RFP 0000003036 - Equine Drug Testing
Technical Proposal
Attachment F

The Technical Proposal must be divided into the sections as described below. Every point made in each section must be addressed in the order given. The same outline numbers must be used in the response. RFP language should not be repeated within the response. Where appropriate, supporting documentation may be referenced by a page and paragraph number. However, when this is done, the body of the technical proposal must contain a meaningful summary of the referenced material. The referenced document must be included as an appendix to the technical proposal with referenced sections clearly marked. If there are multiple references or multiple documents, these must be listed and organized for ease of use by the State.

Technical Proposal

Instructions: Please supply all requested information in the areas shaded yellow and indicate any attachments that have been included. The state is expecting creative cost saving solutions from all of the Respondents in an effort to distinguish the best partner to select.

From Section 2.4 of RFP 0000003036

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2.4.1 PRELIMINARY REQUIREMENTS

2.4.1.1 Provide documentation confirming that at least one senior staff member is, or shall become, a professional member of the Association of Racing Chemists. That staff member must maintain that status for the duration of the contractual agreement.

☑ **Industrial Laboratories meets the requirement.**

AORC membership

Our drug testing team (6) has active members of the AORC. We assure the IHRC that at least one senior staff member will retain professional membership for the duration of the contractual agreement. The professional AOAC members of our team are:

1. Petra Hartmann
2. Tim Krueger
3. Dr. Karen L'Empereur
4. Aaron Simonson
5. Steve Cantrell
6. Michael Oviatt

The AORC is an international group of racing chemists that work exclusively in the field of pari-mutuel drug testing and collaborate to further the science of testing performance animals. The group was formed in Chicago, Illinois in 1947 and today has active members in more than twenty-six countries across the globe. The objectives of the organization are shown on the AORC website as

The objectives of the AORC as outlined in the constitution are " ...to encourage the advancement of those branches of science applicable to the detection of drugs in biological materials; the promotion of research in those fields; the improvement in the qualifications and usefulness of racing through high standards of technical training, ethics, and performance, through exchange of information among members; and furthering of public education and welfare by cooperation of the members with each other and official agencies. "

Petra Hartmann recently became a **fellow-level member** of the organization. Our **professional** AORC members include **Tim Krueger, Steve Cantrell**, and **Michael Oviatt**. **Dr. L'Empereur and Aaron Simonson** are **affiliate** members.

According to the AORC Constitution and Bylaws, the membership classifications are defined as follows:

Affiliate membership:

Section 3
The membership committee may nominate for affiliate membership only an applicant who is actively engaged as a scientist or technologist in an approved racing laboratory or is otherwise officially commissioned or retained as an expert in racing chemistry by a regulatory body.

Affiliate members shall have the privileges of professional members, except that they may not vote on Association business, make nominations, hold certain positions, or be reinstated as other members.

Professional membership:

Section 1
A. The membership committee may nominate for professional membership only an applicant who is a racing chemist. When assessing applicants for professional membership, the following must be considered: laboratory facilities; experience in the science and practice of racing chemistry; scientific degrees from recognised tertiary institutions which have relevance to and support the science of racing chemistry as judged by the membership and professional standards committee and approved by the executive board; postgraduate qualifications and experience; publications; membership in scientific societies; professional and ethical reputations.

An applicant for professional membership must analyze a set of urine samples containing reasonable amounts of drugs. The applicant must request these samples within three months after the membership application has been accepted. Otherwise, a new membership application must be submitted.

Fellow membership:

Section 2
The membership committee may nominate for advancement to fellowship only an applicant who has been a professional member for at least three years and who has maintained professional standards of competence and conduct.

An applicant must offer evidence of one of these:
Significant contribution to the science of racing chemistry which usually shall be three or more research papers of which the applicant is senior author, provided they are of acceptable standard to the committee
Or
Senior responsibility for three or more years in the practice of racing chemistry.
Or
Exceptional contribution to other objects of the Association.

An applicant must supply the names of three references who are fellows.

Petra Hartmann served as the President of the AORC Americas Section which encompasses members in the US, Canada, and South America for a two-year term which recently concluded in April 2018. Petra currently serves on the national Executive Board of the AORC as a Non-Ex Officio member and participates in two Committees: Reference Standard Best Practices and TCO_2 testing methodologies.

We attend US-based conferences, as well as the bi-annual international meeting, to remain informed about drug findings and new methods in place at racing laboratories across the world.

2.4.1.2 Affirm that race day samples shall be tested in accordance with TOBA guidelines.

☑ **Industrial Laboratories meets the requirement.**

IL is pleased to offer Graded Stakes level testing for **ALL routine samples** and commits to the performance standards outlined in the 2020 testing protocol, as follows:

RCI Class 1 drugs: (20 mandatory drugs)

alfentanil, amphetamine, apomorphine, carfentanil, benzoylecgonine, morphine, dermorphin, etorphine, despropionylfentanyl, hydromorphone, levorphanol, meperidine, normeperidine, mephentermine, methamphetamine, ritalinic acid, oxymorphone, and sufentanil **(plus 30 other Class 1 drugs)**

RCI Class 2 drugs: (22 mandatory drugs)

nortriptyline, buprenorphine, buspirone, caffeine, meprobamate, hydroxycarisoprodol, chlorpromazine, desipramine, dezocine, nordiazepam, oxazepam, temazepam, ephedrine, phenylpropanolamine, fluoxetine, fluphenazine, desipramine, lidocaine, mepivacaine, modafinil, nalbuphine, nalorphine, nortriptyline, propionylpromazine, and tramadol **(plus 52 other Class 2 drugs)**

RCI Class 3 drugs: (43 mandatory drugs)

acepromazine, albuterol, boldenone, bumetanide, butorphanol, clenbuterol, cobalt, derecoxib, detomidine, etodolac, fenoprofen, flufenamic acid, flurbiprofen, formoterol, furosemide, gabapentin, glycopyrrolate, guanabenz, ipratropium, ketorolac, metaproterenol, methyltestosterone, metoprolol, nabumetone, nandrolone, pentazocine, phenylpropanolamine, pirbuterol, piroxicam, procaine, promazine, propranolol, pyrilamine, ractopamine, sildenafil, stanozolol, tenoxicam, terbutaline, testosterone, tetrahydrogestrinone, theophylline, trenbolone, xylazine **(plus 41 other Class 3 drugs)**

RCI Class 4 drugs: (19 mandatory drugs)

betamethasone, dantrolene, dexamethasone, diclofenac, diflunisal, firocoxib, flumethasone, flunixin, ibuprofen, isoflupredone, ketoprofen, meclofenamic acid, methocarbamol, methylprednisolone, naproxen, phenylbutazone, prednisolone, prednisone, triamcinolone acetonide **(plus 28 other Class 4 drugs)**

2.4.1.3 Quantitation of all ARCI approved threshold drugs and any other substances listed in 71 IAC 8, and 71 IAC 8.5.

☑ **Industrial Laboratories meets the requirement.**

Industrial Labs has a long and successful track record of helping racing jurisdictions enforce their medication rules through consistently accurate and reliable instrumental testing techniques which can quantitate ARCI approved threshold drugs and other substances as listed in 71 IAC 8 and 71 IAC 8.5.

Our ability to successfully apply our validated testing methods to those substances identified in the RCI Controlled Therapeutic Substances list is shown below: (Note: findings are from more than one jurisdiction and animal species)

Threshold / Permitted Drugs	# of **F**indings using IL Drug Testing Program in 2019
Diclofenac	**20**
Firocoxib	**2**
Flunixin	**67**
Ketoprofen	**22**
Phenylbutazone	**103**
Betamethasone/Dexamethasone	**87**
Isoflupredone	**7**

Methylprednisolone	**23**
Prednisolone	**1**
Triamcinolone acetonide	**19**
Acepromazine	**4**
Albuterol	**134**
Butorphanol	**1**
Cetirizine	**3**
Cimetidine	**0**
Clenbuterol	**308**
Dantrolene	**4**
Detomidine	**2**
DMSO	**0**
Furosemide	**30**
Glycopyrrolate	**1**
Guaifenesin	**1**
Lidocaine	**33**
Mepivacaine	**8**
Methocarbamol	**26**
Omeprazole	**24**
Procaine	**3**
Ranitidine	**12**
Xylazine	**7**
TCO2	**3**
Altrenogest	**13**

2.4.1.4 Quantitation of 16β – hydroxystanozolol, boldenone, nardrolone, and testosterone in biological samples.

☑ **Industrial Laboratories meets the requirement.**

Industrial Labs has validated methods for all anabolic steroids regulated by official thresholds. These methods are available for blood and urine samples, and we also have separate methods for the detection of anabolic steroid esters in hair. Anabolic steroid findings are routine in our analysis, as you can see from the following 2019 summary. Very frequently the findings for testosterone and nandrolone are related to paperwork errors related to accurate gender identifications (e.g.: ridglings or intact males are reported to us as geldings, leading to the sample being tagged as "suspect")

Boldenone	8
Nandrolone	**9**
Testosterone	**40**
Stanozolol / metabolite	**5**

2.4.1.5 The proposal must provide a comprehensive description of the internal quality assurance/quality control programs. The external, independent quality assurance program, to include proficiency samples and blind sample testing shall be described, and the specific entity to administer the external testing program must be identified in the Proposal and approved by the IHRC's representative.

☑ **Industrial Laboratories meets the requirement.**

Please see the full description of our quality programs in Section 2.4.9. of the proposal.

2.4.1.6 Key laboratory personnel should be accessible outside of normal business hours including weekends, holidays, and evenings which correspond with the IHRC's race schedule for the year.

☑ **Industrial Laboratories meets the requirement.**

Key Contacts

Petra Hartmann (primary)	720.214.2020	phartmann@industriallabs.net
Tim Krueger	720.214.2032	tkrueger@industriallabs.net
Andrea Jones	720.214.2033	ajones@industriallabs.net

Upon contract award, we will provide you with contact information for key personnel for use during non-laboratory hours.

2.4.1.7 Provide a description of testing capabilities for equine biological samples, specifically blood, urine, and hair.

☑ **Industrial Laboratories meets the requirement.**

Full information about our capabilities and processes is provided in Sections 2.4.8 of this proposal. To summarize these capabilities:

Testing methods used for sample analysis are validated, documented, legally defensible and have a proven track record of successfully detecting a wide spectrum of drugs in animal biological samples. Industrial Labs can offer screening and confirmatory testing using the following instrumental methods:

Liquid Chromatography – Tandem Mass Spectrometry (LC-MS/MS)
Liquid Chromatography – High Resolution/Time of Flight Mass Spectrometry (LC-HR/TOF-MS)
Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) – installation in progress
Head Space / Gas Chromatography – Mass Spectrometry (GC-MS)
Enzyme Linked ImmunoSorbent Assay (ELISA)
Ion Selective Electrode (ISE)

All testing is performed on validated equipment after verifying system suitability daily. Samples are always accompanied by reagent and system blanks, positive and negative control samples, and reference standards - when applicable. Instrument software maintains all information related to samples, analysis time and conditions. Specific gravity testing and pH of urine samples will be completed for every urine sample found to contain a prohibited substance or a substance in excess of the permitted threshold. Data packets are provided upon request.

Industrial Laboratories has a documented history of successful completion of Indiana's equine drug testing requirements. We have all the resources and established systems in place to maintain your existing system with a proven track record of successful, legally defensible drug findings. We continuously strive to add value to our testing programs through research and development of new drug methods. Industrial Labs values the Indiana Horse Racing Commission as a client, and we will always work to provide you with superior customer service and technical capabilities that meet or exceed your expectations.

Summary of Testing to be provided to the IHRC:

	Post-race test: B&U	Post-race test: Blood only	Out of Competition test:	Injuries/ Post mortem	Contraband	Vet's List	Trainer & Vet Submissions
LC-MS Screen (RCI-CTM- & TOBA	X	X	X	X	X	X	X
LC-MS Screen for Clenbuterol / beta-agonists / Hair, urine or blood	X	X	X	X	X	X	X
LC-MS Screen for Penalty Class A Drugs	X	X	X	X	X	X	
Blood Doping Agents (by ELISA)	1	1	X	X	X	1	1
Growth Hormone (by ELISA)	1	1	X	1	X	1	1

LC-MS Screen for Androgenic Anabolic Steroids	X	X	X	X	X	X	X
LC-MS Screen (Targeted Drug Screen)	X	X	X	X	X	X	X
Bisphosphonates by LC-MS	[1]	[1]	[1]	X		[1]	[1]
SARM's by LC-MS	X	X	X	X	X		
Cobalt (ICP-MS)	10%	10%	X		X	[1]	[1]
RMTC Unknown Protocol	N/A	N/A	N/A	N/A	X	N/A	N/A
Full scan screening by HRMS	[1]	[1]	X	X	X	[1]	[1]

[1] = non routine test – additional charges will apply.

2.4.1.8 If applicable, provide a description of testing capabilities for equine biological samples other than blood, urine, or hair (i.e. saliva, semen, etc.).

☑ **Industrial Laboratories meets the requirement.**

The same testing methodologies as described in the previous section apply to other biological samples.

2.4.1.9 Affirm that IHRC or IHRC staff will be afforded the opportunity to inspect the premises whether in-person or virtually through video conferencing software. Affirm understanding that inspection time/date may be random but will occur within normal business hours.

☑ **Industrial Laboratories meets the requirement.**

Industrial Laboratories hereby affirms that IHRC or IHRC staff will have the opportunity to inspect our premises, either in person or through video conferencing software, with prior notice, during normal business hours. The use of video conferencing software is an ideal tool for verification / examination of proprietary information as part of this proposal process as well. We would like to invite the IHRC for a video conferencing review of our records, including standard operating procedures, scope of drug coverage, proficiency test reports, and other relevant documentation.

2.4.1.10 Confirm participation in both internal and external quality control programs as described above as part of bid. Bidders should be participating in these programs prior to submitting a proposal.

☑ **Industrial Laboratories meets the requirement.**

Industrial Laboratories has a rigorous internal quality control program which includes Internal Blind Analyses, daily quality control samples and a passed sample exchange with other labs.

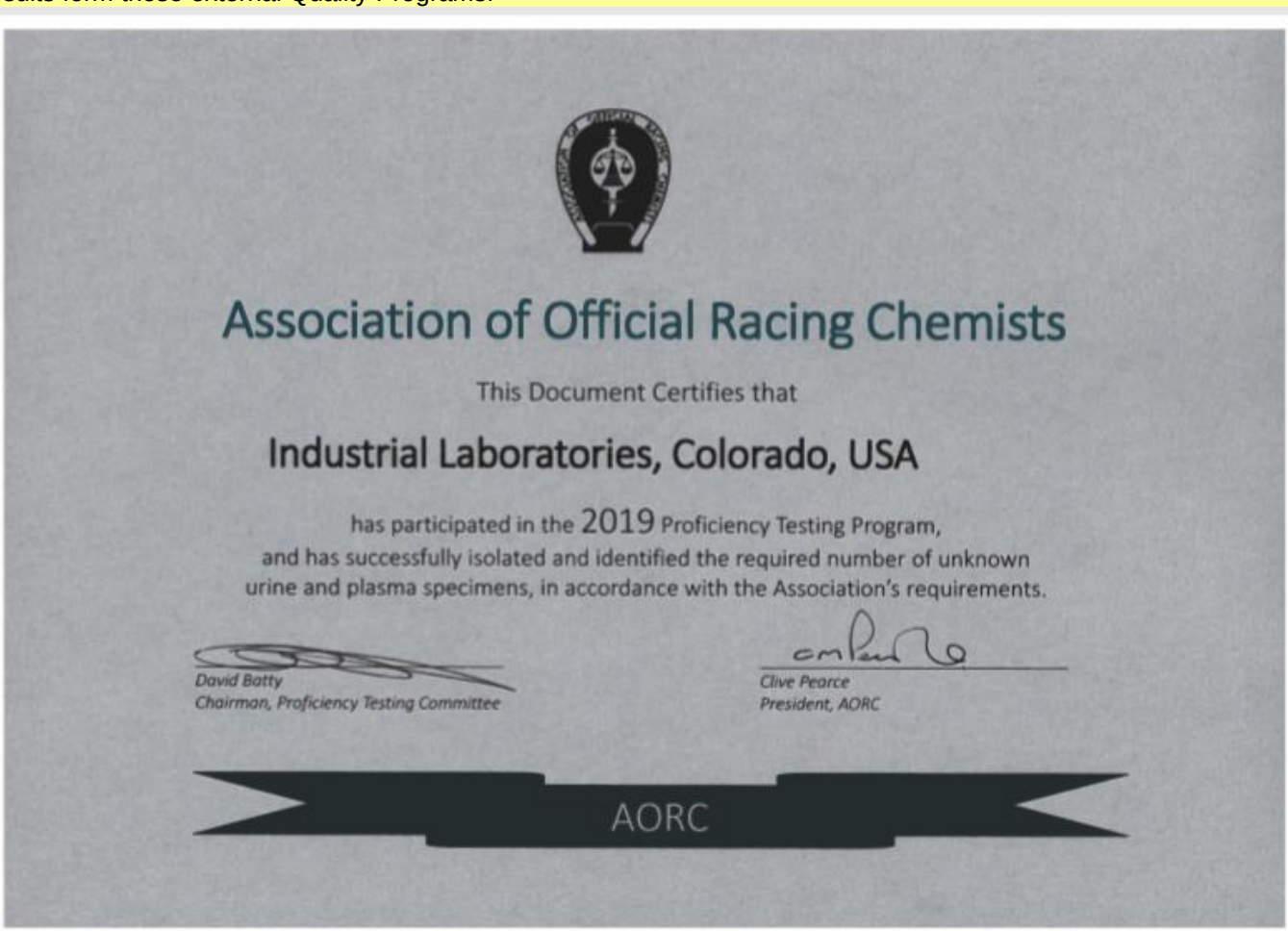
Internal Blind Analyses

Dr. Karen L'Empereur oversees our laboratory's internal blind sample program. Dr. L'Empereur prepares blind samples for both blood and urine and introduces them into the routine operations to determine the efficacy of the test and the performance of staff. Substances are chosen from a list of pre-determined compounds at relevant concentrations. This list is reviewed and updated on a yearly basis. Generally, candidate drugs are chosen based on two factors; the RCI and RMTC Controlled Therapeutic Medication list, and the TOBA "mandatory drugs". Industrial Laboratories can issue an annual report that includes a summary of blind sample analysis, results, any corrective action reports resulting from incorrect blind sample results, as well as reports from external programs, such as negative exchange programs, AORC-EQAP and the RMTC-EQAP.

Passed Sample Exchange

We currently engage in a passed sample exchange with the University of Florida (horse and greyhound samples every 6 months) as well as other jurisdictions on a random basis. This program has existed for approximately the last five years and we are only aware of one occurrence that indicated our screen missed a drug. The compound in question was budesonide, which was not targeted by our test at the time and the drug was detected by Florida in one of our samples. We immediately added the drug to our screen and have not encountered any other reports of false negatives.

Industrial Laboratories also is an active participant in the AORC and RMTC external Quality Assurance Program (QAP) and has consistently passed our quality programs. The Following certificates and reports are the most recent results form these external Quality Programs.



Association of Official Racing Chemists

This Document Certifies that

Industrial Laboratories, Colorado, USA

has participated in the 2019 Proficiency Testing Program,
and has successfully isolated and identified the required number of unknown
urine and plasma specimens, in accordance with the Association's requirements.

David Batty
Chairman, Proficiency Testing Committee

Clive Pearce
President, AORC

AORC

Racing Medication and Testing Individual Report

RM010 - (Round 010)

RM0005 - Industrial Laboratories Company, Inc.

Issue Number: 1

Issued: 10/01/2020

Science
for a safer world

LGC Standards Proficiency Testing
1 Chamberhall Business Park | Chamberhall Green | Bury | United Kingdom | BL9 0AP
-

Sample Details

Samples were despatched: 11 November 2019

Reporting Deadline Date: 16 December 2019

The following samples were despatched in **Round 010**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration	Unit
1	Equine urine	Blank	Blank	
2	Equine urine	6-methoxy-napthyl acetic acid	52.8	ng/ml (µg/L)
3	Equine urine	Benzoylecgonine	35.4	ng/ml (µg/L)
4	Equine urine	Butorphanol	461.1	ng/ml (µg/L)
5	Equine urine	Oxymorphone	4.7	ng/ml (µg/L)
6	Equine plasma	Meclofenamic acid	158.8	ng/ml (µg/L)
7	Equine plasma	Etodolac	40.6	ng/ml (µg/L)
8	Equine plasma	Blank	Blank	
9	Equine plasma	9-OH dantrolene	230.3	pg/ml (ng/L)
10	Equine plasma	Testosterone	45.6	pg/ml (ng/L)
11	Blank Plasma			
12	Blank Urine			

Further information regarding assigned values, performance assessment and technical comments can be found under the individual sample and analyte results.

Laboratories have been allocated anonymous Laboratory ID numbers. These are the Lab ID's that can be seen in the report. A notice detailing which Lab ID is for the individual Laboratories will have been included in the message informing that the report is ready.

Comments

Sample 1: Blank
All laboratories reported "No substance detected".

Sample 2: 6-Methoxy-naphthyl acetic acid
Three laboratories reported the presence of 6-methyl-naphthyl acetic acid. Therefore 6 laboratories have not reported its presence in the result section of PORTAL. However, it is worthy to note the following comments submitted:

Laboratory 35346 stated that DMSO was detected. The 6-methyl-naphthyl acetic acid solution was prepared in DMSO.

Laboratory 89992 stated that the sample appeared to contain a compound that is similar to 6-methoxynapthyl acetic acid (6-MNA), the active metabolite of nabumetone. However, the compound failed retention time criteria during confirmation analysis. Ion ratio criteria were met. Based on the retention difference using two separate reference standards from two separate vendors, we cannot produce a legally defensible data packet for this analysis.

Laboratory 29537 stated that the screening was suspect for 6-MNNA

Sample 3: Benzoylecgonine
All laboratories have reported the presence of Benzoylecgonine.

Sample 4: Total butorphanol
All laboratories have reported the presence of Total butorphanol. No other substances was present in the sample.

Sample 5: Oxymorphone
There were three false negative results submitted for Oxymorphone

Sample 6: Meclofenamic acid

All laboratories have reported the presence of Meclofenamic acid.

Sample 7: Etodolac

All laboratories reported the presence of Etodolac.

Sample 8: Blank

This sample was a blank plasma. Two laboratories reported the presence of substances. One for Clenbuterol and one for Glycopyrrolate.

Sample 9: 5-OH dantrolene

All laboratories reported the presence of 5-OH dantrolene.

Sample 10: Testosterone

The assessment has been based on an acceptable result being within +/- 40% of the Assigned Value based on all results submitted. Therefore the SDPA has been set to 7.49 pg/ml which is 20% of the Assigned Value of 37.47 pg/ml.

All submitted results were assessed to be satisfactory.

This sample was subject to full homogeneity analysis in which 10 samples were chosen at random and analysed in duplicate but at random.

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Individual Report

This individual report contains a summary of all the results submitted and the performance assessment for your laboratory/individual analysts. Please note that the nominated results for each analyte are indicated by the blue highlight in the analyst field.

