 4°C, 10 μ L of acetic acid should be added to reduce degradation.

Samples were analyzed for DPX-MP062 and all metabolites, except IN-MP819, using an Agilent HP1100 HPLC coupled to Micro-mass Quattro II LC ESI-LC/MS/MS mass spectrometer (pp. 11, 18-21; Appendix 4, pp. 71-78 of MRID 49599604). The reversed-phase HPLC/MS/MS conditions consisted of a C18 Luna Phenomenex column (4.6 x 150 mm, 3- μ m, column temperature 30°C), a mobile phase gradient of (A) 0.01 M aqueous acetic acid and (B) acetonitrile [percent A:B (v:v) at 0.0-0.5 min. 70:30, 4.0 min. 35:65, 12.0-15.0 min. 5:95, 15.1 min. 70:30], and MS/MS detection in positive ion mode with Multiple Reaction Monitoring (MRM). Two or three parent-daughter ion transitions were monitored for each analyte: m/z 528.0 \rightarrow 292.9, m/z 528.0 \rightarrow 217.8 and m/z 528.0 \rightarrow 202.9 for DPX-MP062; m/z 411.9 \rightarrow 208.8 and m/z 411.9 \rightarrow 190.8 for IN-MS775; m/z 470.0 \rightarrow 149.8, **m/z 470.0 \rightarrow 266.9** and m/z 470.0 \rightarrow 206.9 for IN-JT333; m/z 458.0 \rightarrow 149.0, **m/z 458.0 \rightarrow 204.8** and m/z 458.0 \rightarrow 254.8 for IN-JU873; and m/z 516.0 \rightarrow 220.9 and **m/z 516.0 \rightarrow 280.8** for IN-KG433 (all transitions were \pm 0.5 amu; quantitation ion transitions were **bolded**, as noted in study report). Retention times were 10.7, 12.1, 10.8, 9.5 and 8.2 minutes for DPX-MP062, IN-MS775, IN-JT333, IN-JU873 and IN-KG433, respectively. Injection volume was 0.100 mL.

Samples were analyzed for IN-MP819 using an Agilent HP1100 HPLC coupled to Micro-mass Quattro II LC APcI-LC/MS/MS mass spectrometer (pp. 11, 18-21; Appendix 4, pp. 71-78 of MRID 49599604). The reversed-phase HPLC/MS/MS conditions consisted of a C18 Luna Phenomenex column (4.6 x 150 mm, 3- μ m, column temperature 30°C), a mobile phase gradient of (A) 0.01 M aqueous formic acid and (B) acetonitrile [percent A:B (v:v) at 0.0-0.5 min. 50:50, 9.0-12 min. 2:98, 12.5 min. 50:50], and MS/MS detection in positive ion mode with Multiple Reaction Monitoring (MRM). Two parent-daughter ion transitions were monitored for IN-MP819: m/z 238.5 \rightarrow 194.2

and m/z **238.5** → **131.2** (all transitions were ± 0.5 amu; quantitation ion transitions were **bolded**, as noted in study report). Retention time was 10.3 minutes for IN-MP819. Injection volume was 0.100 mL.

For quantification in the ECM with Rev. 1 (ECM 1), DPX-MP062 and IN-MS775 were quantified using total ion count (TIC; pp. 20-21 of MRID 49599604). All other analytes were quantified using the **bolded** ion transitions listed above. The relative ratios of the fragment ions were evaluated for confirmation of identity of the analytes.

The study authors of the ECM with Rev. 1 (ECM 1) and Supplemental ECM (ECM 2) noted the following special precautions when following the method: samples were diluted with acetonitrile due to the tendency of DPX-MP062 and IN-JT333 to adhere to glass surfaces when in water; and the pH must be adjusted to 4 for acceptable recoveries, especially for IN-KG433 and IN-JU873 (p. 24 of MRID 49599604; p. 10 of MRID 49599605). The Supplemental ECM study author also noted surface area of SPE column should be minimized (no reservoirs or adapters).

The purpose of the Supplemental ECM (ECM 2) was to add second ion confirmation ion data for the DPX-MP062 and its metabolites (pp. 9-10). The sample extraction and instrumental analysis were the same as the ECM with Rev. 1 (MRID 49599604). Two ion transitions were monitored for each analyte, a quantitative and confirmatory. Monitored ion transitions in the Supplemental ECM were as follows: m/z **528.0** → **217.8** and m/z 528.0 → 202.9 for DPX-MP062; m/z **411.9** → **208.8** and m/z 411.9 → 190.8 for IN-MS775; m/z 470.0 → 149.8 and m/z **470.0** → **266.9** for IN-JT333; m/z 458.0 → 149.0 and m/z **458.0** → **204.8** for IN-JU873; m/z 516.0 → 220.9 and m/z **516.0** → **280.8** for IN-KG433; and m/z 238.5 → 194.2 and m/z **238.5** → **131.2** for IN-MP819 (all transitions were ± 0.5 amu; quantitation ion transitions were **bolded**, the confirmation ion transitions were in plain text; pp. 11-12 of MRID 49599605).

In the ILV, DuPont Study No. DuPont-9605, Revision No. 1 (ECM 1) was performed as written, except that the hexane rinse step of the SPE column was not performed, acetic acid was added to diluted stock solutions and extracts of the third validation to prevent degradation or adsorption of analytes, a Shimadzu LC coupled with a PE Sciex API3000 mass spectrometer was used as the analytical instrument, and all analytes but IN-MS775 and IN-MP819 were measured both by LC-APCI-MS/MS and LC-ESI-MS/MS analyses (IN-MS775 and IN-MP819 were only measured by one analysis; pp. 11, 15-17 of MRID 49599606). The instrumental conditions for LC-APCI-MS/MS were generally the same as those of the ECM, but the mobile phase gradient was (A) 0.01 M aqueous formic acid and (B) acetonitrile [percent A:B (v:v) at 0.0-0.5 min. 50:50, 9.0-12 min. 2:98, 12.5-16 min. 50:50]. Also, only one ion transition was monitored for each analyte: m/z 528 → 218 for DPX-MP062; m/z 467 → 150 for IN-JT333; m/z 458 → 255 for IN-JU873; m/z 516 → 281 for IN-KG433; and m/z 238 → 131 for IN-MP819. The instrumental conditions for LC-ESI-MS/MS were generally the same as those of the ECM, but, in the third attempt, the mobile phase components were altered to (A) 0.01 M aqueous acetic acid and (B) acetonitrile with 10 mM of acetic acid. Also, only one ion transition was monitored for each analyte: m/z 528 → 293 for DPX-MP062; m/z 412 → 209 for IN-MS775; m/z 470 → 267 for IN-JT333; m/z 458 → 149 for IN-JU873; and m/z 516 → 281 for IN-KG433. The injection volume was increased to 0.200 mL for LC-APCI-MS/MS and LC-ESI-MS/MS analyses. Retention times were not reported and could not be determined from the provided chromatograms (Annex V5033/02 B03, pp. 33-56).

In both the ECMs and ILV, the LOQ for all analytes was reported as 0.05 µg/L (pp. 8, 23-24 of MRID 49599604; pp. 8, 13 of MRID 49599605; pp. 10, 23 of MRID 49599606). The LOD for all analytes was estimated as 0.02 µg/L in the ECMs and ILV.

II. Recovery Findings

ECM 1 (MRID 49599604): Mean recoveries and relative standard deviations (RSD) were within guidelines (mean 70-120%; RSD ≤20%) for analysis of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127], IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in surface, ground and drinking water at the LOQ (0.05 µg/L) and 10×LOQ (0.50 µg/L), except for LOQ recovery results of IN-MP819 in surface (river) water (21.1% RSD) and the 10×LOQ recovery results of DPX-MP062 in drinking (bottled) water (20.1% RSD; uncorrected recovery results; Table 1, pp. 28-31; DER Attachment 2). Standard deviations were reviewer-calculated for DPX-MP062 and IN-MS775, since only means and RSDs were provided in the study report. For all other analytes, the standard deviations were calculated by the study author of ECM 2, the Supplemental ECM MRID 49599605 (the individual recovery results for the quantification ion of IN-JT333, IN-MP819, IN-JU873 and IN-KG433 were the exact same; Table 1, pp. 28-31 of MRID 49599604; Table 1, pp. 15-18 of MRID 49599605). However, in several instances, all reported statistics were reviewer-calculated based on all five recovery values (n = 5) since the study authors calculated the statistics for the LOQ or 10×LOQ recovery results with the exclusion of one outlier per sample set (n = 4; see Table 2 below for details). DPX-MP062 and IN-MS775 were quantified using total ion count (TIC; pp. 19-21). All other analytes were quantified using the quantitation ion transition only. All analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS. Confirmation of analyte identification was performed by the calculation of the ion ratios (Appendix 3, pp. 65-70). Calculations allowed for recoveries to be corrected when residues were quantified in the controls; however, no residues were quantified in the controls (pp. 21-22; Table 1, pp. 28-31). The water matrices were not characterized (p. 15 of MRID 49599604). Surface waters were obtained from Lums Pond in Bear, Delaware and Brandywine River in Wilmington, Delaware. The ground water was obtained from Kemblesville Well in Kemblesville, Pennsylvania. The drinking water was bottled water purchase from a local grocery store (ACME; Pine Valley Spring, New Ringgold, Pennsylvania).

ECM 2 (MRID 49599605): Mean recoveries and relative standard deviations (RSD) were within guidelines (mean 70-120%; RSD ≤20%) for analysis of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127], IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in surface, ground and drinking water at the LOQ (0.05 µg/L) and 10×LOQ (0.50 µg/L), except for LOQ quantitation ion recovery results of IN-MS775 and IN-MP819 in surface (river) water (21.4% and 21.1% RSD, respectively) and the 10×LOQ quantitation ion recovery results of DPX-MP062 in drinking (bottled) water (21.0% RSD; uncorrected recovery results; Tables 1-2, pp. 15-22; DER Attachment 2). In several instances, all reported statistics were reviewer-calculated based on all five recovery values (n = 5) since the study authors calculated the statistics for the LOQ or 10×LOQ recovery results with the exclusion of one outlier per sample set (n = 4; see Table 2 below for details). All analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS (pp. 10-12). Two parent-daughter ion transitions were monitored. The results of both ion transitions were reported for all analytes; the results were generally comparable. Calculations allowed for recoveries to be corrected when residues were quantified in the controls; however, no residues were quantified in the controls (pp. 21-22 of MRID

49599604; Tables 1-2, pp. 15-22 of MRID 49599605). The water matrices were the same as those of MRID 49599604; no new information was provided (based on data matching and source identification).

ILV (MRID 49599606): Mean recoveries and relative standard deviations (RSD) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127], IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in surface, ground and drinking water at the LOQ (0.05 μ g/L) and 10 \times LOQ (0.50 μ g/L), except for LOQ recovery results of IN-MS775 in surface (river) water (30.7% RSD; uncorrected recovery results; pp. 20-21; Annex V5033/02 B07, pp. 64-69; DER Attachment 2). Standard deviations were reviewer-calculated for all analytes, since only means and RSDs were provided in the study report. for LOQ recovery results of IN-MS775 in surface (river) water, all reported statistics were reviewer-calculated based on all five recovery values (n = 5) since the study authors calculated the statistics for the LOQ recovery results with the exclusion of one outlier per sample set (n = 4; see Table 2 below for details). The reviewer noted that the recovery results for IN-JT333 and IN-MP819 were exactly the same for the LOQ and 10 \times LOQ sample sets in drinking water (Annex V5033/02 B07, pp. 64-69; see Table 2 below). Only one parent-daughter ion transition was monitored for each analyte; no confirmation method was employed. DPX-MP062 and IN-MS775 were quantified with one ion transition, not TIC. DPX-MP062, IN-JT333 and IN-MP819 were analyzed using LC APCI-LC/MS/MS. IN-MS775, IN-JU873 and IN-KG433 were analyzed using LC ESI-LC/MS/MS. The water matrices were drinking water (tap water, Zeist), ground water (Netherlands, sample 699/04/1593) and surface water (local river/channel, Netherlands, sample 0699/05/0024; p. 12). The surface water was characterized by Alcontrol, The Netherlands (pH 7.9, total organic carbon 36 mg/L; pp. 9, 12). The ground and drinking water were not characterized. The method was validated for DPX-MP062, IN-JT333, IN-JU873 and MP819 with the first trial (p. 25). The method was validated for IN-KG433 in the second trial with the use of freshly prepared solutions and the addition of acetic acid to the acetonitrile solvent to improve stability. The method was validated for IN-MS775 in the third trial with the addition of acetic acid to the acetonitrile component of the LC gradient and the injection of calibration standards in between sample sets to improve the accuracy of the measurements. The ILV was performed to validate ECM 1 (MRID 49599604), since ECM 2 (MRID 49599605) was not provided to the ILV due to study timeframes (p. 1 of MRID 49599604; p. 1 of MRID 49599605; pp. 1, 26 of MRID 49599606).

Table 2. Initial Validation Method Recoveries for DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433, in Water¹

| Analyte | Fortification Level (µg/L) | Number of Tests | Recovery Range (%) | Mean Recovery (%) | Standard Deviation (%) | Relative Standard Deviation (%) |
|---|----------------------------|-----------------|--------------------|-------------------|------------------------|---------------------------------|
| ECM with Rev. 1 - MRID 49599604 (Total Ion Count or Quantitation Ion Only)² | | | | | | |
| Surface (Pond) Water (Lums Pond, DE) | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 ³ | 79-85 | 82 | 2.8 | 3.4 |
| | 0.50 | 5 ³ | 80-100 | 92 | 7.7 | 8.3 |
| IN-MS775 | 0.050 (LOQ) | 5 ³ | 77-88 | 82 | 3.9 | 4.7 |
| | 0.50 | 5 ³ | 77-100 | 90 | 8.9 | 9.8 |
| IN-JT333 ⁴ | 0.050 (LOQ) | 5 | 72-85 | 81 | 5.4 | 6.6 |
| | 0.50 | 5 | 81-102 | 92 | 7.8 | 8.5 |
| IN-MP819 ⁴ | 0.050 (LOQ) | 5 | 91-102 | 98 | 4.5 | 4.6 |
| | 0.50 | 5 | 111-119 | 114 | 3.5 | 3.1 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 77-91 | 83 | 6.1 | 7.4 |
| | 0.50 | 5 | 80-103 | 92 | 9.0 | 9.7 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 74-87 | 81 | 5.1 | 6.3 |
| | 0.50 | 5 | 83-101 | 92 | 6.7 | 7.3 |
| Surface (River) Water (Brandywine River) | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 ³ | 72-113 | 92 | 16.9 | 18.3 |
| | 0.50 | 5 ³ | 79-108 | 98 | 11.7 | 13.1 |
| IN-MS775 | 0.050 (LOQ) | 5 ³ | 86-103 | 94 | 6.6 | 7.0 |
| | 0.50 | 5 ³ | 78-95 | 84 | 6.5 | 7.8 |
| IN-JT333 ⁴ | 0.050 (LOQ) | 5 | 93-110 | 101 | 6.1 | 6.0 |
| | 0.50 | 5 | 79-107 | 94 | 10.8 | 11.5 |
| IN-MP819 ⁴ | 0.050 (LOQ) | 5 | 72-118 | 92 | 19.4 | 21.1 |
| | 0.50 | 5 | 76-104 | 95 | 11.5 | 12.2 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 87-105 | 96 | 6.5 | 6.7 |
| | 0.50 | 5 | 80-104 | 93 | 8.9 | 9.6 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 88-121 | 104 | 12.1 | 11.6 |
| | 0.50 | 5 | 93-132 | 102 | 17.0 | 16.6 |
| Ground (Well) Water (Kemblesville Well) | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 ³ | 83-107 | 96 | 9.6 | 8.9 |
| | 0.50 | 5 ³ | 95-105 | 99 | 3.9 | 4.0 |
| IN-MS775 | 0.050 (LOQ) | 5 ³ | 88-106 | 95 | 7.4 | 7.8 |
| | 0.50 | 5 ³ | 86-105 | 93 | 7.2 | 7.8 |
| IN-JT333 ⁴ | 0.050 (LOQ) | 5 | 91-111 | 102 | 7.9 | 7.7 |