Full details of the scheme, sample types and data analysis can be found in the corresponding Main Report, along with any technical comments, if applicable. The main report is the definitive version.

If you have any questions regarding your results which are not answered in the Main Report, please contact us using the details provided on the front of the report. If you would like to order any samples for re-testing please visit our web shop at www.lgcstandards.com or contact your local LGC representative.

Results Summary

Sample	Results Reported	Satisfactory Results	Questionable Results	Unsatisfactory Results	Not Assessed
PT-RM-01	1	1	0	0	0
PT-RM-02	1	0	0	1	0
PT-RM-03	1	1	0	0	0
PT-RM-04	2	1	0	0	1
PT-RM-05	1	1	0	0	0
PT-RM-06	1	1	0	0	0
PT-RM-07	1	1	0	0	0
PT-RM-08	1	1	0	0	0
PT-RM-09	1	1	0	0	0
PT-RM-10	1	1	0	0	0
Round Total	11	9	0	1	1

Result which are Not Assessed should be review by comparing them with the assigned value and other relevant statistics given in the main report. Participant, according to their internal quality criteria, may consider Not Assessed results to be satisfactory, questionable or unsatisfactory. Further information regarding why results may not be assessed is given in the Scheme Information section of the main report.

Please note surplus PT sample are available as QC materials once the round has closed. These samples can be purchased at a reduced rate if you have taken this sample during the main round. Visit our web shop at www.lgcstandards.com and search for the sample you require.

For the following analytes you obtained an unsatisfactory result:

Sample	Analyte
PT-RM-02	2 - Drug identification

No questionable results in this round

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
1 - Drug identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
2 - Drug identification	Result	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	6-methyl-naphthyl acetic acid	9	33.3%	66.7%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
3 - Drug identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Benzoylecgonine	Benzoylecgonine	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
4 - Drug identification	Drug 1	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Total butorphanol	Total butorphanol	9	100.0%	0.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)
4 - Drug identification	Drug 2	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected		5	0.0%	80.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

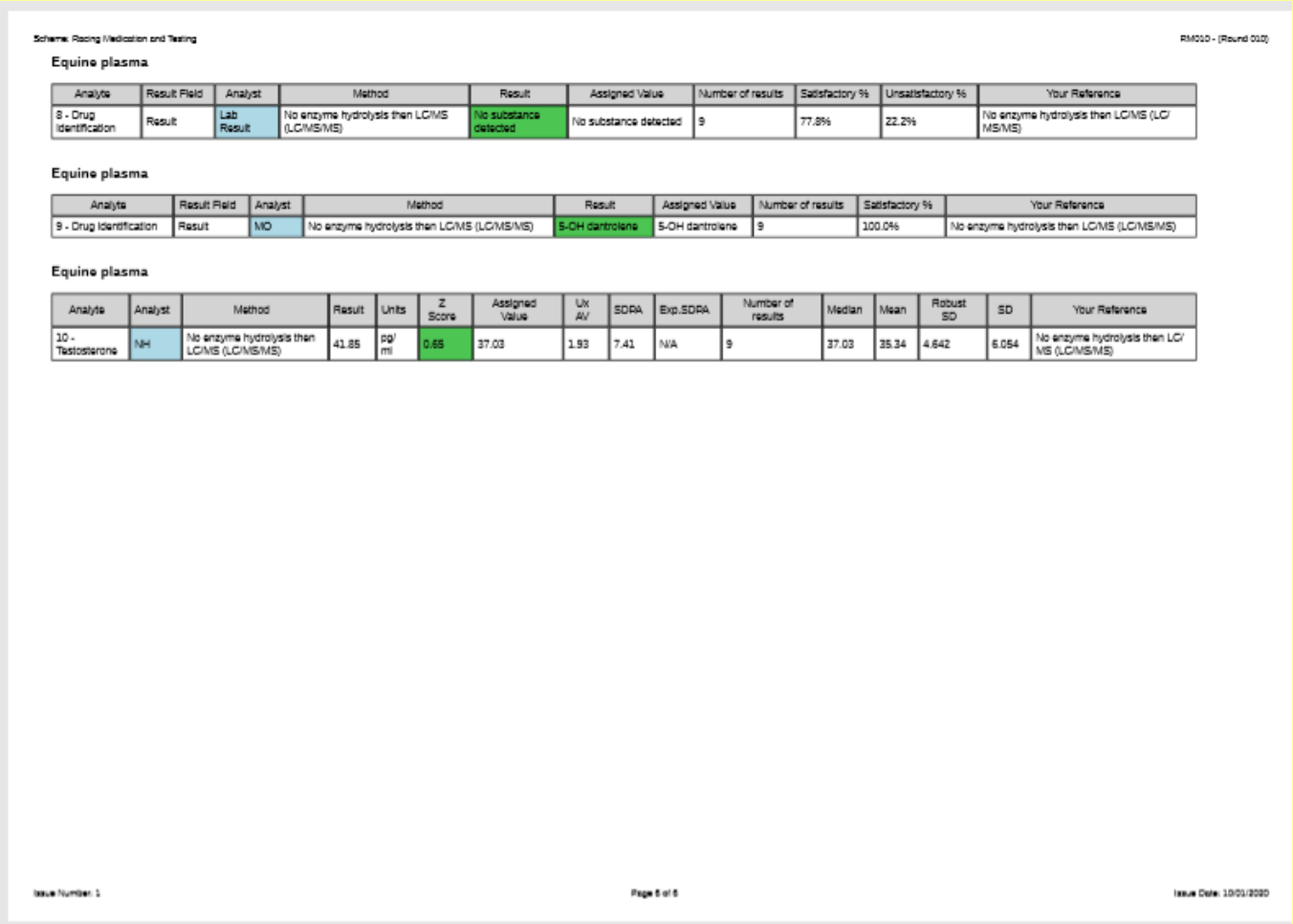
Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
5 - Drug identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Oxymorphone	Oxymorphone	9	66.7%	33.3%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
6 - Drug identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Meclofenamic acid	Meclofenamic acid	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
7 - Drug identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Etodolac	Etodolac	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)



Scheme: Racing Medication and Testing RM010 - (Round 010)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
8 - Drug identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	77.8%	22.2%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
9 - Drug identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	5-OH dantrolene	5-OH dantrolene	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Analyst	Method	Result	Units	Z Score	Assigned Value	Ux AV	SDRA	Exp.SDRA	Number of results	Median	Mean	Robust SD	SD	Your Reference
10 - Testosterone	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	41.85	pg/ml	0.65	37.03	1.93	7.41	N/A	9	37.03	35.34	4.642	6.054	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Issue Number: 1 Page 5 of 6 Issue Date: 10/01/2020

As you can see from the above report, our laboratory detected, but could not confirm the presence of 6-MNA, along with 5 other laboratories. A subsequent investigation into the circumstances led to the dismissal of this result for ALL laboratories (i.e. the drug was disqualified from the test batch). We encourage you to contact the proficiency test administrator (RMTC), through Dr. Mary Scoally, the Executive Director of the RMTC for verification or questions.

2.4.1.11 Affirm that the laboratory is capable of handling a significant number of blood samples for total carbon dioxide (“TCO2”) testing.

Industrial laboratories has the capability of screening the number of samples requested by the State of Indiana for total carbon dioxide.

2.4.2 TESTING OF SAMPLES

2.4.2.1 Provide existing or proposed ISO/IEC 17025 accreditation including scope(s) of accreditation.

Industrial Laboratories was one of the first racing labs in the United States to become accredited with the American Association for Laboratory Accreditation (A2LA) in 1995. We have maintained our accreditation since then.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

INDUSTRIAL LABORATORIES COMPANY[1,2]
4046 Youngfield Street
Wheat Ridge, CO 80033
Joanne Compton Phone: 303 287 9691

CHEMICAL

Valid To: March 31, 2021 Certificate Number: 2239.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment to A2LA's Competition Animal Drug Testing requirements), accreditation is granted to this laboratory to perform animal drug testing for the detection and confirmation (qualitative and quantitative) of prohibited substances as defined by individual client rules on blood (plasma/serum), urine, hair testing and other animal specimens (as defined by client-defined rules related to animal medications):

Test Technologies	Test Methods
Specific Gravity by Refractometry	IL-DTS-M-019
Immunoassay ELISA	IL-DTS-M-022 and IL-DTS-M-056
Ion Selective Electrode TCO_2	IL-DTS-M-045
Chromatography/Spectrometry	
High Performance Liquid Chromatography/Mass Spectrometry Triple Quad Ion Trap	IL-DTS-M-003 and IL-DTS-S-002

The scope of drug coverage for screening and confirmation testing, when not defined by specific client rules, is guided by the following:

1) Association of Racing Commissioners International, Inc., Drug Testing and Standard Practices Program, Uniform Classification Guidelines for Foreign Substances and Controlled Therapeutic Medication Chart (most current version)
2) RMTC, Controlled Therapeutic Substances List (most current version)
3) AGSC, Drug Testing List (most current version)

[1] This scope meets the A2LA P112 Flexible Scope Policy

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Accreditation is also granted to this laboratory to perform the following types of tests on Dietary Supplements, Food Products, Pet Products and Feed, and Environmental Samples:

Test Methods	References	Test Descriptions
IL-ACD-M-010	AOAC: 925.09, 950.46, 930.15	Moisture Determination
IL-ACD-M-036	AOAC 969.33 (Modified)	Determination of Fatty Acids by GC
IL-ACD-M-043	In-house Test Method	Cannabinoids in Hemp by HPLC

[2]This accreditation covers testing performed at the main laboratory listed above, and the satellite laboratory listed below:

3980 Youngfield Street
Wheat Ridge, CO 80033
Joanne Compton Phone: 303 287 9691

In recognition of the successful completion of the A2LA evaluation process (including an assessment to A2LA's Competition Animal Drug Testing requirements), accreditation is granted to this laboratory to perform drug testing for the detection and confirmation (qualitative and quantitative) of prohibited substances as defined by individual client rules on contraband, blood (plasma/serum), urine, hair testing, and other animal specimens (as defined by client-defined rules related to animal medications):

Test Technologies	Test Methods
High Performance Liquid Chromatography/Mass Spectrometry Triple Quad Ion Trap	IL-DTS-M-003 and IL-DTS-S-002
High Resolution LC/MS/MS- Time of Flight Mass Spectrometry	IL-DTS-W-026

Key:
AGSC: American Graded Stakes Committee
AOAC: Association of Official Analytical Communities
AORC: Association of Official Racing Chemists
RMTC: Racing Medication Testing Consortium
USP: United States Pharmacopoeia

Accredited Laboratory

A2LA has accredited

INDUSTRIAL LABORATORIES COMPANY

Wheat Ridge, CO

for technical competence in the field of

Chemical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of A2LA *R203 – Competition Animal Drug Testing Laboratory Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 3rd day of May 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2239.01
Valid to March 31, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Chemical Scope of Accreditation.

2.4.2.2 Provide a description of similar equine contracts performed in the last three (3) years including contact person(s) and telephone number(s).

Following is a list of clients that currently contract Industrial Laboratories' services. We also encourage you to contact our clients for any additional clarification, references, and testament to our successful drug testing program. **Industrial Laboratories has not had a contract terminated before the end of the contract period due to performance issues, quality issues, or problems with our testimony or legal documents.** All our clients are similar in the scope of services that we provide.

State of Arizona – Department of Racing (Currently Horse racing, previously dog racing)
1110 West Washington Street, Suite 260
Phoenix, AZ 85007
(602) 364-1700
Mr. Greg Stiles
gstiles@azgaming.gov

The Industrial Laboratories Company has been an official testing laboratory for the State of Arizona since **1991**.

State of Colorado – Division of Racing Events (Currently Horse racing, previously also dog racing)
1881 Pierce Street, Room 108
Lakewood, CO 80214
(303) 866-6597
Ms. Donia Amick, Director
Donia.Amick@state.co.us

The Industrial Laboratories Company has continuously served as the official testing laboratory for the State of Colorado since **1953**.

State of Indiana - Indiana Horse Racing Commission (Horse and Harness racing)
ISTA Center, Suite 412
150 W Market St
Indianapolis, IN 46204
Ms. Deena Pitman, Executive Director
DPitman@hrc.IN.gov

The Industrial Laboratories Company has been the official testing laboratory for Indiana since **2016**.

State of Iowa
Iowa Racing and Gaming Commission
1300 Des Moines St., Suite 100
Des Moines, IA 50309-5508
Ms. Tina Eick, Director of Operations
tina.eick@iowa.gov
(515) 281-3451

IL was awarded the Iowa contract in April **2018.**

Commonwealth of Kentucky
Kentucky Horse Racing Commission
4063 Iron Works Parkway, Building B
Lexington, KY 40511
Mr. Marc Guilfoil, Executive Director
Marc.Guilfoil@ky.gov
859-246-2040 (Telephone)

The Industrial Laboratories Co. has been the primary testing laboratory for Kentucky since **2018**.

Commonwealth of Massachusetts – Massachusetts Gaming Commission (Horse and Harness racing)
101 Federal Street, 12th Floor
Boston, Massachusetts 02110
Dr. Alex Lightbown, Director
alightbown@MassMail.State.MA.US
(617) 979-8436

The Industrial Laboratories Company has been the official testing laboratory for Massachusetts since **2016**.

State of Michigan – Michigan Gaming Commission (Horse and Harness racing)
Cadillac Place
3062 West Grand Blvd.
Suite L-700
Detroit, MI 48202
Mr. Al Ernst
ErnstA@michigan.gov
(313) 456-4130

The Industrial Laboratories Company has been the official testing laboratory for Minnesota since **2017**.

State of Minnesota – Minnesota Racing Commission (Horse and Harness racing)
P.O. Box 630
1100 Canterbury Road
Shakopee, MN 55379
Dr. Lynn Hovda, Chief Veterinarian
(612) 860-5806 (cell)
Lynn.hovda@state.mn.us

The Industrial Laboratories Company has been the official testing laboratory for Minnesota since **2008**.

State of New Mexico
New Mexico Racing Commission
4900 Alameda Blvd. NE
Albuquerque, NM 87113
Office: 505.222.0714
Mr. Ismael (Izzy) Trejo, Executive Director
Ismael.Trejo@state.nm.us

The Industrial Laboratories Company has been the official testing laboratory for New Mexico since **2018**

State of North Dakota – North Dakota Racing Commission (Horse racing)
500 N 9th Street
Bismarck, ND 58501-4509
Mr. Jack Schulz, Executive Director
701-328-4290
jschulz@nd.gov

The Industrial Laboratories Company has been the official testing laboratory for North Dakota for over twenty years.

State of Oklahoma – Oklahoma Horse Racing Commission (Horse racing)
2401 NW 23rd Street, Suite 78
Oklahoma City, OK 73107
Mr. Kelly Cathey, Executive Director
kcathey@ohrc.gov
(405) 943-6472

The Industrial Laboratories Company has been the official testing laboratory for the State of Oklahoma since **2006**.

State of West Virginia – West Virginia Horse Racing Commission (Horse racing)
State Capital Complex
West Wing, Room 317
Charleston, WV 25305-3327
Mr. Joe Moore, Executive Director
joe.k.moore@wv.gov
(304) 558-2150

The Industrial Laboratories Company has been the official testing laboratory for West Virginia since **2015**.

2.4.2.3 Provide a list of other relevant certifications and/or accreditations, including but not limited to RMTC.

There are no other certifications or accreditations available. The following document is Industrial Laboratories' RMTC Accreditation certificate.

RMTC
Racing Medication & Testing Consortium

THIS CERTIFICATE RECOGNIZES THAT

Industrial Laboratories

HAS BEEN AWARDED RMTC LABORATORY ACCREDITATION

AWARDED THIS 1ST DAY OF MAY, 2014

Alex Waldrop, Chair RMTC Board

2.4.2.4 Provide a detailed report of equine analyses performed for the previous three (3) calendar years. The report must include:

A) Number of equine samples analyzed, categorized as urine, blood (serum or plasma), or hair.

	Urine	Blood	Hair
2020 – year to date (approx..)	6,347	8,524	3,352
2019	28,571	40,680	3,616
2018	24,545	30,114	432
2017	18,837	24,329	46

B) Listing of prohibited drugs detected, during that period, by name and frequency of detection.

Column1	2017	2018	2019
Acepromazine / metabolite(s)	13	4	6
Albuterol	2	19	92
Altrenogest	0	10	12
Ambroxol	0	0	0
Aminocaproic acid	0	9	6
Aminorex	12	1	0
Amitriptyline	1	0	0
Antipyrine / metabolite	0	0	1
Apomorphine	0	0	1
Arsenic	0	3	2
Atenolol	1	0	0
Barbiturates	3	0	0
Benzocaine	0	0	0
Betamethasone	4	23	16
Boldenone	0	4	0
Bromhexine	3	0	0
Budesonide	0	1	0
Bumetanide	0	1	0
Bupivacaine	0	0	1
Butorphanol	2	2	1
Caffeine	13	15	24
Cannabidiol	0	1	6
Capromorelin	0	0	4
Carbazochrome	2	3	4
Cardarine	0	3	6
Carisoprodol	0	1	0
Carprofen	0	1	1
Celecoxib	2	1	0
Cetirizine	0	0	1
Chlorpromazine	0	0	0
Clenbuterol	127	122	274
Clodronic acid	0	0	1
Clonidine	0	0	2
Cobalt	0	4	12
Cocaine / BZE	15	3	5
Cyproheptadine	0	2	0

Dantrolene / metabolite	0	1	1
Deracoxib	0	1	0
Dermorphin	1	0	1
Detomidine	0	3	13
Dexamethasone	66	118	66
Dextrorphan	0	0	0
Diazepam / metabolite(s)	0	0	0
Diclofenac	5	3	19
Diphenhydramine	1	1	5
DMSO	3	2	0
Doxapram	0	0	1
Ephedrine	0	1	0
Etamsylate	0	1	16
Ethyl Glucuronide	1	0	0
Etodolac	0	0	1
Etorphine	1	0	0
Fenoprofen	1	0	0
Fentanyl	0	1	1
Firocoxib	4	3	0
Fludrocortisone	0	1	0
Flufenamic acid	0	1	1
Flumethasone	0	1	0
Flunixin	61	58	54
Fluphenazine	0	0	0
Flurbiprofen	1	0	0
Fluticasone	0	0	1
Formoterol	1	0	5
Furosemide	16	7	20
Gabapentin	3	9	17
Glycopyrrolate	1	5	0
Guanabenz	4	1	0
Heptaminol	0	0	0
Hydrochlorothiazide	0	2	2
Hydrocortisone succinate	2	2	0
Hydromorphone	0	0	1
Hydroxyzine	0	0	2
Ibuprofen	0	2	0

Ipratropium	1	0	0
Isoflupredone	4	9	7
Isoxsuprine	1	2	0
Ketamine	0	0	8
Ketoprofen	14	11	19
Ketorolac	1	0	0
Lamotrigine	2	2	1
Levamisole	9	8	9
Levorphanol	0	0	0
Lidocaine / metabolite	12	11	12
Ligandrol	0	0	2
Lobeline	0	0	0
Meclofenamic acid	1	0	1
Meloxicam	6	1	8
Mephentermine / Phentermine	5	1	0
Mepivacaine	8	6	5
Metandienone	0	23	1
Metaproterenol	1	0	0
Metformin	4	0	0
Methadone	0	0	0
Methamphetamine / Amphetamine	8	2	0
Methocarbamol	21	35	22
Methylphenidate / metabolite	4	1	1
Methylprednisolone	23	13	18
Methyltestosterone	0	1	1
Mitragynine	2	0	3
Modafinil	2	2	0
Morphine	1	0	1
Nalbuphine	0	1	0
Nalorphine	0	0	2
Nandrolone	0	1	2
Naproxen	13	4	8
Nikethamide / metabolite	3	0	0
Omeprazole sulfide	5	5	15
Ostarine	0	0	9
Oxazepam	0	1	0
Oxycodone	1	0	0
Oxymetazoline	1	0	0

Oxymorphone	0	0	1
Pemoline	26	2	0
Pentazocine	0	1	0
Peroxicam	0	1	0
Pethidine	0	0	0
Phenylbutazone	77	88	82
Phenytoin / metabolite	0	0	1
Prednisolone	5	0	1
Procaine	0	0	2
Propantheline	0	0	1
Propranolol	1	0	0
Pyrilamine	1	0	1
Ractopamine	5	0	8
Ranitidine	11	11	11
Reserpine	1	0	1
Romifidine	1	0	0
Sildenafil	1	1	0
Stanozolol	14	3	5
Strychnine	1	0	4
Sufentanil	0	0	1
Temazepam	0	1	0
Tenoxicam	1	0	0
Terbutaline	0	1	0
Testosterone	17	18	38
Theobromine	4	2	9
Theophylline	5	10	3
Tiludronic acid	0	0	3
Tolfenamic acid	1	0	0
Topiramate	1	0	0
Tramadol / metabolite	4	0	0
Tranexamic acid	0	0	1
Trenbolone	0	1	1
Triamcinolone acetonide	21	13	14
Valerenic acid	2	1	0
Velafaxine / metabolite	0	1	4
Xylazine	5	2	8
Yohimbine	0	2	0

Zilpaterol	10	3	26
α-PVP	0	0	2
Total # per year	**740**	**759**	**1088**

C) Number of overages identified for anti-inflammatory drugs and furosemide.

Column1	2017	2018	2019
Antipyrine / metabolite	0	0	1
Carprofen	0	1	1
Celecoxib	2	1	0
Dantrolene / metabolite	0	1	4
Beta - / Dexamethasone	66	118	87
Diclofenac	5	3	20
Etodolac	0	0	1
Fenoprofen	1	0	0
Firocoxib	4	3	2
Fludrocortisone	0	1	0
Flufenamic acid	0	1	1
Flumethasone	0	1	0
Flunixin	61	58	67
Furosemide	16	7	20
Ibuprofen	0	2	0
Isoflupredone	4	9	7
Ketoprofen	14	11	22
Meclofenamic acid	1	0	1
Meloxicam	6	1	8
Methylprednisolone	23	13	23
Naproxen	13	4	8
Phenylbutazone	77	88	103
Prednisolone	5	0	1
Triamcinolone acetonide	21	13	19

D) Number of test results that resulted in testimony provided for administrative or court proceedings.

We are not able to easily track the number of times we provide testimony. Most of the testimony is provided by Petra Hartmann and Tim Krueger, and the jurisdictions that we provide the most testimony for are Arizona, New Mexico and Oklahoma. For accurate feedback regarding our testimony, we kindly suggest that the commission contact the attorneys or Commission staff that have worked with us in multiple hearings.

For the State of Arizona:
Ms. Cassie Goodwin
Administrative Coordinator
Arizona Dept. of Gaming / Racing Division
cgoodwin@azgaming.gov
(602) 255-3876 (direct)
(480) 276-5005 (cell)

For the State of Oklahoma:
Mr. James Rucker
James.Rucker@ag.ok.gov
Deputy General Counsel
Oklahoma Dept of Agriculture, Food and Forestry
(405) 522-5479
(405) 845-5542 (cell)

For the State of New Mexico:
Amye G. Green
agreen@nmag.gov
Assistant Attorney General
New Mexico Office of the Attorney General
Office: 505-490-4058

E) Names of cases and jurisdiction in which testimony was given.