| | | | | | | |
|--|-------------|----------------|---------|-----|------|-------------|
| | 0.50 | 5 | 94-107 | 97 | 6.3 | 6.5 |
| IN-MP819 ⁴ | 0.050 (LOQ) | 5 | 86-102 | 96 | 7.5 | 7.8 |
| | 0.50 | 5 | 78-105 | 90 | 10.9 | 12.2 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 87-114 | 101 | 11.8 | 11.6 |
| | 0.50 | 5 | 90-109 | 97 | 7.4 | 7.6 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 88-107 | 95 | 7.2 | 7.6 |
| | 0.50 | 5 | 95-105 | 99 | 4.0 | 4.1 |
| Drinking Water (Bottled Water) | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 ³ | 103-114 | 110 | 4.6 | 4.5 |
| | 0.50 | 5 ³ | 91-152 | 114 | 23.0 | 20.1 |
| IN-MS775 | 0.050 (LOQ) | 5 ³ | 92-116 | 102 | 8.8 | 8.6 |
| | 0.50 | 5 ³ | 98-122 | 104 | 10.0 | 9.6 |
| IN-JT333 ⁴ | 0.050 (LOQ) | 5 | 105-109 | 107 | 2.2 | 2.1 |
| | 0.50 | 5 | 93-119 | 103 | 10.2 | 9.8 |
| IN-MP819 ⁴ | 0.050 (LOQ) | 5 | 88-101 | 94 | 6.0 | 6.4 |
| | 0.50 | 5 | 71-110 | 90 | 16.1 | 17.9 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 102-120 | 110 | 6.5 | 5.9 |
| | 0.50 | 5 ⁵ | 97-142 | 115 | 16.7 | 14.5 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 95-113 | 106 | 7.6 | 7.2 |
| | 0.50 | 5 ⁵ | 92-137 | 112 | 16.7 | 14.8 |
| Supplemental ECM - MRID 49599605 (Quantitation and Confirmation Ions)⁶ | | | | | | |
| Surface (Pond) Water (Lums Pond, DE) | | | | | | |
| Quantitation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 79-99 | 86 | 8.8 | 10.2 |
| | 0.50 | 5 | 78-101 | 93 | 9.7 | 10.4 |
| IN-MS775 | 0.050 (LOQ) | 5 | 69-91 | 81 | 8.4 | 10.3 |
| | 0.50 | 5 | 76-102 | 89 | 10.5 | 11.7 |
| IN-JT333 | 0.050 (LOQ) | 5 | 72-85 | 81 | 5.4 | 6.6 |
| | 0.50 | 5 | 81-102 | 92 | 7.8 | 8.5 |
| IN-MP819 | 0.050 (LOQ) | 5 | 91-102 | 98 | 4.5 | 4.6 |
| | 0.50 | 5 | 111-119 | 114 | 3.5 | 3.1 |
| IN-JU873 | 0.050 (LOQ) | 5 | 77-91 | 83 | 6.1 | 7.4 |
| | 0.50 | 5 | 80-103 | 92 | 9.0 | 9.7 |
| IN-KG433 | 0.050 (LOQ) | 5 | 74-87 | 81 | 5.1 | 6.3 |
| | 0.50 | 5 | 83-101 | 92 | 6.7 | 7.3 |
| Confirmation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 78-87 | 81 | 3.7 | 4.5 |
| | 0.50 | 5 | 82-98 | 92 | 6.0 | 6.5 |

| | | | | | | |
|--|-------------|----------------|---------|-----|------|-------------|
| IN-MS775 | 0.050 (LOQ) | 5 | 67-91 | 79 | 9.4 | 11.9 |
| | 0.50 | 5 | 71-96 | 83 | 9.4 | 11.3 |
| IN-JT333 | 0.050 (LOQ) | 5 | 66-90 | 77 | 11.4 | 14.9 |
| | 0.50 | 5 | 74-108 | 94 | 12.9 | 13.8 |
| IN-MP819 | 0.050 (LOQ) | 5 | 84-113 | 102 | 10.7 | 10.5 |
| | 0.50 | 5 | 118-130 | 123 | 4.5 | 3.7 |
| IN-JU873 | 0.050 (LOQ) | 5 | 74-89 | 79 | 6.3 | 8.0 |
| | 0.50 | 5 | 80-104 | 93 | 10.4 | 11.2 |
| IN-KG433 | 0.050 (LOQ) | 5 | 72-82 | 78 | 4.1 | 5.2 |
| | 0.50 | 5 | 83-102 | 92 | 7.5 | 8.1 |
| Surface (River) Water (Brandywine River) | | | | | | |
| Quantitation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 76-102 | 88 | 10.2 | 11.6 |
| | 0.50 | 5 | 87-111 | 98 | 9.5 | 9.7 |
| IN-MS775 | 0.050 (LOQ) | 5 ⁵ | 51-94 | 76 | 16.3 | 21.4 |
| | 0.50 | 5 | 66-96 | 84 | 11.4 | 13.7 |
| IN-JT333 | 0.050 (LOQ) | 5 | 93-110 | 101 | 6.1 | 6.0 |
| | 0.50 | 5 | 79-107 | 94 | 10.8 | 11.5 |
| IN-MP819 | 0.050 (LOQ) | 5 | 72-118 | 92 | 19.4 | 21.1 |
| | 0.50 | 5 | 76-104 | 95 | 11.5 | 12.2 |
| IN-JU873 | 0.050 (LOQ) | 5 | 87-105 | 96 | 6.5 | 6.7 |
| | 0.50 | 5 | 80-104 | 93 | 8.9 | 9.6 |
| IN-KG433 | 0.050 (LOQ) | 5 | 88-121 | 104 | 12.1 | 11.6 |
| | 0.50 | 5 | 93-132 | 102 | 17.0 | 16.6 |
| Confirmation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 83-106 | 94 | 10.7 | 11.4 |
| | 0.50 | 5 | 90-106 | 98 | 6.6 | 6.8 |
| IN-MS775 | 0.050 (LOQ) | 5 ⁵ | 55-96 | 81 | 15.5 | 19.1 |
| | 0.50 | 5 | 64-89 | 78 | 9.0 | 11.5 |
| IN-JT333 | 0.050 (LOQ) | 5 | 66-107 | 87 | 16.0 | 18.4 |
| | 0.50 | 5 | 81-97 | 91 | 6.4 | 7.1 |
| IN-MP819 | 0.050 (LOQ) | 5 | 66-97 | 79 | 11.9 | 15.2 |
| | 0.50 | 5 | 80-101 | 92 | 7.9 | 8.6 |
| IN-JU873 | 0.050 (LOQ) | 5 | 73-96 | 84 | 8.5 | 10.1 |
| | 0.50 | 5 | 86-96 | 91 | 4.4 | 4.9 |
| IN-KG433 | 0.050 (LOQ) | 5 | 79-101 | 89 | 8.3 | 9.3 |
| | 0.50 | 5 | 91-97 | 93 | 2.7 | 2.9 |
| Ground (Well) Water (Kemblesville Well) | | | | | | |
| Quantitation ion | | | | | | |

| | | | | | | |
|--|-------------|----------------|---------|-----|------|------|
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 90-104 | 98 | 5.5 | 5.6 |
| | 0.50 | 5 | 93-118 | 101 | 9.6 | 9.5 |
| IN-MS775 | 0.050 (LOQ) | 5 | 88-108 | 96 | 8.3 | 8.6 |
| | 0.50 | 5 | 86-108 | 93 | 8.8 | 9.5 |
| IN-JT333 | 0.050 (LOQ) | 5 | 91-111 | 102 | 7.9 | 7.7 |
| | 0.50 | 5 | 94-107 | 97 | 6.3 | 6.5 |
| IN-MP819 | 0.050 (LOQ) | 5 | 86-102 | 96 | 7.5 | 7.8 |
| | 0.50 | 5 | 78-105 | 90 | 10.9 | 12.2 |
| IN-JU873 | 0.050 (LOQ) | 5 | 87-114 | 101 | 11.8 | 11.6 |
| | 0.50 | 5 | 90-109 | 97 | 7.4 | 7.6 |
| IN-KG433 | 0.050 (LOQ) | 5 | 88-107 | 95 | 7.2 | 7.6 |
| | 0.50 | 5 | 95-105 | 99 | 4.0 | 4.1 |
| Confirmation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 90-105 | 96 | 5.8 | 6.1 |
| | 0.50 | 5 | 97-114 | 101 | 7.4 | 7.3 |
| IN-MS775 | 0.050 (LOQ) | 5 | 74-106 | 89 | 14.5 | 16.3 |
| | 0.50 | 5 | 86-102 | 93 | 5.8 | 6.2 |
| IN-JT333 | 0.050 (LOQ) | 5 | 94-99 | 96 | 2.1 | 2.2 |
| | 0.50 | 5 | 91-109 | 99 | 6.9 | 7.0 |
| IN-MP819 | 0.050 (LOQ) | 5 | 86-107 | 94 | 8.2 | 8.7 |
| | 0.50 | 5 | 80-106 | 96 | 13.3 | 13.9 |
| IN-JU873 | 0.050 (LOQ) | 5 | 87-113 | 101 | 11.3 | 11.2 |
| | 0.50 | 5 | 93-108 | 97 | 6.1 | 6.3 |
| IN-KG433 | 0.050 (LOQ) | 5 | 89-113 | 100 | 9.4 | 9.5 |
| | 0.50 | 5 | 94-106 | 98 | 4.9 | 5.0 |
| Drinking Water (Bottled Water) | | | | | | |
| Quantitation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 109-122 | 117 | 5.8 | 4.9 |
| | 0.50 | 5 ⁵ | 93-157 | 117 | 24.5 | 21.0 |
| IN-MS775 | 0.050 (LOQ) | 5 | 95-114 | 101 | 7.4 | 7.3 |
| | 0.50 | 5 | 100-126 | 105 | 11.6 | 11.1 |
| IN-JT333 | 0.050 (LOQ) | 5 | 105-109 | 107 | 2.2 | 2.1 |
| | 0.50 | 5 | 93-119 | 103 | 10.2 | 9.8 |
| IN-MP819 | 0.050 (LOQ) | 5 | 88-101 | 94 | 6.0 | 6.4 |
| | 0.50 | 5 | 71-110 | 90 | 16.1 | 17.9 |
| IN-JU873 | 0.050 (LOQ) | 5 | 102-120 | 110 | 6.5 | 5.9 |
| | 0.50 | 5 ⁵ | 97-142 | 115 | 16.7 | 14.5 |
| IN-KG433 | 0.050 (LOQ) | 5 | 95-113 | 106 | 7.6 | 7.2 |

| | 0.50 | 5 ⁵ | 92-137 | 112 | 16.7 | 14.8 |
|--|-------------|----------------|---------|-----|------|------|
| Confirmation ion | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | 0.050 (LOQ) | 5 | 99-135 | 117 | 16.8 | 14.4 |
| | 0.50 | 5 ⁵ | 98-156 | 118 | 23.3 | 19.8 |
| IN-MS775 | 0.050 (LOQ) | 5 | 89-108 | 102 | 7.6 | 7.5 |
| | 0.50 | 5 | 96-117 | 106 | 8.0 | 7.6 |
| IN-JT333 | 0.050 (LOQ) | 5 | 80-125 | 96 | 17.5 | 18.3 |
| | 0.50 | 5 | 87-120 | 102 | 12.0 | 11.8 |
| IN-MP819 | 0.050 (LOQ) | 5 | 71-92 | 80 | 8.0 | 10.0 |
| | 0.50 | 5 | 72-113 | 92 | 15.4 | 16.7 |
| IN-JU873 | 0.050 (LOQ) | 5 | 106-117 | 110 | 4.4 | 4.0 |
| | 0.50 | 5 | 97-136 | 113 | 14.8 | 13.1 |
| IN-KG433 | 0.050 (LOQ) | 5 | 98-125 | 108 | 10.8 | 9.9 |
| | 0.50 | 5 | 97-130 | 112 | 13.4 | 11.9 |

Data (recovery results) were obtained from Table 1, pp. 28-31 of MRID 49599604; Tables 1-2, pp. 15-22 of MRID 49599605. All results were calculated by the study authors, except where noted (see DER Attachment 2; see Footnotes #3 and 5). Reported sample recoveries in the study report were corrected for any residues found in the matrix blanks; however, no residues were detected in the controls (pp. 20-21 of MRID 49599604; Table 1, pp. 28-31 of MRID 49599604; Tables 1-2, pp. 15-22 of MRID 49599605).

- Water matrices were not characterized (p. 15 of MRID 49599604). Surface waters were obtained from Lums Pond in Bear, Delaware and Brandywine River in Wilmington, Delaware. The ground water was obtained from Kemblesville Well in Kemblesville, Pennsylvania. The drinking water was bottled water purchase from a local grocery store (ACME; Pine Valley Spring, New Ringgold, Pennsylvania). The same water matrices were used for both ECMs.
- In the ECM with Rev. 1, two or three parent-daughter ion transitions were monitored for each analyte: m/z 528.0 → 292.9, m/z 528.0 → 217.8 and m/z 528.0 → 202.9 for DPX-MP062; m/z 411.9 → 208.8 and m/z 411.9 → 190.8 for IN-MS775; m/z 470.0 → 149.8, **m/z 470.0 → 266.9** and m/z 470.0 → 206.9 for IN-JT333; m/z 458.0 → 149.0, **m/z 458.0 → 204.8** and m/z 458.0 → 254.8 for IN-JU873; m/z 516.0 → 220.9 and **m/z 516.0 → 280.8** for IN-KG433; and m/z 238.5 → 194.2 and **m/z 238.5 → 131.2** for IN-MP819 (all transitions were ±0.5 amu; quantitation ion transitions were **bolded**; pp. 19-21 of MRID 49599604). For quantification in the ECM with Rev. 1, DPX-MP062 and IN-MS775 were quantified using total ion count (TIC;). All other analytes were quantified using the **bolded** ion transitions listed above. All analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS.
- Standard deviations were reviewer-calculated for DPX-MP062 and IN-MS775, since only means and RSDs were provided in the study report for ECM MRID 49599604 (see DER Attachment 2).
- Even though standard deviations were not reported in ECM MRID 49599604, the individual recovery results for the quantification ion of IN-JT333, IN-MP819, IN-JU873 and IN-KG433 were the exact same as those reported in ECM MRID 49599605 (quantitative ion; Table 1, pp. 28-31 of MRID 49599604; Table 1, pp. 15-18 of MRID 49599605). So, the standard deviations which were calculated and reported in ECM MRID 49599605 were reported for ECM MRID 49599604. The individual recovery results for DPX-MP062 and IN-MS775 did not match between ECMs since quantification of these analytes was performed using TIC in MRID 49599604.
- The study authors calculated the statistics for the LOQ or 10×LOQ recovery results with the exclusion of one outlier per sample set. Reported statistics were reviewer-calculated based on all five recovery values (see DER Attachment 2).
- Monitored ion transitions in the Supplemental ECM were as follows: **m/z 528.0 → 217.8** and m/z 528.0 → 202.9 for DPX-MP062; **m/z 411.9 → 208.8** and m/z 411.9 → 190.8 for IN-MS775; m/z 470.0 → 149.8 and **m/z 470.0 → 266.9** for IN-JT333; m/z 458.0 → 149.0 and **m/z 458.0 → 204.8** for IN-JU873; m/z 516.0 → 220.9 and **m/z 516.0 → 280.8** for IN-KG433; and m/z 238.5 → 194.2 and **m/z 238.5 → 131.2** for IN-MP819 (all transitions were ±0.5 amu; quantitation ion transitions were **bolded**, the confirmation ion transitions were in plain text; pp. 10-12 of MRID 49599605). All analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS.