We are not able to provide specific case examples for client confidentiality reasons. Both Ms. Hartmann and Mr. Krueger have a very active hearing record, each averaging between 20-30 hearings per year. Ms. Hartmann, with over 30 years' experience in veterinary drug testing and Mr. Krueger, with over 17 years' experience are experts in the field. Both are professional members of the Association of Official Racing Chemists and have extensive records of testimony in **Arizona, Colorado, Massachusetts, Minnesota, New Mexico, and Oklahoma**.

F) Results of expert testimony. Include information on any determination made by a hearing officer or quasi-judicial officer that the testimony of the laboratory personnel was not credible. Explain the circumstances and provide information on corrective actions taken subsequent to the determination.

To the best of our knowledge, our testimony has never been deemed "not credible".

2.4.2.5 Affirm that if awarded the contract from this RFP that the laboratory will be able to turn around non-graded stakes hair samples within seven (7) days for initial screening and an additional seven (7) days for confirmatory analysis.

Industrial Laboratories hereby affirms our ability to provide hair initial screening results within 7 days of sample receipt, and an additional 7 days for required confirmation testing. Currently in 2020 to date, the lab has analyzed over 3,000 hair samples.

2.4.2.6 Provide two (2) copies of litigation packages used in actual cases. Provide case outcomes and scientific challenges proffered. Identifying information, such as would violate client confidentiality, may be

removed prior to inclusion in the Proposal. If the laboratory has a case that was successfully challenged on scientific merit, it should be submitted as one of the litigation packages. The respondent shall comment on the challenge and provide recommendations for remediation of the existent flaws.

Industrial Laboratories provides our clients with data packets that meet all the criteria set forth in our accreditation requirements:

As per the RMTC 2018 Laboratory Code:

"3.2.6.11 The Laboratory Documentation Package should be provided by the Laboratory only to the relevant result management authority upon request and should be provided within 10 working days of the request. Laboratory Documentation Packages shall contain material specified in the RMTC Technical Document on Laboratory Documentation Packages (Appendix C)."

Appendix C –Laboratory Documentation Packages shall be provided by the Laboratory as required by the External Quality Assurance Program (EQAP) or in support of an Adverse Analytical Finding. The package shall contain information documenting the items listed below. Additional information may be included to document an Adverse Analytical Finding. Deviations from this technical document shall not invalidate the Adverse Analytical Finding(s).

1. All Laboratory Documentation Packages generated by the Laboratory should meet the following formatting requirements:

• A cover page and a signed statement by the Laboratory Director or authorized delegate certifying that the documentation package contains authentic copies of original data, records, and forms;

• Sequentially numbered pages of the documentation package;

• Table of Contents;

• Presentation in a format that will allow proper review by relevant stakeholders;

• Data, charts, graphs, etc. adequately described.

All Laboratory Documentation Packages provided shall contain the following information:

• List of laboratory staff involved in the test, including signatures and/or initials and position title(s) (Each individual's complete signature/name can assist in interpreting the Laboratory Internal Chain of Custody record);
• External chain of custody record;
• Documentation of shipping and receipt of intact sample;
• Documentation linking sample identification number to laboratory identification number (if available);
• Test Sample Laboratory Internal Chain of Custody records;
• Urine analysis results for adulteration or manipulation as per 3.2.4.1 of this document, if completed (not applicable for blood). Page 51 of 55 RMTC Laboratory Accreditation Requirements and Operating Standards Version 3.0 January 2018
• Initial Testing Procedure Data
*• Initial Testing Standard Operating Procedure and/**o**r description;*
• Initial Aliquot Laboratory Internal Chain of Custody record;
• Initial Testing Procedure results on negative control(s), positive control(s), and all sample Aliquot(s) related to the Adverse Analytical Finding;
• Documentation of any deviations from the written Initial Testing Procedures, if any;

• Instrument performance data from the same analytical run; used to verify instrument performance or operation during that run. Data utilized for this purpose shall include instrument performance report(s) and quality control sample data. [For example, tune report from a mass spectrometer or other instrument report; chromatographic performance verification samples, if any; and/or quality control data, if any. This does not refer to data generated at other times (e.g., validation data for the method)].
• Confirmation Procedure Data
*• Confirmation Standard Operating Procedure and/**or** description;*
• Confirmation Aliquot Laboratory Internal Chain of Custody record;
• Confirmation Procedure data on negative control(s), positive control(s), and all sample Aliquot(s) related to the Adverse Analytical Finding;
• Identification data and/or quantitative data and uncertainty estimation, if applicable; [A summary table is to be provided that compiles the necessary data and applicable criteria utilized to identify and/or determine the concentration of the target substance(s) to report an Adverse Analytical Finding or Atypical Finding.]
• Documentation of any deviations from the written Confirmation Procedures, if any; [For example, a change in the split ratio or a dilution of the derivatized sample due to sample overload in the GC-MS or LC-MS; application of an additional cleanup step; or an explanation for the reanalysis of the sample with a new Aliquot]; Page 52 of 55 RMTC Laboratory Accreditation Requirements and Operating Standards Version 3.0 January 2018
• Instrument performance data from the same analytical run; used to verify instrument performance or operation during that run. Data utilized for this purpose shall include instrument performance report(s) and quality control sample data; [For example, tune report from a mass spectrometer or other instrument report; chromatographic performance verification samples, if any; and/or quality control data, if any. This does not refer to data generated at other times (e.g., validation data for the method)];
• Laboratory Test Report. –

Please see the original document on the RMTC website at http://rmtcnet.com/wp-content/uploads/RMTC_Laboratory_Code_2018_Version_3.0.pdf

We generally provide data packets (upon request) within 7 business days of the request.

For the purposes of this RFP, and due to the size of the litigation package, the packets are provided as a separate attachment.

Attachment 2.4.2.6 - Packet Number 1: Provided for a blood finding of "**ostarine", a SARMs drug** (**S**elective **A**ndrogen **R**eceptor **M**odulator)

Attachment 2.4.2.6 - Packet Number 2: Provided for a blood finding of "**levamisole",** a dewormer and immune stimulant.

Client information has been removed to render the packet anonymous. None of our packets have been successfully challenged based on scientific merit. We are not made aware of specific case outcomes, but to the best of our knowledge both cases were successfully resolved.

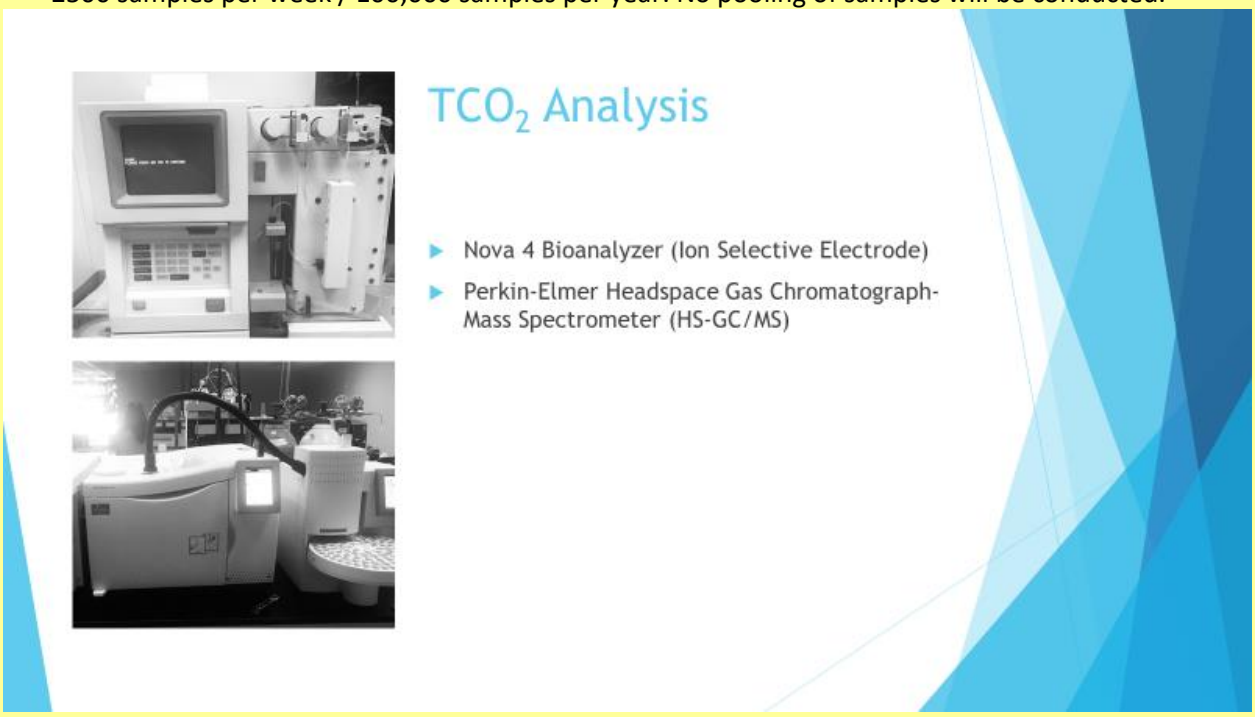
2.4.2.7 Blood samples identified for TCO2 testing shall be subjected to analysis on a Beckman EL-ISE instrument using validated methodology. If the laboratory proposes to employ a different instrument, it must demonstrate the proposed instrument is equivalent to, and provides results consistent with, Beckman equipment.

Samples shall be subjected to analysis within one hundred and twenty (120) hours of collection from the horse. The laboratory shall not analyze samples greater than one hundred and twenty (120) hours post-collection. The laboratory shall promptly notify the regulatory agency of any samples excluded from analysis due to sample age.

Industrial Laboratories has used the Nova 4 Biomedical Analyzer for Total Carbon Dioxide Analysis (TCO_2) for the last 8+ years. The Beckman EL-ISE analyzer was removed from the market by the manufacturer in circa 2012. The Nova 4 uses the same testing principle (**I**on **S**elective **E**lectrode) as the Beckman EL-**ISE** and test results are thus comparable. The instrument has two components: a CO_2 membrane and a pH sensor. The sample is acidified to convert sodium bicarbonate to carbon dioxide, which diffuses through the membrane and dissolves in the internal filling solution, causing a change in pH which is measured. The change in pH is directly proportional to the total CO_2 content of the sample. We use a set of TCO_2 calibrators that are traceable to the National Institute of Standards and Technology (NIST) to establish a calibration curve. All sample values are measured against NIST calibrator values, the procedure that most racing laboratories use for TCO_2 determinations. Due to the discontinuation of the Beckman EL-ISE instrument, the Nova 4 technology has been validated at several racing labs in the US and we have used it for approximately eight (8) years without conflict.

We have also purchased a new Headspace Gas Chromatograph-Mass Spectrometer (HS-GC/MS) to allow us to implement a TCO_2 method validated and in use at the University of Illinois. The new method allows for a more specific detection using mass spectrometry instead of a pH-change and will also increase the range and sensitivity of TCO_2 that can be reliably measured. We have participated in training for the new method (RMTC California workshop, January 2020) and are in the final stages of implementation.

In 2020, year to date, we have tested over 5000 samples. Our estimated capacity is approx..500 samples per day/ 2500 samples per week / 100,000 samples per year. No pooling of samples will be conducted.



Please see the following example of a report for TCO2 testing:

industrial LABORATORIES
Industrial Laboratories is your full-service independent third party analytical laboratory

[redacted]sis

[redacted]

CERTIFICATE OF ANALYSIS

Report # Rpt-201001031

TCO2 REPORT

Date of Report:
October 01, 2020

TRACK: [redacted]

COLLECTION DATE: September 24, 2020

DATE OF RECEIPT: September 29, 2020
SEAL NUMBER: 1166489
DATE OF ANALYSIS: September 29, 2020

SampleCode	Client ID	Sample Type	Authorized Meds	Condition	Results
20092926-001	E395713	TCO2 Blood	Lasix	Good	32.6 mmol/L
20092926-002	E395714	TCO2 Blood	Lasix	Good	33.3 mmol/L
20092926-003	E395715	TCO2 Blood		Good	27.7 mmol/L
20092926-004	E395716	TCO2 Blood	Lasix	Good	27.7 mmol/L
20092926-005	E395717	TCO2 Blood		Good	28.0 mmol/L
20092926-006	E395718	TCO2 Blood		Good	26.8 mmol/L
20092926-007	E395719	TCO2 Blood	Lasix	Good	29.6 mmol/L
20092926-008	E395720	TCO2 Blood		Good	30.3 mmol/L
20092926-009	E395721	TCO2 Blood	Lasix	Good	31.7 mmol/L
20092926-010	E395722	TCO2 Blood		Good	30.3 mmol/L
20092926-011	E395723	TCO2 Blood		Good	31.2 mmol/L
20092926-012	E395724	TCO2 Blood	Lasix	Good	35.4 mmol/L
20092926-013	E395725	TCO2 Blood	Lasix	Good	32.9 mmol/L
20092926-014	E395726	TCO2 Blood	Lasix	Good	30.3 mmol/L
20092926-015	E395727	TCO2 Blood	Lasix	Good	33.8 mmol/L
20092926-016	E395728	TCO2 Blood	Lasix	Good	32.9 mmol/L
20092926-017	E395729	TCO2 Blood	Lasix	Good	31.5 mmol/L
20092926-018	E395730	TCO2 Blood	Lasix	Good	28.2 mmol/L
20092926-019	E395731	TCO2 Blood		Good	33.3 mmol/L
20092926-020	E395732	TCO2 Blood		Good	33.5 mmol/L

Methods : IL-DTS-M-045

20 TCO2 Samples

The results shown on this certificate of analysis apply only to the samples listed above.
The measurement of uncertainty is available upon request.

Digitally Signed By: **Petra Hartmann** Date: 10/01/2020

Director, Drug Testing Services

Main Office: 4046 Youngfield St., Wheat Ridge, CO 80033 Satellite Laboratory Space: 3980 Youngfield St., Wheat Ridge, CO 80033
(303) 287-9691 www.industriallabs.net

2.4.3 GRADED STAKES TESTING

2.4.3.1 Provide assurance of ability to comply with TOBA guidelines or provide an acceptable alternative for the testing of these samples outlined in this RFP.

Industrial Laboratories is pleased to offer Graded Stakes level testing for ALL routine samples. This means we commit to the performance standards outlined in the 2020 testing protocol, as follows:

RCI Class 1 drugs: (20 mandatory drugs)

alfentanil, amphetamine, apomorphine, carfentanil, benzoylecgonine, morphine, dermorphin, etorphine, despropionylfentanyl, hydromorphone, levorphanol, meperidine, normeperidine, mephentermine, methamphetamine, ritalinic acid, oxymorphone, and sufentanil **(plus 30 other Class 1 drugs)**

RCI Class 2 drugs: (22 mandatory drugs)

nortriptyline, buprenorphine, buspirone, caffeine, meprobamate, hydroxycarisoprodol, chlorpromazine, desipramine, dezocine, nordiazepam, oxazepam, temazepam, ephedrine, phenylpropanolamine, fluoxetine, fluphenazine, desipramine, lidocaine, mepivacaine, modafinil, nalbuphine, nalorphine, nortriptyline, propionylpromazine, and tramadol **(plus 52 other Class 2 drugs)**

RCI Class 3 drugs: (43 mandatory drugs)

acepromazine, albuterol, boldenone, bumetanide, butorphanol, clenbuterol, cobalt, derecoxib, detomidine, etodolac, fenoprofen, flufenamic acid, flurbiprofen, formoterol, furosemide, gabapentin, glycopyrrolate, guanabenz, ipratropium, ketorolac, metaproterenol, methyltestosterone, metoprolol, nabumetone, nandrolone, pentazocine, phenylpropanolamine, pirbuterol, piroxicam, procaine, promazine, propranolol, pyrilamine, ractopamine, sildenafil, stanozolol, tenoxicam, terbutaline, testosterone, tetrahydrogestrinone, theophylline, trenbolone, xylazine **(plus 41 other Class 3 drugs)**

RCI Class 4 drugs: (19 mandatory drugs)

betamethasone, dantrolene, dexamethasone, diclofenac, diflunisal, firocoxib, flumethasone, flunixin, ibuprofen, isoflupredone, ketoprofen, meclofenamic acid, methocarbamol, methylprednisolone, naproxen, phenylbutazone, prednisolone, prednisone, triamcinolone acetonide **(plus 28 other Class 4 drugs)**

Our protocol **exceeds** the requirements for TOBA-level testing. We strive to continuously update our methods to keep the target analytes relevant to the needs of the industry.

2.4.3.2 Affirm that if awarded the contract from this RFP, the laboratory will be able to complete confirmatory analysis as necessary on a high volume of hair samples within seven (7) days to ensure that IHRC can take necessary action based upon testing results prior to a graded stakes race.

We hereby affirm that we have the capacity and capabilities to complete all hair testing, including confirmatory analysis, on hair samples taken prior to graded stakes races to help ensure that the IHRC can take timely action as needed, following testing results.

2.4.4 RECORD KEEPING AND RECORD RETENTION

2.4.4.1 Provide a sample “chain-of-custody” document being utilized with a similar client.

Following is a typical chain of custody / sample submission form utilized by our clients:

industrial LABORATORIES

Sample Shipment List

Page ___ of ___

Race Track: _____ Collection Date: _____

Packed By / Date: _____ Seal Number: _____

☐ Post Race Samples ☐ TCO2 Analysis ☐ Out of Competition ☐ Other

Tag Number	Number of Blood Tubes	Number of Urine Cups	Gender (H, M, G, R, F, C)	Declared Medication(s) (L,PBZ)	Comments or Sample Notes (Injured, Work, Claimed, Trainer Submission)

Industrial Laboratories 4046 Youngfield Street Wheat Ridge, CO 80033
303-287-9691
www.industriallabs.net

2.4.4.2 Provide a record retention schedule.

As per our Standard Operating Procedure “Control and Retention of Records” the following procedures apply to the retention of records:

4.2.2 Drug Testing Services (DTS) Department

4.2.2.1 The DTS department client records are maintained by the DTS department director.

4.2.2.2 The DTS client records may include but or not limited to: COCs, test reports, Request for Proposal (RFP), Request for Quotation (RFQ), affidavits, and any other documentation related to the client samples.

4.2.2.3 Client files may be organized in manila folder by race date and race track and filed by jurisdiction. These folders are stored in filing cabinets within the DTS department.

4.2.2.4 All RFP, RFQ, and all other bid or contract information is stored in a separate client folders.

4.2.2.5 The original test report or affidavit is provided to the client and Industrial Laboratories only maintains a copy of the test report or affidavit.

4.2.2.6 DTS client records are only accessible by authorized personnel.

Industrial Laboratories maintains accurate records of samples and all processes associated with the receipt, testing, storage, and disposal of samples. Hardcopy records are maintained in secure document storage for a period of seven (7) years. Electronic records are maintained in accordance with accreditation requirements.

Standard Operating Procedures (SOP's) are controlled documents maintained by our Quality Department. Laboratory staff can access the most current version of all SOP's in both hardcopy and electronic form. Documents are reviewed and signed by laboratory management, who also review the documentation on a regular basis for needed updates. Changes to documents are tracked in the document history section and previous versions of all SOP's are archived for a minimum of seven (7) years.

2.4.5 OWNERSHIP

2.4.5.1 Provide a complete list of all officers and directors of the company as well as any person(s)_ who owns more than 5% of the company or the company stock.

Officers and Directors of the Company:

Chairman of the Board – Mark Wong
Secretary – Gilad Gordon
Treasurer – Loretta Zapp
Director – Seth Wong

Ownership percentage over 5%:

Mark Wong – 45.79%
Seth Wong – 24.69%
Jamie West – 5.14%

Marc Pinto/James Tiampo – 5.14%

2.4.5.2 Please affirm that no person having a direct financial interest in the racing laboratory is a shareholder, officer, partner, or director shall have a direct financial interest in the ownership of race horses, either directly or indirectly, or any other financial interest connected with horse racing.

Industrial Labs hereby affirms that no persons with a direct financial interest in Industrial Laboratories have any direct or indirect financial interest in the ownership of racehorses, or any other financial interest connected with horse racing.

2.4.5.3 Please affirm that no laboratory staff shall have a financial interest in the ownership of race horses, either directly or indirectly, or any other financial interest connected with horse racing.

Industrial Laboratories' hereby affirms that no laboratory staff at Industrial Laboratories have any direct or indirect financial interest in the ownership of racehorses, or any other financial interest connected with horse racing.

2.4.6 STANDARD OPERATING PROCEDURES AND LABORATORY MANUAL

2.4.6.1 Provide a current Standard Operating Procedure Manual and Quality Manual. Describe how the laboratory will archive retired copies of the standard operating procedures in such a manner that the procedures that were used to test each specific sample can be identified.

Within this section is a list of procedures, work instructions, methods, and forms that are available to our staff for training and guidance during the performance of their work. This is not the complete list of documents, as the laboratory process for updating and revising documents occurs is one of continuous improvement and several procedures are in varying stages of updates, review, approval, etc. Our combined total number of procedures and work instructions fills several large binders and numbers in the thousands of pages, all of which are proprietary and confidential. However, as our customer, you are always welcome to review these documents when visiting our facility in person or via teleconferencing.

The specifics of retaining and archiving records and methods are captured in both a standard operating procedure and in our Quality Manual. The relevant excerpt from our Quality Manual reads:

4.3 DOCUMENT CONTROL

4.3.1 General

4.3.1.1 Industrial Laboratories has established and maintains procedures to control all internal documents that are part of its management system as described in SOP, *Document Control,* Lab Code: IL-ADM-S-002. The Quality Assurance department is responsible for the distribution of internal management system documents (Quality Manual, Standard Operating Procedures, Work Instructions, Analytical Methods) and maintains the original files of the current and historical management system documents.

4.3.2 Document Approval and Issue

4.3.2.1 The Quality Assurance department reviews all management system documents prior to issuance to laboratory personnel. Additionally, a qualified person may perform a technical review and approve a management system document.
All management system documents including all active and archived documents as well as the version number are incorporated on a master document list maintained by the Quality Assurance department.

4.3.2.2 The document control procedure ensures the following:

4.3.2.2.1 All departments within the Company have access to current authorized editions of relevant documents for effective operation and performance of tests and related activities.

4.3.2.2.2 Documents are reviewed and revised, when necessary, to ensure continued suitability and compliance with Company, client, and/or regulatory requirements. As part of the annual management review, each laboratory director/manager is responsible for reviewing the list of documents applicable to their area of responsibility and

scheduling any necessary revisions or removal from points of issue.

4.3.2.2.3 Invalid or obsolete document copies are promptly removed from all points of issue and are destroyed to preclude their use.

4.3.2.2.4 Obsolete original documents are stamped "HISTORICAL DOCUMENT DO NOT COPY" and are filed in the Quality Assurance department for legal or knowledge preservation.

4.3.2.3 Management system documents are uniquely identified by the lab code, page number plus total number of pages, the effective date, version number, and area of applicability.

Documents are reviewed and approved by the appropriate personnel plus the Quality Assurance department as noted by the signatures at the front of the original document.

4.3.3 Document Changes

4.3.3.1 Document changes are conducted in accordance with SOP *Document Control,* Lab Code: IL-ADM-S-002.

Pertinent background information for review and approval is provided to designated personnel prior to or at the time of the document review.

4.3.3.2 Document changes are identified using the "Track Changes" function in Microsoft Word and revisions to a document are listed numerically in the History Section of the document. If a significant amount of changes has occurred in a document a new document may be needed to replace the old document. The revised document is filed with the original document.

4.3.3.3 A document may be amended by hand pending re-issue of a revised document. Each hand amendment must be initialed and dated by the person making the amendment along with the appropriate director/manager's initials and date. A copy of the amended document must be promptly submitted to the Quality Assurance department for revision, approval, and reissue. The Quality Assurance department will be responsible for distribution

of copies of hand-amended documents to appropriate areas pending re-issue of the official revised document.

4.3.3.4 Industrial Laboratories provides for authorized access to computerized documents to preclude unauthorized revision. Management system documents that are in a writable file format stored electronically are only accessible to authorized staff members. Document changes are made only to an electronic copy of the original document released and tracked by the Quality Assurance department.

Active management system documents are available for electronic review to staff members in a PDF format for read-only access to protect unauthorized access and modification of electronically stored records.

Management system documents are controlled and listed on a distribution list maintained by the Quality Assurance department.

4.13 CONTROL OF RECORDS

4.13.1 General

4.13.1.1 Industrial Laboratories' policies and procedures for identification, collection, indexing, access, filing, storage, maintenance and disposal of technical and quality records can be referenced in SOP, *Control and Retention of Records*, Lab Code: IL-QAL-S-004.

The Industrial Laboratories Company, Inc.
3980/4046 Youngfield Street
Wheat Ridge, CO 80033

4.13.1.2 All records and reports, internal or issued to clients are legible, retained, and stored so they are readily retrievable. The external document storage facility provides a suitable environment to prevent damage, deterioration, and loss. Records are stored for a minimum of seven years.

4.13.1.3 Client records retained at Industrial Laboratories are held in secure locations and with the strictest confidence.

Client records are not released unless a client submits written authorization to release records to a third party.

4.13.1.4 The process used to back-up and protect records stored electronically is referenced in WI, *Server Back-Up*, Lab Code: IL-IT-W-001.

4.13.2 Technical Records

4.13.2.1 The Industrial Laboratories staff members and management are responsible for keeping the original records of all work performed according to the management system procedures.

The Quality Assurance department is responsible for all quality records including but not limited to, internal and external audits, CAPA reports, proficiency test results, annual management reviews, complaints reports and all other QMS related documents.

Records are made in a permanent and legible manner and contain the date as well as the identity of the personnel responsible for the creation and review of the work.

Industrial Laboratories maintains methods and sufficient information to facilitate reanalysis. In the event that a reanalysis is conducted, these records ensure a repeat analysis is performed as close to the original analysis as possible. Records are maintained for a minimum of seven years.

4.13.2.2 Observations, data, and calculations are recorded at the time they are made and are identifiable to the specific test and sample by use of an internally generated sample number that is cross linked to the client code.

4.13.2.3 The use of white out, sharpies, black ink, or other means to cover up recording(s) is not permitted. Corrections to hard-copy records must be made by a single strike through the item requiring change and initialing and dating each correction. Changes to electronic

data are tracked and require a new version to avoid changes to original data.

Following is an overview of a selection of available procedures. We invite the IHRC and/or staff to visit our facility and review our documentation personally or conduct a video conferencing review. **Our laboratory methods contain sensitive and proprietary information and fill several large binders and it would be far to cumbersome and risky to ship this documentation and risk accidental publication.** This is why we invite clients to our facility in person to examine our documents or view them through remote conferencing to minimize the risk of jeopardizing the integrity of the doping control process.

IL-DTS-W-002_ Operation and Maintenance of the Dynex Technologies Microplate Washer_Ver1__Post
IL-DTS-W-003_SPE for Acidic,Basic, and Neutral Drugs_Ver2_Post
IL-DTS-W-004_ReceiptLoginHandling and Disposal of Drug Testing Samples_Ver5 Post
IL-DTS-W-005_Reagent Receipt and Storage for ELISA Test Kits_ Ver1_Post
IL-DTS-W-006_SPE for AcidicBasic and Neutral Drugs in Canine and Equine Urine_Ver2_Post
IL-DTS-W-007_Glassware Cleaning Procedure for Drug Testing Services Lab _Ver2_Post
IL-DTS-W-008_Operation of the Automatic Dishwasher for Drug Testing Services Lab _Ver1_Post
IL-DTS-W-009_ Standard Verification and Certification_ Ver1_Post
IL-DTS-W-010_Data Review and Processing_Ver2_Post
IL-DTS-W-011_Laboratory Documentation Packages for the Drug Testing Services Department, _ Ver1_Post
IL-DTS-W-012_SPE for AcidicBasic and Neutral Drugs in Biological Matrices using 96Well Plates_Ver 3_Post
IL-DTS-W-013_SPE for AcidicBasic and Neutral Drugs in Urine using 96Well Plates_Ver 4_Post
IL-DTS-W-014_Operation and Maintenance of Biotage 96+ Positive Pressure Manifold_Ver1_Post
IL-DTS-W-015_Operation and Maintenance of Biotage SPE Dry 96_Ver1_ Post
IL-DTS-W-016_Operation, Calibration, and Maintenance of NOVA 4 Bioanalyzer_Ver1_ POST
IL-DTS-W-017_Matrix Gemini LIMS Use for the Drug Testing Services Department_Ver1_ Post
IL-DTS-W-018_Operation and Maintnenance of the PRECYLLES Evolution_Ver1_Post
IL-DTS-W-019_Operation and Maintenance of the Shimadzu OnLine Degasser_Ver1_Post
IL-DTS-W-020_Operation and Maintenance of the Shimadzu System Controller_Ver1_ Post
IL-DTS-W-021_ Operation and Maintenance and Calibration of the Shimadzu Autosampler_Ver1_Post
IL-DTS-W-022_ Operation Maintenance and Calibration of the Shimadzu Solvent Delivery System_Ver1_ Post
IL-DTS-W-023_ Operation Maintenance and Calibration of the Shimadzu Column Oven_Ver1_Post
IL-DTS-W-024_ Operation Maintenance and Calibration of the ABI 4500 Q Trap Mass Spectrometer_Post
IL-DTS-W-025_The Operation, Maintenance, and Calibration of the OpsysMR ELISA Plate Reader_Ver 1_Post
IL-DTS-W-026 Operation Maintenance and Calibration of the Sciex X500R QTOF Mass Spectrometer_Post
IL-DTS-WI-027 Sample Preparation and Shipment for Metals Analysis_ Ver1_Post
IL-LAB-W-002 Operation, Calibration, and Maintenance of the Mettler Toledo Analytical Balance_Ver1_Post

IL-DTS-M-003_ Target Screen Drug Substances by LCMSMS_Ver4_Post
IL-DTS-M-004_ Clenbuterol Quantification in Equine Plasma by LCMSMS_Ver5_Post
IL-DTS-M-005_Oxycodone Quantification and Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-006_ Prednisone and Prednisolone Quantification and Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-007 Fluphenazine Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-008 Mephentermine and Phentermine confirmation LCMSMS_Ver1_Post
IL-DTS-M-009_Methocarbamol Quantification and Confirmation in Equine Plasma by LCMSMS_Ver3_Post
IL-DTS-M-010_Firocoxib Quantification and Confirmation in Equine Plasma by LCMSMS_Ver2_post
IL-DTS-M-011_Triamcinolone Acetonide Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-012_Determination of PBZ and OXY in Equine Plasma by HPLC_Ver4_Post
IL-DTS-M-013_ Methylprednisolone Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-014_Caffeine Quantification and Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-015_Furosemide Quantification and Confirmation in Equine Plasma by LCMSMS_Ver2_Post
IL-DTS-M-016_ Testosterone Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-017_ Carisprodol and Meprobamate Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-018_ Strychnine Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-019_ Measurement of Specific Gravity in Urine_Ver1_Post
IL-DTS-M-020_HEPS Quantification and Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-021_HEPS Quantification and Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-022_Enzyme-Linked ImmunoSorbent Assay_ELISA Drug Testing_Ver 3_Post
IL-DTS-M-023_Clenbuterol Confirmation in Equine Urine_Ver1_Post
IL-DTS-M-024_Caffeine and Metabolites Confirmation In Equine Urine by LCMSMS_Ver 1_Post
IL-DTS-M-025_Dexamethasone Quantitation and Confirmation In Equine Plasma or Serum by LCMSMS_Ver 2_Post
IL-DTS-M-026_Triamcinolone Acetonide Quantitation and Confirmation In Equine Plasma or Serum by LCMSMS_Ver 2_Post
IL-DTS-M-027_Naproxen Confirmation In Equine Plasma or Serum by LCMSMS_Ver 1_Post
IL-DTS-M-028_Diclofenac Confirmation In Equine Plasma or Serum by LCMSMS_Ver 1_Post
IL-DTS-M-029_Boldenone Sulphate Quantification and Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-031_MDVP Quantification and Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-032_Mephentermin and Phentemine Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver1_Post
IL-DTS-M-033_Xylazine Confirmation in Equine Plasma or Serum by LCMSMS_Ver1_Post

IL-DTS-M-034_Xylazine Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-035_Stanozolol Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-036_Thebaine Confirmation in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-037_Thebaine Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-038_Boldenone Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-039_Dermorphin Screen in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-040_Dermorphin Confirmation in Equine Plasma by LCMSMS_Ver2_Post
IL-DTS-M-041_Procaine Quantification and Confirmation in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-042_Ambroxol Confirmation in Equine Plasma or Serum by LCMSMS_Ver1_Post
IL-DTS-M-043_Phenylpropanolamine Confirmation in Equine Plasma or Serum by LCMSMS_Ver1_Post
IL-DTS-M-044_Aminocaproic Acid and DMSO screen in equine plasma using LC-MSMS_Ver1_Post
IL-DTS-M-045_Determination of the Total Concentration of all Forms of TCO2 in Plasma and Serum Samples by ISE_Ver2_post
IL-DTS-M-046_The Quantification and Confirmation of Flunixinx in High Concentration Equine Plasma Samples by LCMSMS_Ver1_Post
IL-DTS-M-047_The Quantification and Confirmation of Flunixin in Low Concentration Equine Plasma Samples by LCMSMS_Ver1_Post
IL-DTS-M-048_The Confirmation of Chlorpromazine in Equine Plasma by LCMSMS_Ver1_Post
IL-DTS-M-049_Amphetamine and Methamphetamine Confirmation in Equine Urine Using LCMSMS_Ver1_Post
IL-DTS-M-050_Quantification and Confirmation of Pemoline in Equine Urine by LCMSMS_Ver2_Post
IL-DTS-M-051_Quantification and Confirmation of Pemoline in Equine Plasma or Serum by LCMSMS_Ver2_Post
IL-DTS-M-052_Norpropoxyphene Confirmation in Equine Urine by LCMSMS_Ver1_post
IL-DTS-M-053_Carbazochrome Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-054_Zilpaterol Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-055_Methadone Confirmation in Equine Plasma or Serum by LCMSMS_Ver1_Post
IL-DTS-M-056_EPO Testing by ELISA_Ver1_Post
IL-DTS-M-057_Lamotrigine Confirmation in Equine Serum or Plasma by LCMSMS_Post
IL-DTS-M-059 NalbuphineConfirmation in Equine Urine by LC-MSMS_Ver1_Post
IL-DTS-M-060_Etorphine Confirmation in Equine Urine by LCMSMS_Ver1_Post
IL-DTS-M-061_Strychnine Confirmation in Equine Urine by LC-MSMS_Ver1_Post
IL-DTS-M-063_Benzoylecgonine Confirmation Method in Equine Urine by LCMSMS_Post
Il-DTS-M-065_Target Screen in Hair by LC-MSMS_Ver1_Post

- 3200 Prev-maint-1
- GEN-2
- IL-LAB-S-001_ The Use and Calibration of the Balances_Ver1_Post
- IL-LAB-S-002__ Control of Cerificate of Analysis_Ver1_Post
- IL-LAB-S-003_Verification of Calibrated Equipment or Materials When Out of Direct Control of the Laboratory_Ver3_Post
- IL-LAB-S-004_Policy For Manual Integrations on Chromatographic Data Systems_Ver1_Post
- IL-LAB-S-005_Sample Retention and Disposal_Ver1_Post
- IL-LAB-S-006_Chemical, Reagent, and Standard Tracking_ Ver1_Post
- IL-LAB-S-007_Estimation of Measurement Uncertainty in Analytical Test Results_ Ver1_Post
- IL-LAB-S-008_Laboratory Waste Management Plan_ Ver1_Post
- IL-LAB-S-009_ Documentation of Deviations_Ver1_Post
- IL-LAB-S-010_Data Audit Trails_ Ver1_Post
- IL-LAB-S-011_Sample Transportation, Receipt, Handling, and Storage_Ver1_Post
- IL-LAB-S-012_ Comprehensive Equipment Calibration Program_Ver1_Post
- IL-LAB-S-013_ Equipment handling, Storage, Use, and Maintenance Program_Ver1_Post
- IL-LAB-S-014_ Deionized Water Testing_Ver1_Post
- IL-LAB-S-015-Data Review_Ver1_Post
- IL-LAB-W-002_ Operation, Calibration, and Maintenance of the Mettler Toledo Analytical Balance_Ver1_Post
- IL-LAB-W-003_ Labeling, Inventory, Calibration, and Out of Servie of Equipment_Ver1_Post
- IL-LAB-W-004_ Operation Calibration and Maintenance of the Mettler Toledo pH Meter_Ver1_Post
- IL-LAB-W-005_ Operation, Calibration, and Maintenance of the Microliter Pipettes_Ver1_Post
- IL-LAB-W-007_ Operation and Maintenance of the Walk-In Cooler_Ver1_Post
- IL-LAB-W-010_ Operation and Maintenance of the Temperature Controlled Storage Units_Ver1_Post
- IL-LAB-W-011_The Operation and Maintenance of Centrifuges_Ver 1_Post
- IL-LAB-W-012_Preparation Storage and Disposal of QueCher salts for use in ACD_Ver1_Post

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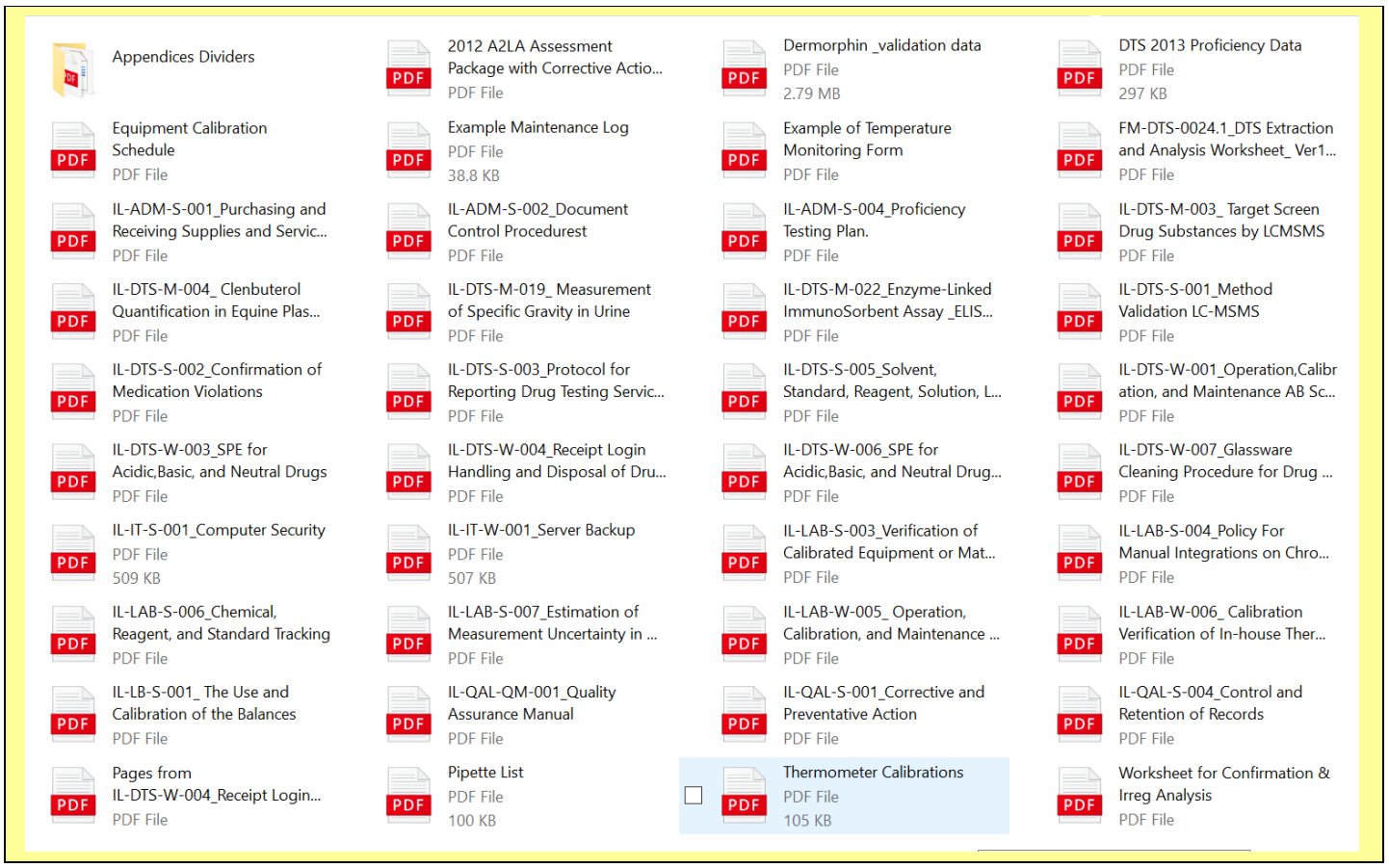
Size: 251 KB
Date modified: 4/

- IL-ADM-S-001_Purchasing and Receiving Supplies and Services_ Ver3_Post
- IL-ADM-S-002_Document Control Procedures_Ver3 Post
- IL-ADM-S-003_Preparation and Formatting of SOPs,WIs, and Methods_Ver1 Post
- IL-ADM-S-004_Proficiency Testing Plan_Ver5_ Post
- IL-ADM-S-005_Company Complaints_Ver3_Post
- IL-ADM-S-006_Administration and Documentation of Company Training_Ver2_Post
- IL-ADM-S-007_Facility Cleaning and Sanitation Procedures_Ver1_ Post
- IL-ADM-S-008_Review of Requests,Bids,Tenders, and Contracts_Ver1_ Post
- IL-ADM-S-009_Review of Incoming Work_Ver1_ Post
- IL-ADM-S-010_Change Control Procedures_Ver1_ Post
- IL-ADM-S-011_The Use of the A2LA Logo_Ver1_ POST
- IL-ADM-S-012_Subcontracting of Tests_ Ver1_Post

- FM-ADM-0001.2 Log-In Review Checklist_Original
- FM-ADM-0002.0_Employee Group Training Form
- FM-ADM-0003.0_Individial Employee Training Form
- FM-ADM-0004.1 Document Review Form_Original
- FM-ADM-0006.0-Employee Initial Demonstration of Proficiency Training Form_Post
- FM-ADM-0007.1-IL-Customer Complaint Form
- FM-ADM-0008.0 External Training Form_Original
- FM-ADM-0009.0 Sample Receipt and Exception Form_Original
- FM-ADM-0010.0 Training File Review Form_Original
- FM-ADM-0011 1_Industrial Laboratories Vendor Quality Survey_Post
- FM-LAB-0001.0_Secondary Reagent Material Log.pdf - Shortcut
- FM-LAB-0003.0_Temperature Monitoring Form_Original
- FM-LAB-0004.0_Temperature Monitoring Form_Digital Thermometers_Original
- FM-LAB-0006.0_Primary Control Log Form_Original
- FM-LAB-0007.1_Re-Prep_Reanalysis Form Post
- FM-LAB-009.1_Daily Use Pipette Calibration Verification Log_Original
- FM-LAB-0010.1_Exposure Incident Report_Original
- FM-LAB-0011.0 pH Meter Calibration Log Form_Original
- FM-LAB-0013.0 Maintenance Log Form_Original
- FM-LAB-0014.0 Out of Claim Form_Original
- FM-LAB-0015.0 Document Deviation Form_Original
- FM-LAB-0016.0 Daily DI Water Check_Original
- FM-LAB-0017.0 Drinking Water Internal COC_Original
- FM-QA-0002.0-IL Proficiency Sample Spiking Procedure_Original
- FM-QAL-0008.6_Corrective and Preventative Action and Root Cause Analysis Report ForM
- FM-QAL-0013.1_Document Request Form_Original
- FM-QAL-0055.0_Thermometer Calibration Verification Using PRT and Reader Form_Original
- FM-QAL-0061.0 Annual Management Review Form_Ver1_Original
- FM-QAL-0081.0 _CAPA Amendment Form_Original
- FM-QAL-0082.0_Temperature Calibration Verification Form_Original
- FM-QAL-0084.0 _Change Control Request Form_Original
- FM-QAL-0087.0 Risk Analysis Form
- IL-LAB-S-012_ Comprehensive Equipment Calibration Program_Ver1_Post
- IL-LAB-S-015-Data Review_Ver1_Post
- x500-qtof-system-user-guide-en