Table 3. Independent Validation Method Recoveries for DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433, in Water^{1,2}

| Analyte | Fortification Level (µg/L) | Number of Tests | Recovery Range (%) | Mean Recovery (%) | Standard Deviation (%) | Relative Standard Deviation (%) |
|--|----------------------------|-----------------|--------------------|-------------------|------------------------|---------------------------------|
| ILV - MRID 49599606 (Quantitation Ion Only) | | | | | | |
| Drinking Water (Tap Water) | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] ³ | 0.050 (LOQ) | 5 | 100-105 | 103 | 2.0 | 2 |
| | 0.50 | 5 | 105-108 | 107 | 1.4 | 1 |
| IN-MS775 ⁴ | 0.050 (LOQ) | 5 | 103-115 | 110 | 5.3 | 5 |
| | 0.50 | 5 | 77-82 | 79 | 2.6 | 3 |
| IN-JT333 ^{3,5} | 0.050 (LOQ) | 5 | 92-107 | 102 | 6.0 | 6 |
| | 0.50 | 5 | 99-102 | 100 | 1.1 | 1 |
| IN-MP819 ^{3,5} | 0.050 (LOQ) | 5 | 92-107 | 102 | 6.0 | 6 |
| | 0.50 | 5 | 99-102 | 100 | 1.1 | 1 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 69-72 | 71 | 1.1 | 1 |
| | 0.50 | 5 | 78-85 | 82 | 2.6 | 3 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 91-104 | 98 | 4.8 | 5 |
| | 0.50 | 5 | 88-98 | 91 | 4.0 | 5 |
| Ground Water | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] ³ | 0.050 (LOQ) | 5 | 100-107 | 103 | 2.5 | 2 |
| | 0.50 | 5 | 98-105 | 101 | 3.0 | 3 |
| IN-MS775 ⁴ | 0.050 (LOQ) | 5 | 99-109 | 102 | 4.0 | 4 |
| | 0.50 | 5 | 76-90 | 82 | 5.6 | 7 |
| IN-JT333 ³ | 0.050 (LOQ) | 5 | 103-117 | 110 | 5.2 | 5 |
| | 0.50 | 5 | 101-107 | 104 | 2.8 | 3 |
| IN-MP819 ³ | 0.050 (LOQ) | 5 | 86-114 | 104 | 10.9 | 11 |
| | 0.50 | 5 | 85-98 | 91 | 5.0 | 5 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 84-91 | 87 | 2.9 | 4 |
| | 0.50 | 5 | 83-93 | 88 | 3.7 | 4 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 99-112 | 105 | 4.7 | 4 |
| | 0.50 | 5 | 81-84 | 82 | 1.4 | 2 |
| Surface (River) Water | | | | | | |
| DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] ³ | 0.050 (LOQ) | 5 | 100-111 | 105 | 4.0 | 4 |
| | 0.50 | 5 | 104-107 | 106 | 1.3 | 1 |
| IN-MS775 ⁴ | 0.050 (LOQ) | 5 ⁶ | 45-115 | 96 | 29.6 | 30.7 |
| | 0.50 | 5 | 80-85 | 83 | 2.2 | 3 |
| IN-JT333 ³ | 0.050 (LOQ) | 5 | 95-117 | 106 | 8.9 | 8 |
| | 0.50 | 5 | 105-107 | 105 | 0.9 | 1 |

| Analyte | Fortification Level (µg/L) | Number of Tests | Recovery Range (%) | Mean Recovery (%) | Standard Deviation (%) | Relative Standard Deviation (%) |
|-----------------------|----------------------------|-----------------|--------------------|-------------------|------------------------|---------------------------------|
| IN-MP819 ³ | 0.050 (LOQ) | 5 | 79-115 | 100 | 13.3 | 13 |
| | 0.50 | 5 | 91-98 | 93 | 2.9 | 3 |
| IN-JU873 ⁴ | 0.050 (LOQ) | 5 | 72-80 | 76 | 2.9 | 4 |
| | 0.50 | 5 | 79-86 | 83 | 3.4 | 4 |
| IN-KG433 ⁴ | 0.050 (LOQ) | 5 | 97-111 | 104 | 5.5 | 6 |
| | 0.50 | 5 | 75-85 | 79 | 3.7 | 5 |

Data (uncorrected recovery results; p. 11) were obtained from pp. 20-21; Annex V5033/02 B07, pp. 64-69 of MRID 49599606. Standard deviations were reviewer-calculated for all analytes, since only means and RSDs were provided in the study report (see DER Attachment 2). Reported fortification levels were nominal values, actual values were *ca.* 0.051-0.053 and 0.51-0.53 µg/L.

1 The water matrices were drinking water (tap water, Zeist), ground water (Netherlands, sample 699/04/1593) and surface water (local river/channel, Netherlands, sample 0699/05/0024; p. 12). The surface water was characterized by Alcontrol, The Netherlands (pH 7.9, total organic carbon 36 mg/L; pp. 9, 12). The ground and drinking water were not characterized.

2 Only one ion transition was monitored for each analyte: m/z 528 → 293 for DPX-MP062; m/z 412 → 209 for IN-MS775; m/z 470 → 267 for IN-JT333; m/z 458 → 149 for IN-JU873; and m/z 516 → 281 for IN-KG433 (p. 16).

3 LC-APCI-MS/MS analyses; first trial.

4 LC-ESI-MS/MS analyses; IN-JU873, first trial; IN-KG433, second trial; IN-MS775, third trial.

5 The reviewer noted that the recovery results for IN-JT333 and IN-MP819 were exactly the same for the LOQ and 10×LOQ sample sets in drinking water.

6 The study authors calculated the statistics for the LOQ recovery results with the exclusion of one outlier per sample set. Reported statistics were reviewer-calculated based on all five recovery values (see DER Attachment 2).

III. Method Characteristics

In both the ECMs and ILV, the LOQ for all analytes was reported as 0.05 µg/L (pp. 8, 23-24; Figure 5, pp. 55-56 of MRID 49599604; pp. 8, 13 of MRID 49599605; pp. 10, 23 of MRID 49599606). In the ECMs and ILV, the LOQ was defined as the lowest fortification level which obtained average recoveries of 70-120% and a RSD <20%. The LOQ also corresponded to the fortification in which analyte peak heights were consistently *ca.* 10-20 times the signal in the control at the retention time of the analyte for the lowest responding analyte (see Figure 5, pp. 55-56 of MRID 49599604 for examples). The LOD for all analytes was estimated as *ca.* 0.02 µg/L in the ECMs and ILV. In the ECMs and ILV, the LOD was estimated for each analyte based on signal-to-noise. The LOD was defined as the concentration of the least responsive analyte at which analyte peaks were approximately three times the chromatographic baseline noise observed near the retention time or approximately 1/3 the concentration of the LOQ. In the ECM with Rev. 1, the least responsive analyte was reported as IN-MP062; in the ILV, the least responsive analyte was reported as IN-MP819 (not reported in the Supplemental ECM) The study authors of the ECMs noted that variation in the LOD was observed, and instrument response may fluctuate between routine instrument maintenance. The ILV study author also noted that no differences were observed for the three types of waters.

Table 4. Method Characteristics

| | | DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | IN-MS775 | IN-JT333 | IN-MP819 | IN-JU873 | IN-KG433 | |
|---|--------------------------------------|--|--|--|--|--|--|--|
| Limit of Quantitation (LOQ) | | 0.05 µg/L | | | | | | |
| Limit of Detection (LOD) | | ca. 0.02 µg/L | | | | | | |
| Linearity (calibration curve r^2 and concentration range) | ECM 1 ¹ | $r^2 = 0.9995$ (Q) | $r^2 = 0.9971$ (Q) | $r^2 = 0.9984$ (Q) | $r^2 = 0.9967$ (Q) | $r^2 = 0.9991$ (Q) | $r^2 = 0.9988$ (Q) | |
| | ECM 2 ¹ | $r^2 = 0.9982$ (Q) $r^2 = 0.9967$ (C) | $r^2 = 0.9972$ (Q) $r^2 = 0.9974$ (C) | $r^2 = 0.9990$ (Q) $r^2 = 0.9975$ (C) | $r^2 = 0.9987$ (Q) $r^2 = 0.9998$ (C) | $r^2 = 0.9966$ (Q) $r^2 = 0.9966$ (C) | $r^2 = 0.9976$ (Q) $r^2 = 0.9986$ (C) | |
| | 0.50-15.0 ng/mL (ECM 1 and ECM 2) | | | | | | | |
| | ILV ² | $r^2 = 0.9999-1.0000$ (Q) | $r^2 = 0.9926-0.9962$ (Q) | $r^2 = 0.9998-1.0000$ (Q) | $r^2 = 0.9983-1.0000$ (Q) | $r^2 = 0.9986-0.9994$ (Q) | $r^2 = 0.9994-0.9996$ (Q) | |
| | | ca. 0.6-16.0 ng/mL | | | | | | |
| Repeatable | ECM ^{3,4} | ECM with Rev. 1 - MRID 49599604 (Total Ion Count or Quantitation Ion Only) | | | | | | |
| | | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river) and ground (well) water matrices. No, at 10×LOQ (n=5) drinking (bottled) water matrix (20.1% RSD); Yes at LOQ. | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river), ground (well) and drinking (bottled) water matrices. | | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), ground (well) and drinking (bottled) water matrices. No at the LOQ (n=5) in surface (river) water matrix (21.1% RSD); Yes at 10×LOQ. | | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river), ground (well) and drinking (bottled) water matrices. | |
| | | Supplemental ECM - MRID 49599605 (Quantitation and Confirmation Ions) | | | | | | |
| | | Quantitation Ion | | | | | | |
| | | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river) and ground (well) water matrices. No, at 10×LOQ | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), ground (well) and drinking (bottled) water matrices. No at the LOQ | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river), ground (well) and drinking (bottled) water matrices. | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), ground (well) and drinking (bottled) water matrices. No at the LOQ | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river), ground (well) and drinking (bottled) water matrices. | | |

| | | DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | IN-MS775 | IN-JT333 | IN-MP819 | IN-JU873 | IN-KG433 | |
|--|--|--|---|---|---|---|----------|--|
| | | (n=5) drinking (bottled) water matrix (21.0% RSD); Yes at LOQ | (n=5) in surface (river) water matrix (21.4% RSD); Yes at 10×LOQ. | | (n=5) in surface (river) water matrix (21.1% RSD); Yes at 10×LOQ. | | | |
| | | Confirmation Ion | | | | | | |
| | Yes at the LOQ and 10×LOQ (n=5) in surface (pond), surface (river), ground (well) and drinking (bottled) water matrices. | | | | | | | |
| | ILV ^{4,5} | MRID 49599606 (Quantitation Ion Only) | | | | | | |
| | Yes at the LOQ and 10×LOQ (n=5) in surface (river), ground (well) and drinking (tap) water matrices. | Yes at the LOQ and 10×LOQ (n=5) in ground (well) and drinking (tap) water matrices. No at the LOQ (n=5) in surface (river) water matrix (30.7% RSD); Yes at 10×LOQ. | Yes at the LOQ and 10×LOQ (n=5) in surface (river), ground (well) and drinking (tap) water matrices | | | | | |
| Reproducible | Yes at the LOQ and 10×LOQ in all water matrices, except IN-MS775 in surface (river) water matrix. | | | | | | | |
| Specific | ECM | ECM with Rev. 1 - MRID 49599604 (Total Ion Count or Quantitation Ion Only) | | | | | | |
| | | Confirmation of analyte identification was performed by the calculation of the ion ratios. | | | | | | |
| | | Yes, negligible residue in control of river and bottled water matrices; no matrix interference in other matrices. | Yes, no matrix interferences were observed. | Baseline noisy in all chromatograms; peak attenuation was not smooth. | Yes, negligible residue in control of river and bottled water matrices; no matrix interference in other matrices. | Yes, no matrix interferences were observed. | | |
| | | Supplemental ECM - MRID 49599605 (Quantitation and Confirmation Ions) | | | | | | |
| | | Quantitation Ion | | | | | | |
| Not shown, already submitted in MRID 49599604. | | | | | | | | |
| Confirmation Ion | | | | | | | | |

| | | DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] | IN-MS775 | IN-JT333 | IN-MP819 | IN-JU873 | IN-KG433 |
|--|------------------|---|--|--|--|---|--|
| | | Yes, negligible residue in control of river, bottled and ground water matrices; no matrix interference in other matrices. | Yes, no matrix interferences were observed. | | Baseline noisy in all chromatograms; peak integration was not uniform between chromatograms. | Yes, negligible residue in control of river water matrix; no matrix interference in other matrices. | Yes, no matrix interferences were observed. |
| | ILV ⁶ | MRID 49599606 (Quantitation Ion Only) | | | | | |
| | | No confirmation method was performed. ⁷ Analyte peak tailing was observed in most of the chromatograms. | | | | | |
| | | Yes, no matrix interferences were quantified. | Matrix interferences were quantified at 0.6-6% of LOQ. | Matrix interferences were quantified at 6% of LOQ. | Matrix interferences were quantified at 6-12% of LOQ. | Yes, no matrix interferences were quantified. | Matrix interferences were quantified at 1-8% of LOQ. |

Data were obtained from pp. 8, 23-24; Table 1, pp. 28-31; Figures 4-5, pp. 43-56; Appendix 2, pp. 60-64 of MRID 49599604; pp. 8, 13; Tables 1-2, pp. 15-22; Figure 1, pp. 23-25; Figure 3, pp. 28-39; Appendix 4, pp. 40-42 of MRID 49599605; pp. 10, 21-23; Annex V5033/02 B03-B04, pp. 33-57; Annex V5033/02 B07, pp. 64-69 of MRID 49599606; DER Attachment 2. ECM 1 = MRID 49599604; ECM 2 = MRID 49599605. Q = quantitative ion; C = confirmatory ion.

- For MRID 49599604, calibration data was provided for the Lums Pond and Brandywine River matrices (Appendix 2, pp. 60-64 of MRID 49599604). The reviewer calculated the standard curves for the Lums Pond matrix using the calibration data (quantitation ion only; see DER Attachment 2). The calibration curves for Brandywine River water matrix which were presented in MRID 49599605 applied to both ECMs (based on data collection dates; Appendix 2, pp. 60-62 of MRID 49599604; Figure 1, pp. 23-25; Appendix 1, pp. 40-42 of MRID 49599605).
- In the ILV, reviewer calculated the standard curves for the drinking, surface and ground water matrices using the calibration data (quantitation ion only; Annex V5033/02 B07, pp. 64-69 of MRID 49599606; see DER Attachment 2).
- In the ECMs, all analytes were analyzed using LC ESI-LC/MS/MS, except IN-MP819 which was analyzed using LC APCI-LC/MS/MS. Water matrices were not characterized (p. 15 of MRID 49599604). Surface waters were obtained from Lums Pond in Bear, Delaware and Brandywine River in Wilmington, Delaware. The ground water was obtained from Kemblesville Well in Kemblesville, Pennsylvania. The drinking water was bottled water purchase from a local grocery store (ACME; Pine Valley Spring, New Ringgold, Pennsylvania). The same water matrices were used for both ECMs.
- The study authors of the ECMs and ILV calculated the statistics for several of the recovery results with the exclusion of one outlier per sample set. The reviewer recalculated these recovery statistics based on all five recovery values (see DER Attachment 2). Many of the recovery statistics which were not within acceptable limits were these reviewer-calculated values.
- In the ILV, DPX-MP062, IN-JT333 and IN-MP819 were analyzed using LC APCI-LC/MS/MS, while IN-MS775, IN-JU873 and IN-KG433 were analyzed using LC ESI-LC/MS/MS. The water matrices were drinking water (tap water, Zeist), ground water (Netherlands, sample 699/04/1593) and surface water (local river/channel, Netherlands, sample 0699/05/0024; p. 12 of MRID 49599606). The surface water was characterized by Alcontrol, The Netherlands (pH 7.9, total organic carbon 36 mg/L; pp. 9, 12). The ground and drinking water were not characterized.
- Based on tabular data in Annex V5033/02 B04, p. 57 of MRID 49599606 and confirmed with chromatograms presented in Annex V5033/02 B03-B04, pp. 33-56.
- A confirmatory method is not usually required when LC/MS and GC/MS is the primary method. Linearity is satisfactory when $r^2 \geq 0.995$.

IV. Method Deficiencies and Reviewer's Comments

1. The ILV was performed to validate ECM 1 (MRID 49599604; issued March 3, 2003), since ECM 2 (MRID 49599605; issued September 15, 2014) was not provided to the ILV (issued May 20, 2003) due to study timeframes (p. 1 of MRID 49599604; p. 1 of MRID 49599605; pp. 1, 26 of MRID 49599606). ECM 2 was not listed in the References section of the ILV. DuPont-9605, Supplement No. 1 (ECM 2) supported ECM 1 with quantification and confirmation ion transition data for each analyte with no other modification to the method. No ILV was submitted to validate ECM 2.
2. The ILV study author suggested minor modifications to ECM 1 to increase the applicability and success of the method; an updated ECM to include these minor modifications should be submitted since they were necessary for the successful validation of the method (pp. 11, 16, 23, 25 of MRID 49599606). Modifications included 1) measuring all analytes but IN-MS775 and IN-MP819 by APCI and ESI analyses so that the optimum analytical conditions can be selected by the performing laboratory; 2) the omission of the hexane rinse step of the SPE column, since an earlier study found that IN-JT333 partially eluted during this step; 3) for IN-KG433, the use of freshly prepared solutions and the addition of acetic acid to the acetonitrile solvent to improve stability; 4) for IN-MS775, the addition of acetic acid to the acetonitrile component of the LC gradient and the injection of calibration standards in between sample sets to improve the accuracy of the measurements; and 5) the addition of acetic acid to the final extracts for increased stability. Insignificant modifications to the ECM were also listed in the ILV, including substitutions of instrumentation and that DPX-MP062 and IN-MS775 were quantified with one ion transition, not TIC (p. 20 of MRID 49599604; p. 17 of MRID 49599606).
3. The estimations of the LOQ and LOD in the ECM were not based on scientifically acceptable procedures as defined in 40 CFR Part 136. In the ECMs and ILV, the LOQ was defined as the lowest fortification level which obtained average recoveries of 70-120% and a RSD <20% (pp. 8, 23-24; Figure 5, pp. 55-56 of MRID 49599604; pp. 8, 13 of MRID 49599605; pp. 10, 23 of MRID 49599606). The LOQ also corresponded to the fortification in which analyte peak heights were consistently *ca.* 10-20 times the signal in the control at the retention time of the analyte for the lowest responding analyte. In the ECMs and ILV, the LOD was estimated for each analyte based on signal-to-noise. The LOD was defined as the concentration of the least responsive analyte at which analyte peaks were approximately three times the chromatographic baseline noise observed near the retention time or approximately 1/3 the concentration of the LOQ. In the ECM with Rev. 1, the least responsive analyte was reported as IN-MP062; in the ILV, the least responsive analyte was reported as IN-MP819 (not reported in the Supplemental ECM) The study authors of the ECMs noted that variation in the LOD was observed, and instrument response may fluctuate between routine instrument maintenance. The LOQ and LOD were not adequately supported by calculations.

Detection limits should not be based on the arbitrarily selected lowest concentration in the spiked samples. Additionally, the lowest toxicological levels of concern in water were not reported. An LOQ above toxicological level of concern results in an unacceptable method classification.

4. Several RSDs were >20% in the studies. In the ECM 1, RSDs were not within guidelines for the LOQ recovery results of IN-MP819 in surface (river) water (21.1% RSD) and the 10×LOQ recovery results of DPX-MP062 in drinking (bottled) water (20.1% RSD; Table 1, pp. 28-31; DER Attachment 2). In the ECM 2, RSDs were not within guidelines for the LOQ quantitation ion recovery results of IN-MS775 and IN-MP819 in surface (river) water (21.4% and 21.1% RSD, respectively) and the 10×LOQ quantitation ion recovery results of DPX-MP062 in drinking (bottled) water (21.0% RSD; Tables 1-2, pp. 15-22; DER Attachment 2). In the ILV, RSDs were not within guidelines for the LOQ recovery results of IN-MS775 in surface (river) water (30.7% RSD; uncorrected recovery results; pp. 20-21; Annex V5033/02 B07, pp. 64-69; DER Attachment 2). OCSPP guidelines recommend that RSDs are ≤20% for each analyte/fortification/matrix.
5. Most of the water matrices were not characterized in the ECMs (all water matrices) and ILV (ground and drinking water; p. 15 of MRID 49599604; pp. 9, 12 of MRID 49599606). The sources of the waters were reported. The water matrices were the same as those of MRID 49599604; no new information was provided (based on data matching and source identification).
6. In the ILV, linearity was not satisfactory for two of the linear regressions of IN-MS775 ($r^2 = 0.9926$ and 0.9943 ; see above and DER Attachment 2). Linearity is satisfactory when $r^2 \geq 0.995$.

The reviewer calculated all linear regressions for the ILV from the provided individual calibration data since no linear regression curves or values were reported in the study (Annex V5033/02 B07, pp. 64-69 of MRID 49599606). For the ECM 1, no linear regression curves or values were reported in the study; however, individual calibration data was provided for the Lums Pond and Brandywine River matrices (Appendix 2, pp. 60-64 of MRID 49599604). For ECM 2, linear regression curves and values were reported in the study for the Brandywine River matrix, but for no other matrix (Figure 1, pp. 23-25; Appendix 1, pp. 40-42 of MRID 49599605). The reviewer determined that the calibration curves for Brandywine River water matrix which were presented in MRID 49599605 applied to both ECMs, based on data collection dates being the same. To supply additional calibration information, the reviewer calculated the standard curves for the Lums Pond matrix using the calibration data of ECM 1 (quantitation ion only; see DER Attachment 2).

7. ILV representative chromatograms showed peak tailing for most of the analyte peaks (Annex V5033/02 B03, pp. 33-56 of MRID 49599606). Matrix interferences were calculated at 0-12% of the LOQ for all analytes (Annex V5033/02 B04, p. 57). Interferences were <50% of the LOD. Reagent blanks were not included in the ILV.

ECM representative chromatograms from both ECM 1 and ECM 2 showed no or negligible matrix interferences in the control samples for the analytes (Figure 4, pp. 43-55 of MRID 49599604; Figure 3, pp. 28-39 of MRID 49599605). The reviewer noted that chromatograms of IN-MP819 had a noisy baseline which caused minor interference with the peak attenuation and/or difference in the peak integration between chromatograms. Reagent blanks were not included in the ECMs.

8. The ILV study author discussed the results for each compound, including failed trials and best results (pp. 21-22 of MRID 49599606). For DPX-MP062 and IN-JT333, suppression effects were observed in ESI analysis and caused low recoveries. Results from the APCI were considered more accurate. For IN-MP819, only APCI analysis results were used due to poor ESI response. For IN-JU873, ESI results were chosen because slight enhancement was observed with APCI results. For IN-KG433, the ESI analysis of the second validation yielded acceptable results after modifications (discussed above), so APCI analysis was not attempted. For IN-MS775, the analyte can only be measured by ESI, so APCI could not be attempted. The third validation with ESI analysis yielded acceptable results after modifications (discussed above).
9. The reviewer noted one significant typographical error in the ECM MRID 49599604: IN-JU873 was incorreced listed as IN-JU874 (Table 1, pp. 28-31).
10. The ILV study author noted that, with the addition of acetic acid, the final extracts of samples fortified with DPX-MP062, IN-JT333, IN-MP819 and IN-JU873 were shown to be stable for at least 7 days (p. 23 of MRID 49599606).
11. The results for several analyses which were presented in the study report were reviewer-calculated using all reported values (see Tables 2-3 above for details). OCSPP guidelines recommend a minimum of five spiked replicates to be analyzed at each concentration (*i.e.*, minimally, the LOQ and 10× LOQ) for each analyte.
12. It was reported for the ILV that a sample sets consisting of 12 samples could be prepared in an 8-hour workday, where the evaporation of the acetonitrile extract was the most time consuming step (p. 24 of MRID 49599606). One of the two LC/MS/MS analyses was performed unattended overnight, and the second LC/MS/MS analysis was performed the next day.
13. Communications between the ILV study author and ECM sponsor were limited to approval of each validation set, discussion of the failure of the trials, and the suggestions of the modifications of the ECM method to improve results (acetic acid addition, etc.; pp. 23-24 of MRID 49599606).

V. References

- U.S. Environmental Protection Agency. 2012. Ecological Effects Test Guidelines, OCSPP 850.6100, Environmental Chemistry Methods and Associated Independent Laboratory Validation. Office of Chemical Safety and Pollution Prevention, Washington, DC. EPA 712-C-001.
- 40 CFR Part 136. Appendix B. Definition and Procedure for the Determination of the Method Detection Limit-Revision 1.11, pp. 317-319.