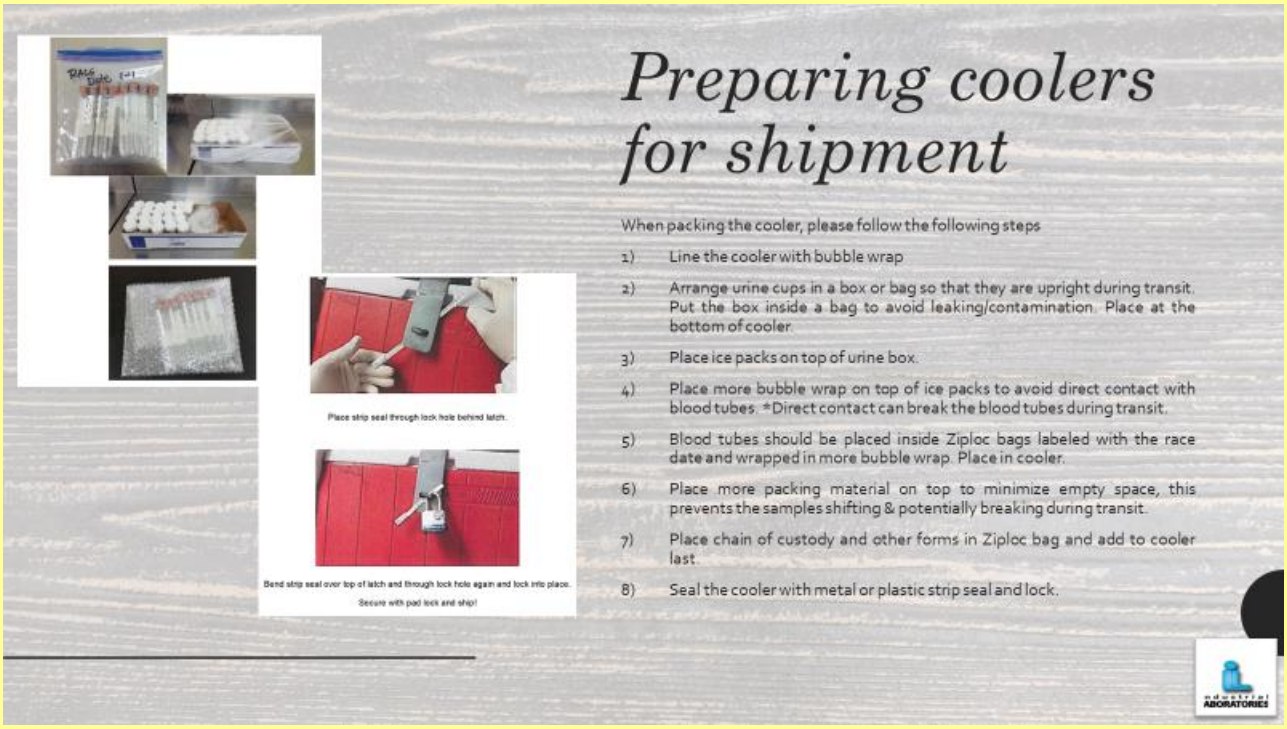


2.4.7 COLLECTING AND SHIPPING SAMPLES

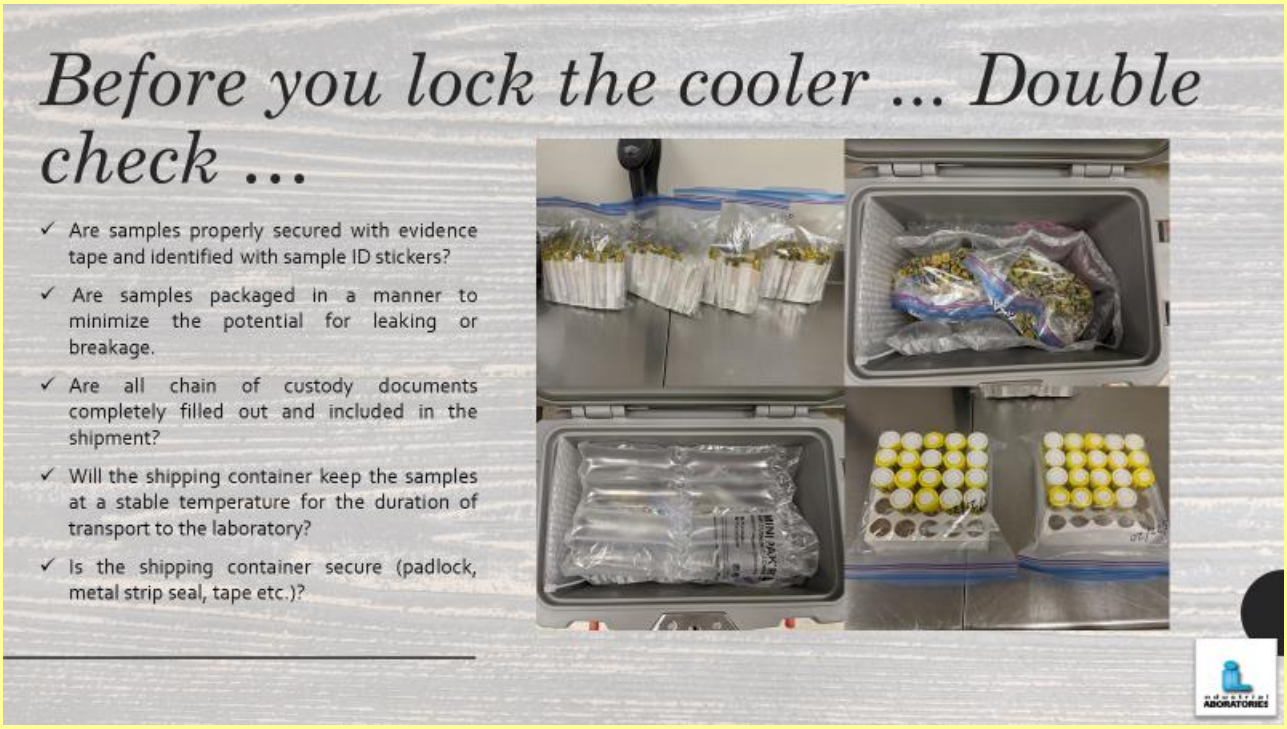
2.4.7.1 Please submit a sample of the following with the proposal, unless otherwise indicated. Further specifications can be found in section 1.4.6 Summary Scope of Work.

A) Sample Container – lockable, insulated, secure containers. All sample shipping containers must be fitted with locks and hasps to ensure sample integrity and security. The containers should be insulated against extreme heat and cold. Please submit a photograph of actual shipping containers to be used including a photograph of the lock and hasp closure. The IHRC reserves the right to request a physical sample. Please submit a schematic of how the shipping container should be packed for shipment in order to ensure the integrity of the samples. Include the dimensions of the shipping container and maximum number of blood and urine samples each shipping container can hold.

Industrial Laboratories will be glad to provide physical specimens at the request of the commission. In lieu of physical samples, these slides and explanations provide a snap shot of materials available to the test barn and veterinarians to exemplify the materials we send, and the manner in which coolers should be prepared to properly ship back to the laboratory.



We have a variety of shipping containers in different sizes, all outfitted with hasps that allow for the attachment of a lock and a metal strip seal. The standard cooler that we have been sending to Indiana test barns has dimensions of 22x13x13 inches and is capable of holding at least three race days' worth of blood and urine samples.



B) Collection cups with lids – sealed, leakproof and unbreakable containers with a minimum capacity of 250 milliliters.

The collection supplies we currently ship to Indiana do not include this size cup. The state currently uses 120 mL wide-mouth cups for collection and 30 mL transport containers for shipping and storage of primary and split urine samples. This approach is efficient, saves on waste plastic, and minimizes storage and shipping volume without

compromising testing volume. However, if the IHRC wishes to switch to a larger container, we can accommodate the larger cup size.

C) Split sample cups with lids – sealed, leakproof 100 milliliter specimen cups for frozen storage.

This cup meets the requirements as specified in Item C and again is an illustration for those in the test barn and/or submitting samples, the optimal means to submit those samples.

We can offer a wide variety of urine collection and storage containers, in sizes ranging from 90 mL to 250 mL. We can also provide collecting poles with custom fitted cup holders in varying lengths.

D) Blood tubes – 12.5 mL serum separator vacuum tubes including SS tubes for split blood sample collection and storage. If multiple tubes of blood are necessary to fulfill the testing requirements of IHRC, please provide a number of tubes per sample and reason(s) why multiple tubes are necessary.

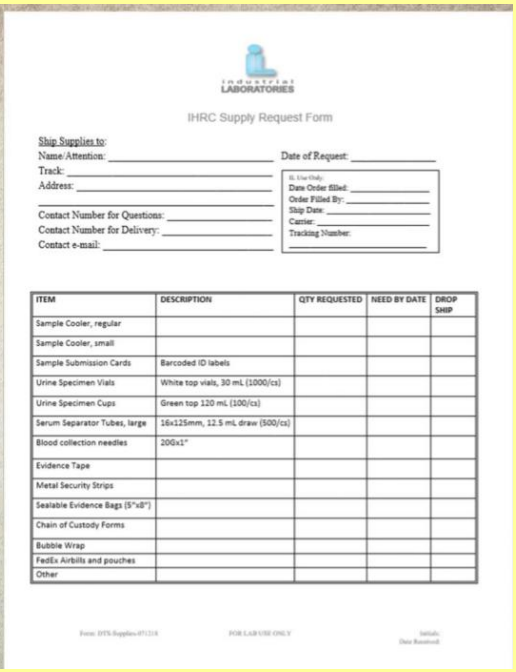
Industrial Laboratories will provide the commission with 12.5 mL Serum Separator tubes. The company placed a large order at the very beginning of the COVID pandemic and has ample supply for the next year. Below are guidelines to properly prepare samples and optimal conditions for collection.

E) Needle – 20 gauge 1” vacutainer needles.

Industrial laboratories can provide 20 gauge 1” vacutainer needles. The company can also provide a variety of needles for multi-tube sampling if desired. Individual preferences vary from 18 gauge to 20 gauge, from 1 inch to 1.5 inch length. We can provide supplies per your instructions.

F) Sample tickets and tamper proof evidence seals for blood and urine samples.

Industrial Laboratories will provide the commission with sample ID tags and evidence tape. Examples of the materials are provided here.



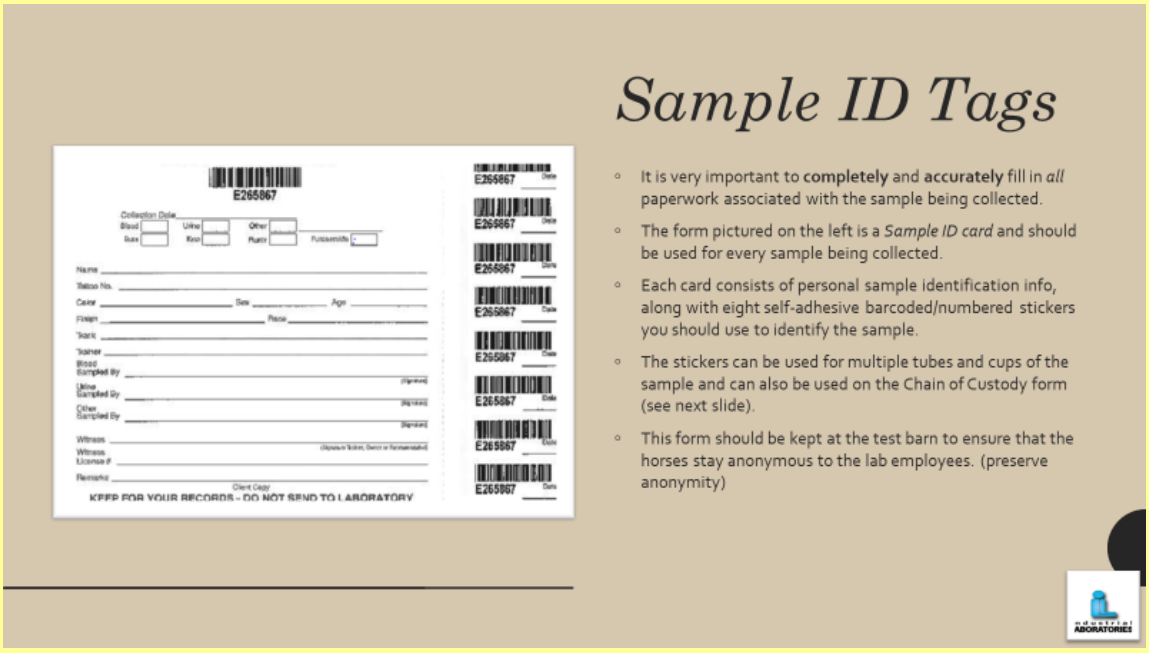
industrial LABORATORIES

IHRC Supply Request Form

Ship Supplies to:
Name/Attention: _____ Date of Request: _____
Track: _____
Address: _____
_____
Contact Number for Questions: _____
Contact Number for Delivery: _____
Contact e-mail: _____

Use Only:
Date Order filled: _____
Order Filled By: _____
Ship Date: _____
Carrier: _____
Tracking Number: _____

ITEM	DESCRIPTION	QTY REQUESTED	NEED BY DATE	DROP SHIP
Sample Cooler, regular				
Sample Cooler, small				
Sample Submission Cards	Barcoded ID labels			
Urine Specimen Vials	White top vials, 30 mL (1000/cs)			
Urine Specimen Cups	Green top 120 mL (100/cs)			
Serum Separator Tubes, large	16x125mm, 12.5 mL draw (500/cs)			
Blood collection needles	20Gx1"			
Evidence Tape				
Metal Security Strips				
Sealable Evidence Bags (5"x8")				
Chain of Custody Forms				
Bubble Wrap				
FedEx Airbills and pouches				
Other				



2.4.7.2 List and describe fully the material to be shipped to the race tracks for sample collection, sample containment, sample preparation, sample identification, sample security (sealing), sample packing and shipment, container security and sample documentation. Additionally, include proposed supplies shipment schedule for each race meet (harness and flat racing).

All collection and shipping supplies will be maintained at the tracks and all supplies for the season will, pending availability, be sent in a single shipment prior to the beginning of the season, for both harness and flat racing, no later than 2 days prior to the start of racing. Generally, Industrial Labs employs a system of shipping in bulk directly

from our vendors to the tracks, although we maintain emergency inventory at the laboratory to prevent back-ordered supplies from impacting or interfering with sample collection. If the test barn staff needs additional supplies, they can call, e-mail, or insert a supply order form into the cooler with the samples to notify us of such a demand. When urgent requests are made the lab can provide rapid response from our in-house stock, although larger quantities will need be ordered through our vendors. Smaller items can be shipped to the track in the empty coolers that are returned.

We can provide the test barns with the following collection supplies:

- Securable, insulated shipping containers of suitable size
- Ziplock bags, both gallon and quart-sized, for sample packaging to provide extra leak protection
- Metal strip seals (numbered)
- Locks (keyed)
- Urine collection cups, 1 per sample, 90 mL 250 mL capacity, sterile, with lids
- Urine specimen cups, 2 per sample, 30 – 90 mL capacity, sterile, with leak-proof caps
- Serum separator tubes, 3 per sample, 12.5 mL capacity, Vacutainer brand
- Needles, multi-draw, 1 per sample, 20-gauge, 1 ½ inch length,
- Needle holders
- Sample ID tags, sequentially numbered, barcoded, with 8 removable stickers for use on specimen containers and paperwork, 1 per sample
- Evidence tape strips, in bundles or rolls, in sufficient quantity to use approx. 4-6 inches per specimen container
- Sample Chain of Custody form / Sample Collection Form
- Shipping paperwork for Federal Express shipments from track to laboratory

2.4.7.3 Affirm the ability to ship additional samples as directed for non-pari-mutuel (out of competition) testing.

We can provide the commission with extra coolers, of different sizes, for the non-routine collection of out-of-competition samples. For trial races, or any testing requiring expedited turn-around times, we can make special shipping arrangements, including weekend deliveries.

2.4.7.4 Provide courier name and sample shipping schedule.

We propose to maintain the use of Federal Express, for priority overnight shipping service, to be shipped as follows:

Indiana Grand proposed **weekly** shipping days: (exact days depend on when the cooler is ready for shipment)
Shipment 1: ship Monday and Tuesday races on either Tuesday or Wednesday
Shipment 2: ship Wednesday and Thursday races on either Thursday or Friday.

INDIANA HORSE RACING COMMISSION

2020 Race Dates

April

S	M	T	W	TH	F	S
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

S	M	T	W	TH	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

S	M	T	W	TH	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

S	M	T	W	TH	F	S
			1	2	3	4*
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Indiana Derby

August

S	M	T	W	TH	F	S
						1
2	3	4	5	6	7	8*
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

S	M	T	W	TH	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

October

S	M	T	W	TH	F	S
				1	2	3*
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24*
25	26	27	28	29	30	31

November

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

All Quarter Horse Race Days

indicated above

Indiana Derby

July 8th

Thoroughbred/QH Racing

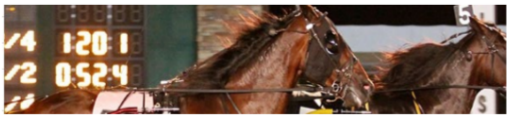
Post Time

2:20 PM

All 2020 Race Dates approved by the Indiana Horse Racing Commission May 28, 2020

Hoosier Park proposed **weekly** shipping days: (exact days depend on when the cooler is ready for shipment)
Shipment 1: ship Tuesday/ Wednesday races on either Wednesday or Thursday
Shipment 2: ship Thursday/Friday/Saturday races on Monday

Harrah's HOOSIER PARK RACING & CASINO



INDIANA HORSE RACING COMMISSION

2020 Race Dates

March/April

S	M	T	W	TH	F	S
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

S	M	T	W	TH	F	S
					1	2*
3	4	5	6	7	8	9
10	11	12	13	14	15	16*
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

S	M	T	W	TH	F	S
	1	2	3	4	5	6*
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

S	M	T	W	TH	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	TH	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14*	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	*Dan Patch				

September

S	M	T	W	TH	F	S
		1	2	3	4	5*
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
*7:10 pm post						

October

S	M	T	W	TH	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
Breeders Crown						

November

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Standardbred Racing
Post Time @ 6:30 pm
Special posts are indicated on dates
Dan Patch August 14
Breeders Crown Oct 30 & 31

All 2020 Race Dates approved by the Indiana Horse Racing Commission May 28, 2020

2.4.8 METHODOLOGY

2.4.8.1 Provide a description of instrumental methods of analysis proposed including:

A) The scope of drug coverage by instrumental methods, specifying where applicable, preferred methods for individual drugs or their metabolites to include each of the following:

i. GC/MS (gas chromatography/mass spectrometry) or GC/MS^n
ii. LC/MS (liquid chromatography/mass spectrometry) or LC/MS^n
iii. HPLC/PDA (high performance liquid chromatography/photo diode array)
iv. HPLC/MS

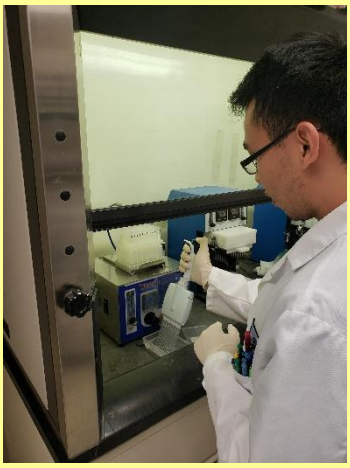


Figure 1 Analyst performing Solid Phase Extraction (SPE)

Industrial laboratories will utilize instrumental screening, as it is the state-of-the-art drug screening protocol in modern laboratories. *Our LC-MS/MS based instrumental screen analyzes for over 450 different drugs in a single analysis, and in every sample you submit for testing. There is no rotation of coverage – every blood sample will be tested for every drug in the target menu. This test provides you with coverage for all the important drugs used therapeutically, all threshold drugs, and drugs used for doping. For threshold drugs, the level is checked against a quantitative calibrator to determine if the level is greater than the threshold. Any sample that appears in excess of the threshold is re-analyzed using quantitative methods to provide you with the exact concentration in the sample with a measurement of uncertainty.*

SOLID PHASE EXTRACTION

Industrial Laboratories uses solid phase extraction procedures utilizing a mixed mode column that allows for the extraction of acidic, basic, and neutral drug compounds from urine and blood samples. Solid phase extraction yields a clean extract from a smaller sample size using a minimum amount of organic solvents.

This technique offers the advantage of semi-automation using positive pressure manifolds which ensure extraction consistency across batches of samples. The method involves a simple process of conditioning columns, applying the prepared samples, washing the columns to remove interferences, and eluting the retained drug compounds. The eluted material is dried down in a temperature-controlled Turbo-Vap under pressure from Nitrogen gas, and then re-dissolved in the appropriate solvent for instrumental screening. The advantages of this system include faster processing time, a more precisely controlled extraction environment, and a more environmentally friendly process due to reduced organic solvent use.

After completion of Solid Phase Extraction for sample clean-up, samples are loaded onto one of four AB Sciex **4500 Q-Trap** (LC-MS/MS) for routine testing of blood and/ or urine samples. *This is arguably the most important portion of the testing program.* Our efficient, custom method screens each sample for over 450 drugs in approximately seven (7) minutes per sample. Each batch of samples is accompanied by positive and negative control samples, which must meet quality control criteria for batch acceptance. Instrument performance is verified daily by analyzing a mixture of test compounds to ensure accurate mass determination. The results of each sample's instrumental analysis, as well as control results, are documented on a batch sample worksheet, which is submitted for secondary review by a certifying scientist. The certifying scientist will update the logbook with sample results and initiate further testing of suspect samples.

While we are unable to publish the full list of compounds covered in our analysis (to prevent malicious use of the information if it inadvertently becomes public knowledge), we are willing to let you review the drug scope list either during an in-person visit to the lab or during a teleconference. our screening targets include the following drug classes:

Drug class:	***Drugs being tested by instrumental screening:***
Anabolic Steroids	boldenone, nandrolone, testosterone, stanozolol, trenbolone, and others.
Analgesics	buprenorphine, butorphanol, morphine group, codeine, fentanyl, hydromorphone, oxymorphone, oxycodone, pethidine, zomepirac, and others.
Anti-histamines	chlorpheniramine, oxymetazoline, cetirizine, and others.
Anti-depressants	bupropion, citalopram, nortriptyline, and others.
Beta-agonists	clenbuterol, albuterol, zilpaterol, ractopamine, formoterol, and others.
Beta-blockers	acebutolol, carteolol, nadolol, oxprenolol, propranolol, and others.
Bleeder medication	Aminocaproic acid, etamsylate, tranexamic acid, carbazochrome
Bronchodilators	albuterol, salmeterol, theophylline, and others.
Corticosteroids	dexamethasone, betamethasone, methylprednisolone, flumethasone, triamcinolone acetonide, prednisolone, prednisone, isoflupredone, and others.
Diuretics	acetazolamine, amiloride, hydrochlorothiazide, ethacrynic acid, bumetanide, and others.
Local Anesthetics	lidocaine, procaine, mepivacaine, benzocaine, bupivacaine, and others.
Muscle Relaxants	carisoprodol, methocarbamol, cyclobenzaprine, dantrolene, and others.
NSAID's	phenylbutazone, flunixin, ketoprofen, firocoxib, celecoxib, carprofen, meloxicam, nabumetone, naproxen, meclofenamic acid, and others.
Stimulants	caffeine, methylphenidate, Bath salts (MDPV etc.), methamphetamine, amphetamine, cocaine, strychnine, and others.
Tranquillizers	acepromazine, acetophenazine, alprazolam, chlorpromazine, lorazepam, reserpine, fluphenazine, meprobamate, xylazine, ketamine, detomidine, and others.
Therapeutics	isoxsuprine, pyrilamine, pergolide, and others.

All the analytical methods used on this equipment have been properly validated, documented, and are proven suitable for the detection of pharmacologically relevant concentrations of regulated compounds in official racetrack samples.

B) Identification of substances for exclusion from instrumental screening and justification for said exclusion to include each of the following:

i. GC/MS (gas chromatography/mass spectrometry) GC/MS^n
ii. LC/MS (liquid chromatography/mass spectrometry) LC/MS^n
iii. HPLC/PDA (high performance liquid chromatography/photo diode array)
iv. HPLC/MS
v. Other instrumental methods that achieve the stated goals of the commission

Metals (Cobalt, Nickel, Arsenic, etc.) - testing will be conducted by ICP-MS, due to the nature of the analyte, which is not easily conducive to LC-MS testing

Blood-doping agents – testing will be conducted by ELISA for erythropoietin and darbopoietin, as proteins present analytical challenges that keep instrumental approaches cumbersome and expensive

Growth Hormone / Growth Factors - testing will be conducted by ELISA, as proteins present analytical challenges that keep instrumental approaches cumbersome and expensive.

C) The relevant standards used for identification to include each of the following:

i. GC/MS (gas chromatography/mass spectrometry) GC/MS^n
ii. LC/MS (liquid chromatography/mass spectrometry) LC/MS^n
iii. HPLC/PDA (high performance liquid chromatography/photo diode array)
iv. HPLC/MS
v. Other instrumental methods that achieve the stated goals of the commission

Industrial Laboratories adheres to standards for identification set forth by the Association of Official Racing Chemists (AORC) – please see the following Guideline for details.

AORC Guidelines for the Minimum Criteria for Identification by Chromatography and Mass Spectrometry

1. This document provides a set of internationally-agreed recommendations for the comparison of chromatographic and mass spectral data consistent with ILAC-G7 Part B "Guide for Establishing the Presence of Prohibited Substances". The AORC recognises that these represent guidelines for analysts and laboratories, whose responsibility it is to ensure the quality and integrity of the data is defensible and fit for purpose. Furthermore, AORC laboratories should have their own minimum criteria defined and documented.

GENERAL ANALYTICAL REQUIREMENTS

2. In general, chromatographic separation coupled to mass spectrometric detection can be sufficiently specific to be used alone as a confirmatory method.

3. The injection sequence for a confirmatory batch should be consistent with Part B Clause 14 of the ILAC-G7 document. An example of a sequence appropriate to a range of analytical circumstances is as follows:
   - Negative control (can also serve as system blank for non-threshold substances)
   - System blank
   - Test sample to be confirmed
   - Reagent blank or negative control
   - Reference sample (reference material or other positive control)

CHROMATOGRAPHY

4. When using a suitable internal standard or marker, the relative retention time (RRT) of the analyte in the test sample should not vary from that in the reference sample by more than the following:
   - +/- 1% for gas chromatography (GC)
   - +/- 2% for liquid chromatography (LC).

5. Otherwise the following absolute retention time criteria should apply:
   - +/- 1% or 6 seconds for GC (whichever is the greater)
   - +/- 2% or 12 seconds for LC (whichever is the greater)

6. When using high resolution separations techniques, such as ultra high performance liquid chromatography (UHPLC), the maximum difference in retention time of the reference standard and the test compound should be within +/- 50% of the half height-peak width or 3 seconds, whichever is larger.

7. Laboratories using high efficiency separation techniques other than UHPLC, should set criteria appropriate for the technique used.

LOW RESOLUTION MASS SPECTROMETRY

8. For any full-scan MS technique, a minimum number of 3 ions is required to be selected, from the test (sample) spectrum, for the purpose of matching their relative abundances (R.A.) with those in the reference spectrum obtained within the same injection sequence.

9. The ions selected for matching should be a molecular ion, quasi-molecular ion or fragment ion whose presence and abundance are relatively more characteristic of the test substance (analyte). The molecular ion or quasi-molecular ion must be included if it is present at a R.A. of greater than 5% in the test spectrum.

10. For product-ion scan MS/MS techniques, the selection of the precursor ion (even if it is also the molecular or quasi-molecular ion) for matching should be avoided. However, in case of insufficient ions it may still be selected, provided its R.A. in the test spectrum is between 10% and 80%.

11. Further techniques or derivatisations may be used in combination if a single technique produces less than 3 ions suitable for matching.

12. The signal of any ion used for matching must be significantly above the background level (noise). Typically, the signal to noise ratio should be well above 3:1 in the single ion traces.

13. Within the common mass range, all ions that can be ascribed to the analyte and appearing in the reference spectrum with R.A. greater than 10% must also be present in the test spectrum. This requirement is independent of those in Clauses 14-16 for the ions selected for matching.

    Maximum permitted difference (tolerance) for the matching ions:

14. The relative abundance (R.A.) is the abundance of a particular ion relative to that of the most abundant ion (base peak) expressed as a percentage. R.A. may be calculated by integrating signals of single ion traces or from background-subtracted mass spectra.

15. The maximum permitted differences in R.A. are as follows:
    - Single-stage MS: 10% absolute or 30% relative, whichever is the greater
    - MS/MS & related techniques: 20% absolute or 40% relative, whichever is the greater.

    These criteria apply to all common ionisation techniques in the full scan mode, irrespective of the type of mass analyser used.

16. The maximum permitted difference (tolerance) in R.A. in the test spectrum may be absolute or relative, and is always calculated with respect to the R.A. of the corresponding ion in the reference spectrum:

R.A. of matched ion in reference spectrum	Full-scan single-stage MS: Acceptable R.A. in test spectrum (10% absolute or 30% relative)	Full-scan MS/MS & related techniques: Acceptable R.A. in test spectrum (20% absolute or 40% relative)
100% (Base Peak)	70-100%	60-100%
90%	63-100%	54-100%
80%	56-100%	48-100%
70%	49-91%	42-98%
60%	42-78%	36-84%
50%	35-65%	30-70%
40%	28-52%	20-60%
30%	20-40%	10-50%
20%	10-30%	0-40%
10%	0-20%	0-30%
5%	0-15%	0-25%
1%	0-11%	0-21%

Extraneous ions:

17. The presence of extraneous ions with m/z larger than 100 in the test spectrum should each not exceed 20% R.A. unless it can be demonstrated to be extraneous using extracted ion chromatograms. This may be calculated from a background-subtracted spectrum or from single ion traces.

Application of background correction (subtraction):

18. The approach to background subtraction should be consistent across a batch of samples. The details of the background subtraction applied should be appropriate to the individual sample.

SIM:

19. Since full-scan data is preferred to selected-ion monitoring (SIM) for the confirmation of the presence of an analyte in a sample, tighter criteria should be applied. A minimum of 4 ions should be used with a maximum permitted difference in R. A. of 10% absolute or 25% relative, whichever is greater.

SRM:

20. For comparison of selected reaction monitoring (SRM) data a minimum of 3 transitions should be used with a maximum permitted difference in R.A. of 10% absolute or 30% relative, whichever is greater. The use of non-characteristic transitions such as loss of water or TMSOH should be avoided where suitable alternatives exist.

HIGH RESOLUTION ACCURATE MASS MS

21. In general, when compared to mass spectra obtained using unit mass resolution and nominal mass assignment, the use of accurate mass data provides additonal confidence in the attribution of a mass peak or ion chromatogram to a confirmatory analyte. This increased confidence allows some relaxation in the criteria applied to confirmatory analysis.

22. The mass error for any ion in either the test spectrum or the reference spectrum is calculated by subtracting the measured mass from the exact mass derived from the chemical formula (allowing for charge). The use of mass error is prefered but can only be determined when the formula of the ion is known.

23. The mass difference for any ion in the test spectrum is calculated by subtracting the measured mass of this ion from the measured mass of the corresponding ion in the reference spectrum.

24. Accurate mass data may be presented either in the form of mass spectra (full scan data) or as extracted ion chromatograms (EIC). The criteria applied to extracted ion chromatograms should be treated as equivalent to SIM (in the case of single stage MS) or SRM (in the case of tandem mass spectrometry).

25. The low resolution mass spectrometry criteria stated in clauses 8-20 above and 28 to 32 below apply equally to high resolution techniques.

26. The requirements in clauses 10, 13 & 17 shall not apply for accurate mass MS provided that the mass error (or mass difference) for each ion selected for matching or the mass width of extracted ion chromatograms shall be within ±5 ppm or ±2 mDa (whichever is greater).

27. Ions arising from a non-characteristic neutral loss should not be selected where the precursor ion has been used for matching and where suitable alternatives exist.

Protein and peptide based analytes:

28. Laboratories working on macromolecules other than proteins and peptides should set criteria appropriate for the technique and mass range used.

29. Harmonised definitions:
Peptides are usually less than or equal to 100 amino acids.
Proteins are much longer and normally contain more than 100 amino acids.
Proteolytic peptides are all peptides resulting from enzyme digestion (i.e: trypsin, V8...).
Proteotypic peptides are discriminative peptides resulting from enzyme digestion.
Bottom up is referred as the confirmation of a protein / peptide molecule by the analysis of its specific proteotypic peptide fragments.
Top-down is referred as the confirmation of an intact protein / peptide by direct mass spectrometric analysis (without enzyme digestion).

30. The sequence of the target protein (whether using a bottom up or top down method) must be demonstrated to be unique in terms of its likely presence in the analytical matrix. For example, BLAST searches or similar proteomic tools should be used to identify any proteins / peptides which contain an identical sequence. Where such proteins / peptides are identified the likelihood of their being present in the analytical matrix along with the probability that cleavage of that protein to generate a peptide identical to the sequence of the analyte should be evaluated. The definition of 'uniqueness' will be context dependent i.e. in some cases it may be sufficient to demonstrate that the sequence is not known to be present in the species in questions, whereas in others it may be necessary to go further than this.

31. The amino acid sequence of a protein could be similar among different species or synthetic analogues. As a result, the proteotypic peptide identified for confirmatory purposes might be the same among various species or synthetic analogues. As long as the protein from any of these species or the synthetic analogues should not be naturally present in the matrix of the animal tested, it would represent a contravention of the rules.

32. The maximum permitted difference (tolerance) in R.A. for protein and peptide analysis:
    - SIM / ion chromatograms extracted from single stage MS data (4 ions minimum) 10% absolute or 30% relative, whichever is the greater,
    - Single-stage full-scan MS (3 ions minimum) or SRM / ion chromatograms extracted from MS/MS or related techniques (3 transitions minimum): 20% absolute or 40% relative, whichever is the greater
    - Full-scan MS/MS and related techniques (3 ions minimum): 25% absolute or 45% relative, whichever is the greater

REFERENCE MATERIALS

33. The suitability of reference materials used in chromatographic and mass spectrometric analyses shall be consistent with Part B Clause 16 of the ILAC-G7 document. Materials of known, certified content are preferable for use as reference materials. Where these are not available, the source of a reference material should be documented in detail and its identity validated.

34. It is acceptable to use any of the following as positive control to obtain reference data:
    - Extracted or non-extracted reference material
    - Extract from a sample-matched matrix spiked with a reference material
    - Isolate from a sample taken after an authenticated administration of the appropriate substance.
    - Isolate from an *in-vitro* incubation of the appropriate substance with liver cells or microsomes.

35. The mass spectral or the deconvoluted mass spectra for polycharged proteins and chromatographic data obtained from the protein (top down) peptide(s) (bottom up) must be compared to those of a standard (in the case of 'bottom up' methods either produced synthetically or derived from a proteolytic cleavage equivalent to that used to analyse the target protein).

36. In any case, the mass spectral (and chromatographic) data obtained should be attributable to the analyte concerned.

Ratio of sample and reference material concentrations:

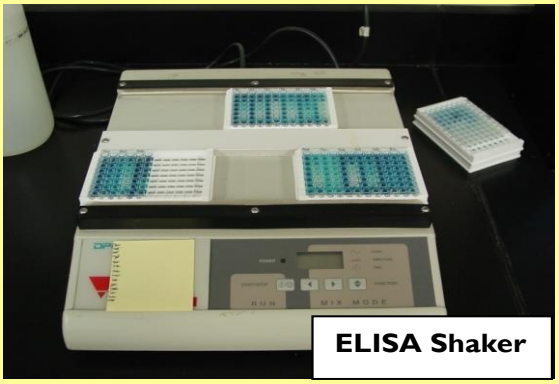
37. The mass spectral and chromatographic data obtained from the reference material should provide a definitive data set for comparison with those from the unknown test sample. The reference material concentration used should be such that the retention time and mass spectral data obtained are unaffected by instrumental or matrix affects. It is not necessary to match the concentrations of test and reference samples, although it is good practice to consider the potential for variations in mass spectral and chromatographic data due to concentration or matrix effects.

- END -

D) Standard Operating Procedures for each of the instrumental screening methodologies to be performed by the laboratory.

2.4.8.2 Description of panel of immunoassay test proposed including scope of drug coverage

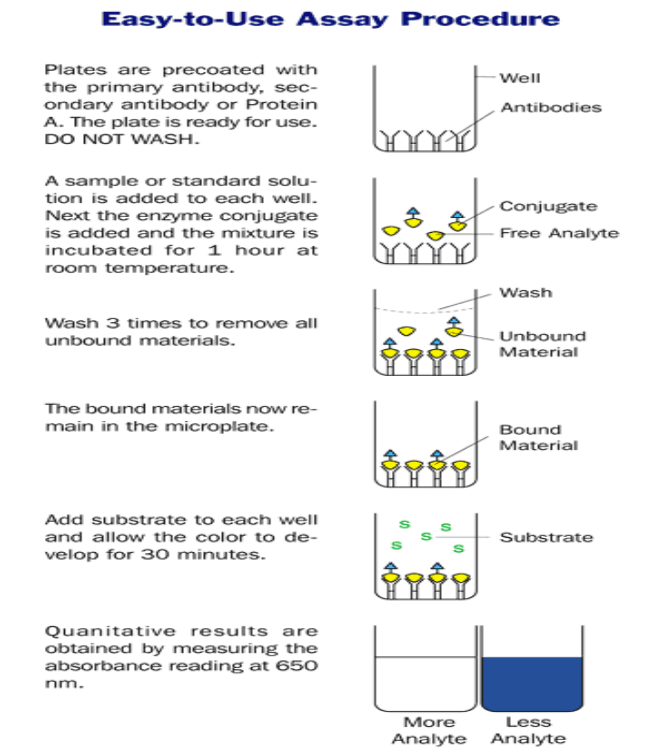
A) Describe fully and provide justification for selecting the proposed ELISA tests to be performed as a complement to instrumental screening methods.


ELISA Shaker

Most racing laboratories use a varying number and type of ELISA kits. Industrial Laboratories proposes to select **six (6)** ELISA kits to screen your **urine** samples for those substances that are not easily covered by instrumental screening in blood, or as an adjunct to enhance detection of low-level concentrations of Class 1 or 2 medications in urine. ELISA kits cannot serve as a stand-alone screening method because the number of available kits is insufficient to offer the type of broad-spectrum coverage necessary for most modern medication surveillance programs. ELISA testing is considered a supplement to instrumental screening.

Industrial Laboratories was one of the first veterinary drug testing laboratories in the world to evaluate and routinely use ELISA screening tests. Over the years, IL has evaluated and used test kits supplied by different vendors in an effort to secure the highest quality kits for our clients. The majority of our ELISA test kits are supplied by **Neogen Corporation**. We consistently research newly available kits for use on our clients' samples.

The adjacent diagram is a brief technical overview of ELISA testing (This is the general procedure followed for Neogen kits).



The amount of color developed is measured in a spectrophotometer and compared to negative and positive control samples. The sample results are statistically evaluated to determine cutoff values for suspicious samples, which are then further analyzed by liquid chromatography – mass spectrometry techniques to determine if a drug violation is present.

B) Identify proposed ELISA tests to be performed daily. Provide a list of available tests for inclusion in rotations.

Industrial Laboratories proposes to use the following ELISA tests daily:
Bronchodilator group
Carfentanil

Etorphine
Methylphenidate
Ractopamine
Zilpaterol

C) Describe all immunoassay tests to be offered including the scope of drug coverage and the limits of detection.

Assay	Sample Type	Description	Cross-reactivity	
Bronchodilator Group *(Neogen Corporation)*	Routine post-race urine samples	A drug group that enhances respiration by dilating airways through means of relaxing muscles associated with the lungs. **RCI Class 3** I-50: 1.1ng/mL	Terbutaline 100%	Clenbuterol 45%
			Salbutamol/Albuterol 35%	Pirbuterol 33%
			Cimaterol 30%	Metaproterenol 20%
			Hydroxymethylclenbuterol 16%	Propranolol 3.3%
			Hydroxyclenbuterol 2.5%	Isoproterenol 0.98%
			Colterol 0.45%	Metoprolol 0.10%
			Procaterol 0.08%	Amphetamine <0.1%
			Ascorbic Acid (Vitamin C) <0.1%	Atenolol <0.1%
			Dobutamine <0.1%	Dopamine
			(3-Hydroxytyramine) <0.1%	Fenfluramine <0.1%
			Hydrocortisone <0.1%	4-Hydroxyamphetamine <0.1%
			Labetalol <0.1%	Methylene Blue <0.1%
			6β-Methylprednisolone <0.1%	Oxyprenolol <0.1%
			Phendimetrazine <0.1%	Phenylephrine <0.1%
			Ritodrine <0.1%	
Carfentanil *(Neogen Corporation)*	Routine post-race urine samples	Synthetic opioid used for veterinary purposes to anesthetize large animals. **RCI Class 1** I-50: 0.1ng/mL	Carfentanil 100%	Acrylfentanyl 0.02%
			Sufentanil 0.5%	Cyclopropylfentanyl 0.02%
			Alfentanil 0.2%	Furanylethylfentanyl 0.02%
			Fentanyl 0.06%	β-Methylthiofentanyl 0.02%
			B-Methylfentanyl 0.06%	Butyrfentanyl 0.01%
			Lofentanil 0.04%	p-Chlorisobutyrylfentanyl 0.01%
			Norsufentanil <0.05%	Methoxyacetylfentanyl 0.01%
			Acetylfentanyl 0.02%	
Etorphine *(Neogen Corporation)*	Routine post-race urine samples	A semi-synthetic opioid used to immobilize large animals. **RCI Class 1** I-50: 0.14 ng/mL	Etorphine 100% No other significant cross-reactivity detected	

Methylphenidate *(Neogen Corporation)*	Routine post-race urine samples	Can be used as a stimulant, commonly known as Ritalin. **RCI Class 1** I-50: 1.5ng/mL	Methylphenidate 100% Ritalinic Acid 0.7%
Ractopamine *(Randox)*	Routine post-race urine samples	A growth promotant which stimulates lean muscle growth. Commonly used in livestock. **RCI Class 2** LOD: 0.6ng/mL	Ractopamine 100% Dobutamine < 0.8% Isoxsuprine <0.6% DL-Isoproternol <0.5% Ritodrine <0.5% Methyl Clenbuterol <0.05% Fenoterol <0.05% Pirbuterol 0.05% Tulobuterol <0.05% Dopamine <0.01% Salbutamol <0.01% Clenbuterol <0.01% Metaproterenol <0.01% Terbutaline <0.01% Cimaterol <0.01% Bamethane <0.01% (-) Isoproternol <0.01% Mabuterol <0.01%
Zilpaterol *(Randox)*	Routine post-race urine samples	Beta-2 adrenergic agonist used to increase size. **RCI Class 2** LOD: 0.08ng/mL	Zilpaterol 100% Brombuterol < 1% Bromchlorbuterol< 1% Cimaterol < 1% Cimbuterol <1% Clenbuterol <1% Clenpenterol <1% Clenproperol <1% Clorprenaline <1% Fenoterol <1% Hydroxymethyl Clenbuterol <1% Mabuterol <1% Mapenterol <1% Ractopamine <1% Salbutamol <1% Terbutaline <1% Tulobuterol <1%
Erythropoietin *(MDBio Sciences & R&D Systems)*	Routine post-race blood samples, OOC, Injuries, Special drug screens	**RCI Class 1** Minimum detectable dose (MDD) 0.6mIU/mL Suspect results from the ELISA will be confirmed using LC-MS/MS	**Specificity** The complete sequence of the Epo protein was compared with sequences in the Protein Identification Resource and the Swiss-Protein data bases. Recombinant and natural human Epo sequences are identical; no significant homology with other human proteins was found. When assayed in the Quantikine IVD Human Epo ELISA, the WHO standard 88/574 (recombinant human Epo) showed similar reactivity relative to WHO standard 67/343 (natural human Epo). Each of the following analytes was spiked to 1 µg/mL in Specimen Diluent and run as an unknown in the assay. No cross-reactivity was observed. **Recombinant human:** ANG, β-ECGF, FGF basic, GROα, IFN-γ, IGF-I, IGF-II, IL-1β, IL-1ra, IL-2, IL-3, IL-4, IL-5, IL-6, IL-6 sR, IL-8, IL-9, IL-10, IL-11, LIF, MCP-1, M-CSF, MIP-1α, MIP-1β, OSM, PDGF-AA, PDGF-AB, PDGF-BB, RANTES, SLPI, TGF-β3, TNF-α, sTNF RI **Recombinant mouse:** EGF, IL-1β, IL-3, IL-4, IL-5, IL-9, MIP-1α, MIP-1β, SCF, TNF-α **Recombinant canine:** TGF-β3 **Recombinant amphibian:** TGF-β5 **Natural proteins:** bovine FGF acidic, bovine FGF basic, human PDGF, porcine TGF-β1, porcine TGF-β1.2, porcine TGF-β2 *Figure 1: R&D Systems Human Erythropoietin Quantikine IVD ELISA Kit*

D) Offeror must include all SOPs employed in ELISA testing from sample preparation through reporting of results.

Industrial Laboratories quality system requires that the laboratory has an SOP's for all routine procedures, the existence and accuracy of which are verified during every audit of our laboratory. We invite you to review these documents during in-person site visits or during videoconferencing. Excerpts of our **confidential and proprietary** procedures follow:

ELISA Kit Receipt and Management:

Reagent Receipt and Storage for Enzyme-Linked Immuno Sorbent Assay (ELISA) Test Kits

Effective Date: 5/1/12 Code Number: IL-DTS-W-005
Version Number: 1 Page 3 of 6
Area of Applicability: Drug Testing Services

1.0 PURPOSE

This work instruction (WI) describes the receipt and storage procedures for all Immunoassay kits received for drug-screening tests.

2.0 DISCUSSION

2.1 Immunoassay kits received are unpacked and assigned Primary Control Numbers (PCN) to facilitate traceablility of reagents used in drug screening. Kit lot numbers and expiration dates are compared with the manufactures Certificate of Analysis included in shipment. Packing slips are checked for accuracy, signed, dated and routed to appropriate personnel for accounts-payable purposes. Certificates of Analysis for each PCN are scanned and stored in the public drive.

2.2 It is the responsibility of the analysts at Industrial Laboratories to perform the procedures described in this work instruction before reagents are used for ELISA screening.

ELISA Analysis:

1.0 PURPOSE

This method is applicable for routine drug screening of veterinary samples, utilizing ELISA kits.

2.0 DISCUSSION

2.1 The quantity and target analyte of the ELISA assay kits used are determined by individual contract requirements and/or chosen from a rotating menu as determined by Laboratory Management.

2.2 The kits are used to determine a variety of drugs. An aliquot of diluted sample is added to antibody-coated wells and incubated at room temperature. During incubation the drug in the sample or the drug-enzyme conjugate binds to the antibody immobilized in the wells. In a positive sample, less drug-enzyme conjugate attaches to the wells since antibody-binding sites have been blocked already by the drug in the sample. After incubation the wells are drained and washed with wash-buffer solution to remove unbound sample and drug-enzyme conjugate, and then a substrate solution is added to all wells. The substrate solution will result in the formation of blue color in those wells containing drug-enzyme conjugate. The extent of color development is inversely proportional to the amount of drug in the sample or control. In other words, the absence of the drug in the sample will result in a bright blue color, whereas the presence of the drug will result in decreased or no color development. (see Attachment 1)

2.3 The test can be read visually or with a microplate reader equipped with a 650 nm filter. For screening purposes a suspect sample contains blue color with intensity less than half of the Optical Density (OD) Mean of all samples tested,or less than 2/3 of the OD mean for RactopamineThe Optical Density method of evaluation may be replaced by a visual determination by the analyst on small sample batches lacking statistical significance or other situations requiring subjective interpretation. This technique is susceptible to cross reactivity with certain types of proteins often encountered in plasma and urine samples. False positive reactions are possible; thus immunoassay is used as a screening tool only. Alcohols (methanol, isopropanol, etc.) will cause color development to fail. Do not attempt to analyze samples suspended in an alcohol solution, as the test will fail.