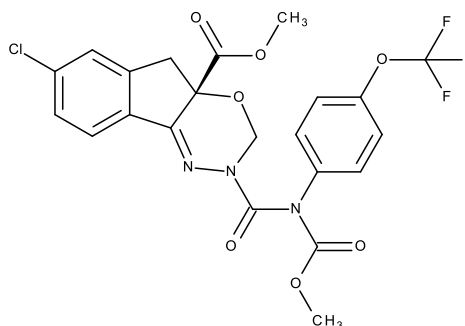
Attachment 1: Chemical Names and Structures**DPX-MP062****[75% DPX-KN128 (Indoxacarb) and 25% IN-KN127 (optical isomer of indoxacarb)]****Indoxacarb (DPX-KN128)**

IUPAC Name: Methyl (S)-N-[7-chloro-2,3,4a,5-tetrahydro-4a-(methoxycarbonyl)indeno[1,2-e][1,3,4]oxadiazin-2-ylcarbonyl]-4'-(trifluoromethoxy)carbanilate.

CAS Name: Methyl (4aS)-7-chloro-2,5-dihydro-2-[[[(methoxycarbonyl)[4-(trifluoromethoxy)phenyl]amino]carbonyl]indeno[1,2-e][1,3,4]oxadiazine-4a(3H)-carboxylate.
(S)-methyl 7-chloro-2,5-dihydro-2-[[[(methoxycarbonyl)[4-(trifluoromethoxy)phenyl]amino]carbonyl]=indeno[1,2-e][1,3,4]oxadiazine-4a(3H)-carboxylate.

CAS Number: 173584-44-6

SMILES String: COC(=O)[C@]12Cc3cc(ccc3C1=NN(CO2)C(=O)N(c4ccc(cc4)OC(F)(F)F)C(=O)OC)Cl

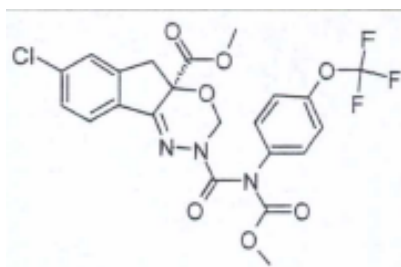
**IN-KN127**

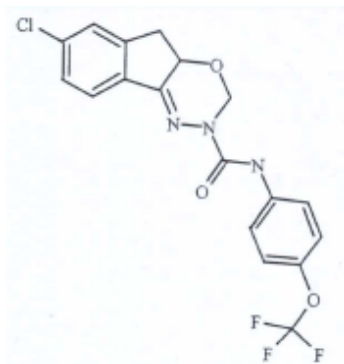
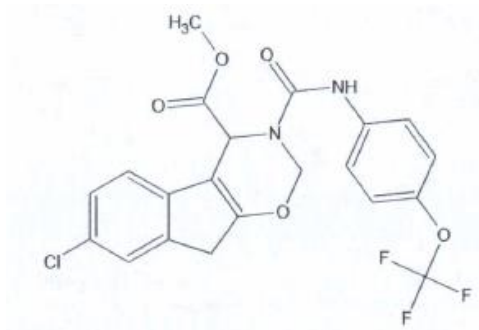
IUPAC Name: Not reported

CAS Name: (R)-methyl 7-chloro-2,5-dihydro-2-[[[(methoxycarbonyl)[4-(trifluoromethoxy)phenyl]amino]carbonyl]=indeno[1,2-e][1,3,4]oxadiazine-4a(3H)-carboxylate.

CAS Number: Not reported

SMILES String: Not found



IN-MS775**IUPAC Name:** Not reported**CAS Name:** Not reported**CAS Number:** Not reported**SMILES String:** Not found**IN-MP819****IUPAC Name:** Not reported**CAS Name:** Methyl ester 7-chloro-3,5-dihydro-2-[[[4-(trifluoromethoxy)-phenyl]amino]carbonyl]-indeno[1.2-e][1,3,4]oxadiazine-1(2H)-carboxylic acid.**CAS Number:** Not reported**SMILES String:** Not found

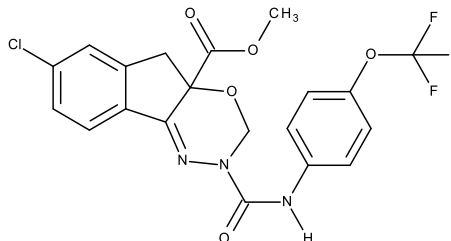
IN-JT333

IUPAC Name: Methyl 7-chloro-2-[[4-(trifluoromethoxy)phenyl]carbamoyl]-3,5-dihydroindeno[1,2-e][1,3,4]oxadiazine-4a-carboxylate.

CAS Name: Methyl 7-chloro-2,5-dihydro-2-[[[4-(trifluoromethoxy)phenyl]amino]carbonyl]indeno[1,2-e][1,3,4]oxadiazine-4a(3H)-carboxylate.

CAS Number: 144171-39-1

SMILES String: [H]N(c1ccc(cc1)OC(F)(F)F)C(=O)N2COC3(Cc4cc(ccc4C3=N2)Cl)C(=O)OC

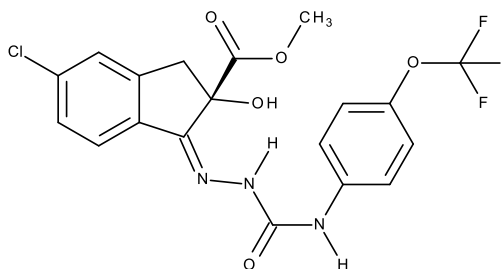
**IN-JU873**

IUPAC Name: 4-Allyl-6-amino-7-fluoro-1,4-benzoxazin-3-one.

CAS Name: Not reported

CAS Number: Not reported

SMILES String: [H]N([H])c1cc2c(cc1F)OCC(=O)N2CC=C



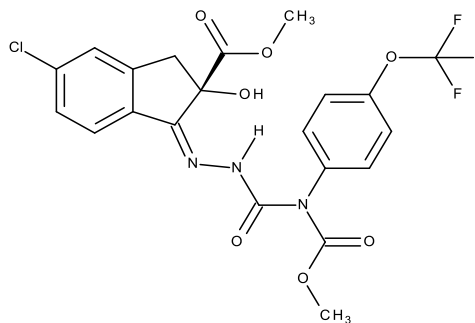
IN-KG433

IUPAC Name: Methyl (1Z,2S)-5-chloro-2-hydroxy-1-[[methoxycarbonyl-[4-(trifluoromethoxy)phenyl]carbamoyl]hydrazono]indane-2-carboxylate.

CAS Name: Not reported

CAS Number: Not reported

SMILES String: [H]N(C(=O)N(c1ccc(cc1)OC(F)(F)F)C(=O)OC)/N=C\2/c3ccc(cc3C[C@]2(C(=O)OC)O)Cl



Test Material: DPX-MP062 (75% Indoxacarb and 25% IN-KN127)

MRID: 49599604

Title: Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (Indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in Ground, Surface, and Drinking Waters Using LC/MS/MS

MRID: 49599605

Title: Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (Indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 in Ground, Surface, and Drinking Waters Using LC/MS/MS

MRID: 49599606

Title: Independent Laboratory Validation of DuPont-9605, Revision 1
“Analytical Method for the Determination of DPX-MP062 [75% DPX-KN128 (indoxacarb) and 25% IN-KN127] and Metabolites IN-MS775, IN-JT333, IN-MP819, IN-JU873, and IN-KG433 In Ground, Surface, and Drinking Waters Using LC/MS/MS”

EPA PC Code: 067710

OCSPP Guideline: 850.6100

For CDM Smith

Primary Reviewer: Lisa Muto

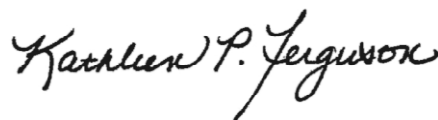
Signature:



Date: 12/1/15

Secondary Reviewer: Kathleen Ferguson

Signature:



Date: 12/1/15

QC/QA Manager: Joan Gaidos

Signature:



Date: 12/1/15