2.4 This method is fit-for-purpose.

Report of Test Results:

Reporting of Results for the Drug Testing Services Department

Effective Date: 12/1/14 Code Number: IL-DTS-S-003
Version Number: 3 Page 3 of 14
Area of Applicability: Drug Testing Services

1.0 PURPOSE

This standard operating procedure (SOP) applies to the reporting of analytical results generated by the Drug Testing Services (DTS) department. The purpose of this procedure is to address how analytical results are reported to clients.

2.0 DISCUSSION

2.1 The reports are released to clients within the required turn-around time. The samples in which the result was determined to be negative for medication violations are reported on the client report as "No Violation". Samples which require further testing or confirmation are reported as "Pending" on the client certificate of analysis. Upon completion of the confirmatory analysis, the samples that are confirmed positive for medication violations are reported with the exact name of the compound that was confirmed in the sample on the report. The client reports require review and signature by two people prior to releasing the reports to the clients. The client reports are usually e-mailed or faxed to the designated client contact.

E) Request for approval to pool samples for immunoassay testing including number of samples to be pooled per test, ELISA tests for which pooled sample testing is requested, and justification for pooling of samples, if applicable.

No pooling of samples will be done for any applicable ELISA testing.

2.4.8.3 Description of phenylbutazone and furosemide quantitation methods and the coefficient of variation or other estimate of measurement uncertainty for the standard method of quantitation for these analytes as used in the laboratory.

Industrial Laboratories has numerous validated methods for the quantitative determination of medications regulated by threshold. If quantitative analysis is required, it is conducted in duplicate at a minimum. The results of both analyses are averaged. The standard deviation is determined by plotting the results of control samples supplemented with the drug in question at the applicable threshold value. The standard deviation is multiplied by a factor of at least three (3) for a 99+% confidence interval. The resulting value is the measurement uncertainty value which is added to the threshold. The average sample measurement must be greater than the threshold plus the measurement uncertainty to be considered a violation.

The measurement uncertainty for phenylbutazone using current methodology is 0.35 micrograms/mL at a 99+% confidence level.

The measurement uncertainty for furosemide using current methodology is 10 nanograms/mL at a 99+% confidence level.

Both methods are LC-MS/MS based and include the use of liquid-liquid extraction under acidic conditions.

2.4.8.4 Description of screening and confirmation analysis for out of competition testing for blood doping drugs such as erythropoietin and darbepoietin.

Erythropoietin (EPO) and Darbopoietin are analyzed by immunoassay for screening analysis. We currently utilize kits from MD Bioscience and R&D Diagnostics for a two-step screening analysis, followed by LC-MS-MS for confirmation of suspects:

EPO Testing by Enyme-Linked ImmunoSorbent Assay (ELISA)

Effective Date: 2/6/17 Code Number: IL-DTS-M-056
Version Number: 1 Page 3 of 8
Area of Applicability: Drug Testing Services

1.0 PURPOSE

This method is applicable for screening of veterinary serum or plasma samples for Erythropoietin (EPO), utilizing Enzyme-Linked Immunosorbent Assay (ELISA).

2.0 DISCUSSION

2.1 Erythopoietin is a Racing Commission International (RCI) Class 1 blood-doping agent that is strictly prohibited in horse racing.

2.2 The Neogen EPO immunoassay utilizes two different antibodies specific for particular regions of the EPO molecule. One antibody is biotinylated (to bind to the streptavidin coated plate) and the other is labeled with horseradish peroxidase (HRP), an enzyme for detection.

2.3 An aliquot of sample is added to the coated well and incubated at room temperature with both antibodies. After incubation, the plate is washed to remove unbound components. The enzyme bound to the plate is incubated with substrate, tetramethylbenzidine (TMB). An acidic stopping solution is then added to stop the reaction between the enzyme and substrate, converting the color to yellow. The intensity of the yellow color is directly proportional to the concentration of EPO in the sample. Concentrations of EPO present in samples and controls can be determined from calibrators, but this test is intended as a qualitative screen.

2.4 The test can be read with a microplate reader equipped with a 450 nm filter. For screening purposes, a sample is considered suspect if the sample optical density reading exceeds the optical density reading of kit calibrator D containing approx.50 milli-International Units per milliliter of EPO. This technique is susceptible to cross reactivity with certain types of proteins often encountered in serum samples. False positive reactions are possible; thus immunoassay is used as a screening tool only. Alcohols (methanol, isopropanol, etc.) will cause color development to fail. Do not attempt to analyze samples suspended in an alcohol solution, as the test will fail. A false high reading can be obtained if excess moisture remains in the well after the wash step.

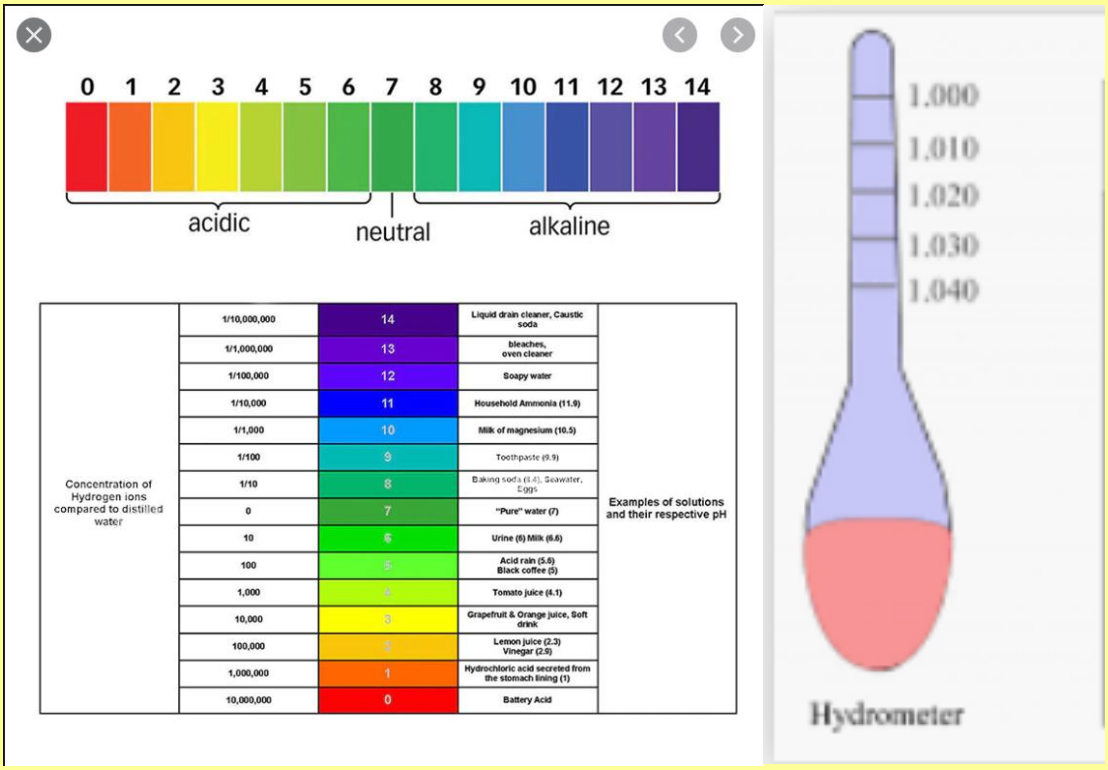
2.5 This method is fit-for-purpose.

2.4.8.5 Description of screening and confirmation analysis for zilpaterol and ractopamine.

Screening analysis for zilpaterol and ractopamine is done by LC-MS/MS on both blood, urine, and hair. ELISA kits are available for testing in urine as well and may be added as a complement to instrumental screening. Our methods are extremely sensitive for the detection of these beta-agonist drugs, as is evidenced by our record of positive findings.

2.4.8.6 Description of any other tests or testing methodologies that the laboratory proposes to employ in testing IHRC's samples.

Every urine sample submitted for confirmation tests for a medication violation shall be tested for pH and specific gravity. The pH value of the sample affect drug concentrations in the urine sample and, as such, it is an important parameter to monitor when utilizing urine-based drug thresholds. Testing will be performed using a calibrated pH electrode and pH values will be indicated on the final report. Likewise, specific gravity determinations are performed using calibrated refractometers. This parameter determines how dilute a urine sample is and can serve as supporting evidence for the presence of excess diuretic drugs. Samples with specific gravity values of 1.010 or less are re-analyzed and concurrent furosemide blood values are monitored to determine if a furosemide threshold violation is present or if non-permitted diuretics have been used. Final specific gravity readings are indicated on the report.



2.4.8.7 Detailed description of confirmatory testing methodology.

It is very important for a laboratory to ensure that violations are based on scientifically and legally sound data. Industrial Laboratories proposes to use liquid chromatography – mass spectrometry (LC/MS and/or LC/MS/MS) for confirmation of medication violations. Most confirmations will be completed using LC/MS/MS.

The confirmation method is dependent on the drug and the level of sensitivity desired or needed. Confirmatory analysis is the most important aspect of testing, as the data obtained needs to be legally defensible. Industrial Laboratories has never lost a case based on the quality of data presented at a hearing. Adherence to strict quality control measures has ensured that our data can stand up to defense challenges. Also incorporated into the laboratory's regular operations are the criteria set forth in the "*Guide for Establishing the Presence of Prohibited Substances*". This guide was adopted by consensus of all voting members of the AORC and the International Conference of Racing Authorities (ICRA). When confirming the presence of a drug by LC/MS techniques, the lab obtains two fresh aliquots of the sample (duplicate analysis) and performs an extraction procedure designed to maximize the detection capability of a particular drug in the extract.

In preparation for analysis, the instrument performance is verified by verifying the chromatographic abilities by analysis of reference materials (Test mix).

If all verification requirements are satisfied, the system is regarded as suitable for forensic analysis. All records related to equipment performance are stored and can be made available as part of a litigation packet. To verify that instruments are free of any contaminants, a solvent and/or an appropriate derivatizing agent is injected into the LC. This is to ensure that no drug is present prior to the injection of any sample. An authentic standard of the suspected drug or metabolite (derivatized, if appropriate) is injected into the instrument to establish retention time and mass spectral information of the drug under the specific conditions being used. The retention time and mass spectral data

are documented and recorded. An extract from drug-free control urine is also injected. For the analysis to be forensically sound, the extracted negative control sample as well as the reagent blanks must be negative for the drug in question. The sample extract is injected and analyzed under the same conditions as all the other samples. Positive control samples supplemented with known concentrations of the target compound are analyzed to verify the extraction and detection procedures. The use of positive control samples of known concentrations additionally allows for an estimation of the concentration of the analyte in question. The positive control sample must show the targeted drug for the analysis to be valid. A comparison of the chromatographic and mass spectral data of the drug standard, positive control, and the suspect sample is made to confirm that the spectral data and retention time information match. The drug in question is determined to be present if all confirmation criteria are met, and if the mass spectral comparison is found to be within the limits of the confirmation criteria.

The confirmation criteria utilized by Industrial Laboratories complies with the most recent recommendations set forth by the Association of Official Racing Chemists (AORC). As an aid to our mass spectral analysis, we have an extensive inventory of drug standards and controls, as well as access to administration samples. As part of our quality assurance/quality control program, upon receipt, all our reference standards are assigned control numbers and expiration dates.

Positive results undergo extensive review prior to release of test results. All data and quality criteria are verified by a certifying scientist before review by the laboratory director or designee. Management review consists of a review of chain of custody, methodology, screening results, and the overall defensibility and scientific validity of the finding. The final review also includes pulling all samples associated with the finding and verifying sample information against data, sealing the samples into evidence bags, logging the sample into positive storage records, and then placing the sample into secure, long-term storage. Only after this process has been completed is a positive final report and certificate of analysis prepared and released to the client. Positive certificates of analysis may only be signed by professional members of the Association of Official Racing Chemists (AORC).

2.4.8.8 Provide a data package used to support a chemical identification, the laboratory may delete any information in the data package that would identify the source of the sample tested.

As per the request in section 2.4.2.6, we included 2 anonymous data packets as attachments. One packet is for a finding of **ostarine**, and the other packet is for a finding of **levamisole**.

2.4.9 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM/PROFICIENCY AND BLIND SAMPLE TESTING PROGRAM

2.4.9.1 Provide a comprehensive description of the internal quality assurance/quality control program. The external, independent quality assurance program, to include proficiency samples and blind sample testing shall be scribed, and the specific entity to administer the external testing program must be identified in the Proposal and approved by the IHRC's representative.

Industrial Laboratories ensures the validity and quality of its data through strict quality protocols. To support the company's quality initiative, IL employs a Quality Assurance and Control Team consisting of Joanne Compton, Director of Quality Assurance and the lab's Quality Control Officer, Ms. Maria Bialecki. Maria is dedicated to monitoring and continuously improving quality in our company. Some of her duties include assisting the management of the drug testing laboratory with accreditation initiatives, the performance of internal audits of all areas of the laboratory, and in monitoring our internal and external quality control program. The Quality Officer also maintains the company's calibration system, which ensures that pipettes, balances and thermometers, etc., are accurate. Additionally, Maria maintains and continually monitors laboratory documentation, such as the Quality Manual and the standard operating procedure manuals.

Industrial Laboratories participates in external proficiency testing programs provided by both the AORC and the RMTC. We have superior records of performance in both programs. As per the requirements of our accreditation, we will provide the Indiana Horse Racing Commission with proficiency testing results within 2 weeks of our receipt of the final results.

We also conduct internal proficiency testing programs on an ongoing basis, and we engage in a sample exchange program with the University of Florida, which involves testing samples that have been declared negative to ensure that our screening program is optimized always. This has been a very valuable program.

More than 10% of our routine screening samples are quality assurance samples. On average, we analyze approximately **2500** individual QA samples in our screening program on an annual basis. Over the course of three years, we have analyzed well **over 8000** QA samples. The performance of each sample is tracked in a positive control log and a negative test results leads to re-analysis and a formal Corrective and Preventative Action to determine the root cause of the failure. Less than 0.1% of screening QA samples fail, and 0% have failed for undetermined causes.

Confirmation analysis contains a minimum of one positive and one negative control, and quantitative confirmations use 5-7 quantitative calibrators, consisting of matrix blanks supplemented with known amounts of reference standards, as well as blanks, and a positive control supplemented at the threshold level. Last year IL confirmed more than **800** medication violations. Quality control samples for threshold violations are monitored in control charts which are used for measurement uncertainty calculations.

All quality assurance samples are reviewed by a senior staff member immediately upon completion of the test and are tracked and monitored by the Laboratory Director and Quality Manager.

Being accredited by both A2LA and RMTC assures all our clients that we have documented quality programs in place, and a designated, qualified Quality Assurance / Quality Control Officer on staff that has the authority to execute the duties of the position.

In summary, please know that quality assurance and quality control are fundamentals of our analysis. To ensure the constant validity of our results, we employ various systems designed to minimize or eliminate potential pitfalls. Our quality systems include:

- Daily tuning and/or calibration procedures of all instrumentation. Preventative maintenance programs and/or service contracts to minimize breakdown of equipment or potential downtime. All records related to this are maintained for review. Calibration and certification of pipettes, thermometers, and other measuring equipment. Balance checks and accuracy verification. Temperature monitoring of sample refrigerators and freezers.
- The use of positive and negative matrix control samples in every analytical batch. All control samples are recorded and traceable. Failure of a positive control samples will result in rejection of the batch. The analysis will be repeated, and an investigation into the failure will be performed and documented.
- Certifying scientist review of all data generated, prior to release of any results.
- Participation in available proficiency programs, and cooperation with other laboratories to refine methodologies and reduce inter-laboratory differences, as well as the analysis of internal and external blind samples, when available. IL participates in proficiency testing programs offered by the AORC and RMTC. Proficiency testing by the AORC includes the analysis of six blind samples submitted annually. IL has a 100% success record using our instrumental screening methods for proficiency testing. The RMTC proficiency program is administered twice per year to accredited laboratories and we have participated in all proficiency rounds available to us, with a 100% pass rate.
- Re-checks of random samples for false negative results. IL engages in a negative sample exchange program with another racing laboratory to ensure the efficacy of our screening methods. By comparing results to those obtained by another laboratory's screening program we can determine if we have any gaps in drug coverage. We have engaged in this exchange for the last 4 years, and we have only had one instance when the other laboratory detected a substance that was not covered in our screen, a Class 4 drug ("Budesonide"), which has since been added to our target screen.
- Internal and External audits of laboratory operations. Internal investigation procedures. Corrective Action Procedures and Root Cause Analysis of all quality-related failures. Internal audits are performed by our quality department and are documented for review by our external auditors. Any non-compliant findings result in a Corrective and Preventative Action Report (CAPA) and require resolution within 30 days of the documented finding.
- Documentation of all quality-related systems in a company Quality Manual.
- The availability of written Standard Operating Procedures to all technical staff for training and reference. Validation of all methods used for routine analysis in a manner that is compliant with industry standards.
- The continuous training and education of our staff is documented in individual training files.
- Obtaining quality supplies from reputable vendors. Validating all reference standards used in analysis. Maintaining a documented control system for all chemicals, reagents, standards, etc., to ensure traceability of chemicals used in analysis. Certificates of Analysis and/or laboratory purity and identity confirmation for reagents and chemicals

- Limit of detection studies for individual methods.
- The maintenance of accreditation and adherence to the guidelines set forth in ISO 17025:2005 as evaluated by A2LA, RMTC, ILAC, and AORC.

The following hardcopy records relate to official samples and are available upon request:

1. Chain of Custody Form - documents individual samples, including temperature, condition of sample and packaging, integrity, seal and lock conditions, person opening the cooler or packaging and receiving samples.
2. LIMS Records – Laboratory Information Management System accessioning and tracking records that follow a sample through the testing process and sample storage areas. Records are kept of all persons handling a sample and can be printed for data packages.
3. Temperature Records - document daily temperatures of all equipment used for storage of samples.
4. Control Sample Logs - document the preparation of positive control samples, including drug identity, person preparing the control, and laboratory receipt numbers of reference materials.
5. Primary Control Number Logs - document the date of receipt for laboratory reagents and supplies, identifies person receiving supplies, storage conditions and location, expiration dates, and certificate of analysis availability.
6. Secondary Control Number Logs - document the preparation of reagents and standards, including date and person involved in the preparation, and primary control numbers of all reagents used in the preparation.

Internal Blind Analyses

Dr. Karen L'Empereur oversees our laboratory's internal blind sample program. Dr. L'Empereur prepares blind samples for both blood and urine and introduces them into the routine operations to determine the efficacy of the test and the performance of staff. Substances are chosen from a list of pre-determined compounds at relevant concentrations. This list is reviewed and updated on a yearly basis. Generally, candidate drugs are chosen based on two factors; the RCI and RMTC Controlled Therapeutic Medication list, and the TOBA "mandatory drugs". Industrial Laboratories can issue an annual report that includes a summary of blind sample analysis, results, any corrective

action reports resulting from incorrect blind sample results, as well as reports from external programs, such as negative exchange programs, AORC-EQAP and the RMTC-EQAP.

EQAP Participation

We participate in proficiency testing programs offered by both the AORC and the RMTC and our record has been superior. If awarded the contract, we agree to providing all official results from external programs within 2 weeks of receipt of finalized results at the laboratory. Please see the reports of our most recent proficiency test results in Attachment "Proficiency Results" following this proposal.

As our long standing and continuous accreditation status shows, our auditors have verified our proficiency testing results. We invite you to review all records related to our performance at our facility in Wheat Ridge, Colorado.

False Positive / False Negative Findings

Industrial Laboratories has successfully passed all proficiency tests. Our internal QC activity consists of internal blinds and daily quality control samples which have demonstrated that we have no confirmed false positives as part of this program. False negatives occur infrequently, the root cause of which have been identified as process issues, such as mis-spiking the sample with a concentration too low for routine detection in research samples. Documentation regarding our process and results are available for viewing at our facility.

Passed Sample Exchange

We currently engage in a passed sample exchange with the University of Florida (horse and greyhound samples every 6 months) as well as other jurisdictions on a random basis. This program has existed for approximately the last five years and we are only aware of one occurrence that indicated our screen missed a drug. The compound in question was budesonide, which was not targeted by our test at the time and the drug was detected by Florida in one of our samples. We immediately added the drug to our screen and have not encountered any other reports of false negatives.

2.4.9.2 Additionally, any results of external quality control samples and independent quality assurance activities over the past three (3) years must be included.

Association of Official Racing Chemists

C. Pearce, President
Fordham Ely, Cambridgeshire
United Kingdom
clive.pearce@lgcgroup.com

J. Scarth, Sec-Tres
Fordham Ely, Cambridgeshire
United Kingdom
James.scarth@lgcgroup.com

D. Batty. President Elect
Flemington, Victoria
Australia
dbatty@rasl.com.au

A. Wong, Non *Ex Officio*
Hong Kong
China
april.sy.wong-rl@hkjc.org.hk

L. Bailly-Chouriberry, VP
Verrieres Le Buisson
France
l.bailly@lchfrance.fr

P.Hartman, Non *Ex Officio*
Wheat Ridge, CO
United States
petra@industriallabs.net

D. Hill, Executive Director
1021 Storrs Rd
Storrs, Connecticut 06268 USA
Voice: 860-487-3755
dwhill.aorc@charter.net

22nd July 2019

Petra Hartmann
Industrial Laboratories Co., Inc.
Colorado
USA

Dear Petra,

Thank you for participating in the 2019 AORC Proficiency Testing Program.

Your laboratory's score for the urine program was 100%.
The drugs and concentrations for the urine program were:

Sample 1 – Dermorphin 15ng/mL
Sample 2 – O-desmethyl Venlafaxine 10ng/mL
Sample 3 – Nalorphine 30ng/mL
Sample 4 – Phenobarbital 60ng/mL
Sample 5 – Flunixin 120ng/mL
Sample 6 – Hydromorphone 5ng/mL

Your laboratory's score for the plasma program was 100%
The drugs and concentrations for the plasma program were:

Sample A – Methylprednisolone 0.5ng/mL/Dexamethasone 0.5ng/mL
Sample B – Blank sample
Sample C – Testosterone 1ng/mL/Acepromazine 2ng/mL/Flufenamic acid 15ng/mL

The AORC will supply a certificate for this performance in due course.

Regards,

David Batty
PT Committee Chairman

Association of Official Racing Chemists

C. Pearce, President
Fordham Ely, Cambridgeshire
United Kingdom
clive.pearce@lgcgroup.com

C. Russo, Past President
Bentley DC, WA
Australia
crusso@chemcentre.wa.gov.au

L. Bailly-Chouriberry, VP
Vecteurs Le Buisson
France
l.bailly@ichfrance.fr

B. Baudot, Seo-Tres
Port Louis
Mauritius
bertrand.baudot@quantilab.mu

A. Wong, Non *Ex Officio*
Hong Kong
China
april.sy.wong-rl@hkjc.org.hk

P. Hoobler, Non *Ex Officio*
Wheat Ridge, CO
United States
petra@industrialiabs.net

D. Hill, Executive Director
1021 Storrs Rd
Storrs, Connecticut 06268
USA; Voice: 860-487-3755
dwhill.aorc@charter.net

18th July 2018

Petra Hartmann
Industrial Laboratories Co., Inc.
Colorado
USA

Dear Petra,

Thank you for participating in the 2018 AORC Proficiency Testing Program.

Your laboratory's score for the urine program was 83% (Pass).
The drugs and concentrations for the urine program were:

Sample 1 – 3-Hydroxy detomidine 10ng/mL
Sample 2 – Fludrocortisone 15ng/mL
Sample 3 – Ephedrine 25ng/mL/Oxymorphone 5ng/mL
Sample 4 – Bumetanide 25ng/mL
Sample 5 – Firocoxib 25ng/mL
Sample 6 – Blank sample

Your laboratory's score for the plasma program was 100%
The drugs and concentrations for the plasma program were:

Sample A – Lignocaine 2ng/mL/Pentazocine 2ng/mL
Sample B – Sildenafil 2ng/mL/Flumethasone 2ng/mL/Chlorpromazine 2ng/mL

The AORC will supply a certificate for this performance in due course.

Regards,

David Batty
PT Committee Chairman

Sample Details

Samples were despatched: 11 November 2019

Reporting Deadline Date: 16 December 2019

The following samples were despatched in **Round 010**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration	Unit
1	Equine urine	Blank	Blank	
2	Equine urine	6-methoxy-napthyl acetic acid	52.8	ng/ml (µg/L)
3	Equine urine	Benzoylecgonine	35.4	ng/ml (µg/L)
4	Equine urine	Butorphanol	461.1	ng/ml (µg/L)
5	Equine urine	Oxymorphone	4.7	ng/ml (µg/L)
6	Equine plasma	Meclofenamic acid	158.8	ng/ml (µg/L)
7	Equine plasma	Etodolac	40.6	ng/ml (µg/L)
8	Equine plasma	Blank	Blank	
9	Equine plasma	5-OH dantrolene	230.3	pg/ml (ng/L)
10	Equine plasma	Testosterone	45.6	pg/ml (ng/L)
11	Blank Plasma			
12	Blank Urine			

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
1 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
2 - Drug Identification	Result	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	6-methyl-naphthyl acetic acid	9	33.3%	66.7%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
3 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Benzoylecgonine	Benzoylecgonine	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
4 - Drug Identification	Drug 1	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Total butorphanol	Total butorphanol	9	100.0%	0.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)
4 - Drug Identification	Drug 2	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected		5	0.0%	80.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine urine

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
5 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Oxymorphone	Oxymorphone	9	66.7%	33.3%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
6 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Meclofenamic acid	Meclofenamic acid	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
7 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Etodolac	Etodolac	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Unsatisfactory %	Your Reference
8 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	77.8%	22.2%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Result Field	Analyst	Method	Result	Assigned Value	Number of results	Satisfactory %	Your Reference
9 - Drug Identification	Result	MD	No enzyme hydrolysis then LC/MS (LC/MS/MS)	5-OH dantrolene	5-OH dantrolene	9	100.0%	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Equine plasma

Analyte	Analyst	Method	Result	Units	Z Score	Assigned Value	Ux AV	SDPA	Exp.SDPA	Number of results	Median	Mean	Robust SD	SD	Your Reference
10 - Testosterone	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	41.85	pg/ml	0.65	37.03	1.93	7.41	N/A	9	37.03	35.34	4.642	6.054	No enzyme hydrolysis then LC/MS (LC/MS/MS)

Scheme: Racing Medication and Testing Consortium **Round: 9**

Sample Details

The following samples were despatched in **Round 009**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration	Unit
1	Equine urine	Formoterol	22.6	ng/ml (µg/L)
2	Equine urine	Nalorphine	46.2	ng/ml (µg/L)
3	Equine urine	Theophylline	56.7	ng/ml (µg/L)
4	Equine urine	Apomorphine	55.7	ng/ml (µg/L)
5	Equine urine	Boldenone	41.0	ng/ml (µg/L)
6	Equine plasma	Phenylbutazone	4773 (4.7 mg/L)	ng/ml (µg/L)
7	Equine plasma	Blank	Blank	
8	Equine plasma	Stanozolol	5.5	ng/ml (µg/L)
9	Equine plasma	Prednisolone	5.7	ng/ml (µg/L)
10	Equine plasma	Detomidine	9.1	ng/ml (µg/L)
11	Blank Plasma			
12	Blank Urine			

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
1 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Formoterol	Formoterol	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
2 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Nalorphine	Nalorphine	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
3 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Theophylline	Theophylline	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
4 - Drug Identification	Drug 1	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Apomorphine	Apomorphine	9	100.0
4 - Drug Identification	Drug 2	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
5 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Boldenone	Boldenone	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
6 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Phenylbutazone	Phenylbutazone	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
7 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
8 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Stanozolol	Stanozolol	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
9 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Prednisolone	Prednisolone	9	88.9

Equine plasma

Analyte	Analyst	Method	Result	Ux	Units	z score (** z' score)	Assigned Value	Ux AV	SDPA	Exp. SDPA	No of results	Median	Mean	Robust SD	SD
10 - Detomidine	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	10.25	0.08	ng/ml	-0.15 **	10.44	0.73	1.060	1.287	9	10.44	10.17	1.654	1.414

** Please note, participant performance for this analyte has been assessed using a z' score, rather than a z score, in order to account for the measurement uncertainty of the assigned value which is not negligible when compared to the SDPA.

Scheme: Racing Medication and Testing Consortium **Round: 8**

Sample Details

Samples were despatched on: **12 November 2018**

The following samples were despatched in **Round 008**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration	Unit
1	Equine urine	Gabapentin	88.3	ng/ml (µg/L)
2	Equine urine	Ritalinic acid	41.24	ng/ml (µg/L)
3	Equine urine	BLANK		
4	Equine urine	Benzoylecgonine	46.13	ng/ml (µg/L)
5	Equine urine	Carboxydetomidine	5.86	ng/ml (µg/L)
6	Equine plasma	Flufenamic acid	47.70	ng/ml (µg/L)
7	Equine plasma	Nandrolone	59.20	pg/ml (ng/L)
8	Equine plasma	3OH-lidocaine	58.20	pg/ml (ng/L)
9	Equine plasma	Naproxen	1718.42	ng/ml (µg/L)
10	Equine plasma	Dexamethasone	9.80	pg/ml (ng/L)
11	Blank Plasma			
12	Blank Urine			

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
1 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Gabapentin	Gabapentin	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
2 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Ritalinic acid	Ritalinic acid	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
3 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
4 - Drug Identification	Drug 1	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Benzoylecgonine	Benzoylecgonine	9	100.0
4 - Drug Identification	Drug 2	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
5 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Carboxydetomidine	Carboxydetomidine	9	55.6

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
6 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Flufenamic acid	Flufenamic acid ; DMSO	9	100.0

Scheme: Racing Medication and Testing Consortium

Round: 8

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
7 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Nandrolone	Nandrolone	9	66.7

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
8 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	3OH-lidocaine	3OH-lidocaine	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
9 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Naproxen	Naproxen	9	100.0

Equine plasma

Analyte	Analyst	Method	Result	Ux	Units	z score (** z' score)	Assigned Value	Ux AV	SDPA	Exp. SDPA	No of results	Median	Mean	Robust SD	SD
10 - Dexamethasone	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	11.05	2.23	pg/ml	0.36	10.30	0.56	2.060	N/A	9	10.30	10.48	1.335	2.390

** Please note, participant performance for this analyte has been assessed using a z' score, rather than a z score, in order to account for the measurement uncertainty of the assigned value which is not negligible when compared to the SDPA.

Scheme: Racing Medication and Testing Consortium

Round: 7

Sample Details

The following samples were despatched in **Round 007**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration	Unit
1	Equine urine	Nalbuphine	51.20	ng/ml (µg/L)
2	Equine urine	Carboxydetomidine	9.27	ng/ml (µg/L)
3	Equine urine	Mephentermine	19.75	ng/ml (µg/L)
4	Equine urine	Methyltestosterone	8.14	ng/ml (µg/L)
5	Equine urine	Amphetamine	70.62	ng/ml (µg/L)
6	Equine plasma	Procaine	39.77	ng/ml (µg/L)
7	Equine plasma	Clenbuterol	8.18	pg/ml (ng/L)
8	Equine plasma	Deracoxib	35.38	ng/ml (µg/L)
9	Equine plasma	BLANK	-	
10	Equine plasma	Ketoprofen	3.49	ng/ml (µg/L)
11	Blank Plasma			
12	Blank Urine			

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
1 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Nalbuphine	Nalbuphine	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
2 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Carboxydetomidine	Carboxydetomidine	9	88.9

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
3 - Drug Identification	Result	Lab Result	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Mephentermine	Mephentermine	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
4 - Drug Identification	Drug 1	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Methyltestosterone	Methyltestosterone	9	100.0
4 - Drug Identification	Drug 2	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
5 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Amphetamine	Amphetamine	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
6 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	Not Assessed	9	0.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
7 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Clenbuterol	Clenbuterol	9	88.9

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
8 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Deracoxib	Deracoxib; DMSO	10	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
9 - Drug Identification	Result	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	88.9

Equine plasma

Analyte	Analyst	Method	Result	Ux	Units	z score (** z' score)	Assigned Value	Ux AV	SDPA	Exp. SDPA	No of results	Median	Mean	Robust SD	SD
10 - Ketoprofen	Lab Result	No enzyme hydrolysis then LC/MS (LC/MS/MS)	3.80	0.3	ng/mL	0.47 **	3.60	0.23	0.360	0.427	9	3.60	3.40	0.564	0.639

** Please note, participant performance for this analyte has been assessed using a z' score, rather than a z score, in order to account for the measurement uncertainty of the assigned value which is not negligible when compared to the SDPA.

Scheme: Racing Medication and Testing Consortium **Round: 6**

Sample Details

The following samples were despatched in **Round 006**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration
1	Equine urine	Tetrahydrogestrinone	3.44 µg/L
2	Equine urine	Ipratropium	3.34 µg/L
3	Equine urine	Pentazocine	27.62 µg/L
4	Equine urine	Modafinil	34.73 µg/L
		Modafinil acid	33.43 µg/L
5	Equine urine	Guanabenz	19.13 µg/L
6	Equine plasma	Ketorolac	32.46 µg/L
7	Equine plasma	Fenoprofen	37.93 µg/L
8	Equine plasma	Dexamethasone	12.81 ng/L
9	Equine plasma	Caffeine	141.11 µg/L
10	Equine plasma	Flunixin	27.68 µg/L
11	Blank Plasma		
12	Blank Urine		

Scheme: Racing Medication and Testing Consortium **Round: 6**

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
1 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Tetrahydrogestrinone	Tetrahydrogestrinone	10	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
2 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Ipratroplum	Ipratroplum	10	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
3 - Drug Identification	Result	TK	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Pentazocine	Pentazocine	10	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
4 - Drug Identification	Drug 1	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Modafinil	Modafinil	10	100.0
4 - Drug Identification	Drug 2	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Modafinil acid	Modafinil acid	10	80.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
5 - Drug Identification	Result	TK	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Guanabenz	Guanabenz	10	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
6 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Ketorolac	Ketorolac	10	100.0

Scheme: Racing Medication and Testing Consortium

Round: 6

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
7 - Drug Identification	Result	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Fenoprofen	Fenoprofen	10	90.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
8 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Dexamethasone	Dexamethasone	10	70.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
9 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Caffeine	Caffeine	10	100.0

Equine plasma

Analyte	Analyst	Method	Result	Ux	Units	z score (** z' score)	Assigned Value	Ux AV	SDPA	Exp. SDPA	No of results	Median	Mean	Robust SD	SD
10 - Flunixin	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	26.00	3.1	ng/ml	0.00	26.01	N/A	2.601	N/A	10	26.01	26.87	2.158	2.290

** Please note, participant performance for this analyte has been assessed using a z' score, rather than a z score, in order to account for the measurement uncertainty of the assigned value which is not negligible when compared to the SDPA.

Scheme: Racing Medication and Testing Consortium

Round: 5

Sample Details

Samples were despatched on: **18 April 2017**

The following samples were despatched in **Round 005**:

The following lyophilised samples were distributed:

Sample	Matrix	Analyte	Concentration
1	Equine urine	Clenbuterol	285 ng/L (pg/ml)
2	Equine urine	Bumetanide	45 µg/L (ng/ml)
3	Equine urine	HEPS	22 µg/L (ng/ml)
4	Equine urine	Metaproterenol	34 µg/L (ng/ml)
5	Equine plasma	Flurbiprofen	43 µg/L (ng/ml)
6	Equine plasma	Glycopyrrolate	14 ng/L (pg/ml)
7	Equine plasma	Blank	-
8	Equine plasma	Tenoxicam	32 µg/L (ng/ml)
9	Equine plasma	Meclofenamic acid	192 µg/L (ng/ml)
10	Equine urine	3-OH-Mepivacaine	16.7 µg/L (ng/ml)

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
1 - Drug Identification	Result	AS	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Clenbuterol	Clenbuterol	9	100.0
1 - Drug Identification	Result	MO	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Clenbuterol	Clenbuterol	9	100.0
1 - Drug Identification	Result	NH	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Clenbuterol	Clenbuterol	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
2 - Drug Identification	Result	TK	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Bumetanide	Bumetanide	9	100.0
2 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Bumetanide	Bumetanide	9	100.0
2 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Bumetanide	Bumetanide	9	100.0

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
3 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	2-(1-hydroxypropyl)-promazine sulphoxide	HEPS	9	88.9
3 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	2-(1-hydroxypropyl)-promazine sulphoxide	HEPS	9	88.9
3 - Drug Identification	Result	TK	No enzyme hydrolysis then LC/MS (LC/MS/MS)	2-(1-hydroxypropyl)-promazine sulphoxide	HEPS	9	88.9

Equine urine

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
4 - Drug Identification	Result	AS	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Metaproterenol	Not Assessed	9	0.0
4 - Drug Identification	Result	NH	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Metaproterenol	Not Assessed	9	0.0
4 - Drug Identification	Result	TK	Enzyme hydrolysis then LC/MS (LC/MS/MS)	Metaproterenol	Not Assessed	9	0.0

Scheme: Racing Medication and Testing Consortium

Round: 5

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
5 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Flurbiprofen	Flurbiprofen	9	100.0
5 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Flurbiprofen	Flurbiprofen	9	100.0
5 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Flurbiprofen	Flurbiprofen	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
6 - Drug Identification	Result	MO	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Glycopyrrolate	Glycopyrrolate	9	88.9
6 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Glycopyrrolate	Glycopyrrolate	9	88.9
6 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Glycopyrrolate	Glycopyrrolate	9	88.9

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
7 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0
7 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	No substance detected	No substance detected	9	100.0

Equine plasma

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
8 - Drug Identification	Result	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Tenoxicam	Tenoxicam	9	100.0
8 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Tenoxicam	Tenoxicam	9	100.0
8 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Tenoxicam	Tenoxicam	9	100.0

Equine plasma

Scheme: Racing Medication and Testing Consortium

Round: 5

Analyte	Test	Analyst	Method	Result	Assigned Value	No of results	Satisfactory %
9 - Drug Identification	Result	SC	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Meclofenamic acid	Meclofenamic acid	9	100.0
9 - Drug Identification	Result	AS	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Meclofenamic acid	Meclofenamic acid	9	100.0
9 - Drug Identification	Result	NH	No enzyme hydrolysis then LC/MS (LC/MS/MS)	Meclofenamic acid	Meclofenamic acid	9	100.0

Equine urine

Analyte	Analyst	Method	Result	Ux	Units	z score (** z' score)	Assigned Value	Ux AV	SDPA	Exp.SDPA	No of results	Median	Mean	Robust SD	SD
10 - 3-OH-Mepivacaine	AS	Enzyme hydrolysis then LC/MS (LC/MS/MS)	18.5	0.8	ng/ml	0.28 **	17.9	1.2	1.79	2.16	2	16.7	16.7	2.67	2.55
10 - 3-OH-Mepivacaine	NH	Enzyme hydrolysis then LC/MS (LC/MS/MS)	18.5	0.8	ng/ml	0.28 **	17.9	1.2	1.79	2.16	2	16.7	16.7	2.67	2.55
10 - 3-OH-Mepivacaine	TK	Enzyme hydrolysis then LC/MS (LC/MS/MS)	18.5	0.8	ng/ml	0.28 **	17.9	1.2	1.79	2.16	2	16.7	16.7	2.67	2.55

** Please note, participant performance for this analyte has been assessed using a z' score, rather than a z score, in order to account for the measurement uncertainty of the assigned value which is not negligible when compared to the SDPA.

2.4.9.3 Provide the total number of internal and external quality control (QC) samples (positive controls and blind samples) analyzed over each of the previous three (3) years along with total number of samples

analyzed, categorized as urine, blood (serum or plasma) samples. QC samples for phenylbutazone, flunixin, and furosemide quantitation in serum or plasma should be itemized separately.

Sample #	Compound	Targeted Amount (ng/mL)	Compound Reported
U-001	Atenolol	50.0	No violation reported
U-003	Ractopamine	10.0	Ractopamine; no estimated value reported
U-004	Ritalinic Acid	20.0	Ritalinic Acid
U-005	Gabapentin	100	Gabapentin
U-006	Blank	NA	No violation reported
U-007	Clenbuterol	0.200	Clenbuterol
U-009	3-OH Lidocaine	2.00	3-OH Lidocaine
U-010	Valerenic acid	1000	Valerenic acid
U-013	Zilpaterol	25.0	Zilpaterol
U-015	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-016	Nordiazepam	40.0	Nordiazepam
U-018	Salbutamol (Albuterol)	10.0	Salbutamol (Albuterol); Also reported clenbuterol
U-019	Procaine	50.0	Procaine
U-022	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-023	HEPS (Acepromazine metab)	20.0	HEPS
U-028	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-029	Gabapentin	100	Gabapentin
U-030	HEPS (Acepromazine metab)	20.0	HEPS
U-031	Clenbuterol	0.200	Clenbuterol
U-032	Procaine	50.0	Procaine; no estimated value reported
U-033	Zilpaterol	25.0	Zilpaterol
U-034	Ritalinic Acid	20.0	Ritalinic Acid
U-035	3-OH Lidocaine	2.00	3-OH Lidocaine
U-036	Blank	NA	No violation reported
U-040	Salbutamol (Albuterol)	10.0	Procaine 29.9 ng/mL
U-041	Valerenic acid	1000	Valerenic acid
U-044	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-049	Ractopamine	10.0	Ractopamine
U-051	Nordiazepam	40.0	Nordiazepam
U-053	Atenolol	50.0	Atenolol
U-056	Procaine	50.0	Procaine
U-059	Salbutamol (Albuterol)	10.0	Albuterol
U-061	3-OH Lidocaine	2.00	3-OH Lidocaine
U-062	Valerenic acid	1000	Valerenic acid
U-063	Ritalinic Acid	20.0	Ritalinic Acid
U-065	HEPS (Acepromazine metab)	20.0	HEPS
U-067	Nordiazepam	40.0	Nordiazepam
U-069	Blank	NA	No violation reported

U-070	Zilpaterol	25.0	Zilpaterol
U-071	Clenbuterol	0.200	Clenbuterol
U-072	Ractopamine	10.0	Ractopamine
U-073	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-075	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-078	Gabapentin	100	Gabapentin
U-079	Procaine	50.0	Procaine
U-083	HEPS (Acepromazine metab)	20.0	No violation reported
U-084	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-085	Salbutamol (Albuterol)	10.0	Albuterol
U-086	Zilpaterol	25.0	Zilpaterol
U-087	Clenbuterol	0.200	Clenbuterol
U-089	3-OH Lidocaine	2.00	3-OH Lidocaine
U-090	Valerenic acid	1000	Valerenic acid
U-091	Nordiazepam	40.0	Nordiazepam
U-092	Atenolol	50.0	Atenolol
U-094	Ritalinic Acid	20.0	Ritalinic Acid
U-097	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-099	Blank	NA	No violation reported
U-100	Gabapentin	100	Gabapentin
U-104	Ractopamine	10.0	Ractopamine
U-105	Blank	NA	No violation reported
U-106	Clenbuterol	0.200	Clenbuterol
U-110	Ractopamine	10.0	Ractopamine
U-115	Zilpaterol	25.0	Zilpaterol
U-119	3-OH Lidocaine	2.00	3-OH Lidocaine
U-120	Gabapentin	100	Gabapentin
U-121	Salbutamol (Albuterol)	10.0	Albuterol
U-122	Valerenic acid	1000	Valerenic acid
U-123	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-124	Procaine	50.0	No violation reported
U-125	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-126	Nordiazepam	40.0	Nordiazepam
U-128	Ritalinic Acid	20.0	Ritalinic Acid
U-129	HEPS (Acepromazine metab)	20.0	HEPS
U-131	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-132	Salbutamol (Albuterol)	10.0	Albuterol
U-133	Ritalinic Acid	20.0	Ritalinic Acid
U-135	Clenbuterol	0.200	Clenbuterol
U-136	Blank	NA	No violation reported
U-138	3-OH Lidocaine	2.00	3-OH Lidocaine
U-139	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-140	Valerenic acid	1000	Valerenic acid
U-141	Zilpaterol	25.0	Zilpaterol
U-146	Gabapentin	100	Gabapentin
U-150	Procaine	50.0	Procaine
U-151	HEPS (Acepromazine metab)	20.0	HEPS

U-155	Nordiazepam	40.0	Nordiazepam
U-156	Ractopamine	10.0	Ractopamine
U-158	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-159	Gabapentin	100	Gabapentin; no estimated value reported
U-161	HEPS (Acepromazine metab)	20.0	HEPS
U-162	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-163	Zilpaterol	25.0	Zilpaterol
U-165	3-OH Lidocaine	2.00	3-OH Lidocaine
U-166	Procaine	50.0	Procaine
U-168	Nordiazepam	40.0	Nordiazepam
U-169	Valerenic acid	1000	Valerenic acid;
U-173	Clenbuterol	0.200	Clenbuterol
U-175	Blank	NA	No violation reported
U-176	Ritalinic Acid	20.0	Ritalinic Acid
U-180	Ractopamine	10.0	Ractopamine
U-181	Salbutamol (Albuterol)	10.0	Albuterol
U-183	Ritalinic Acid	20.0	Ritalinic Acid
U-184	3-OH Lidocaine	2.00	3-OH Lidocaine
U-185	HEPS (Acepromazine metab)	20.0	HEPS
U-188	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-190	Nordiazepam	40.0	Nordiazepam
U-191	Valerenic acid	1000	Valerenic acid
U-192	Ractopamine	10.0	Ractopamine
U-193	Blank	NA	No violation reported
U-196	Zilpaterol	25.0	Zilpaterol
U-198	Salbutamol (Albuterol)	10.0	Albuterol
U-200	Procaine	50.0	Procaine
U-203	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil; no estimated value reported
U-204	Clenbuterol	0.200	Clenbuterol
U-207	Gabapentin	100	Gabapentin
U-210	Ractopamine	10.0	Ractopamine
U-211	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-214	Ritalinic Acid	20.0	Ritalinic Acid
U-215	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-216	Gabapentin	100	Gabapentin
U-219	HEPS (Acepromazine metab)	20.0	HEPS
U-220	Clenbuterol	0.200	Clenbuterol
U-223	Zilpaterol	25.0	Zilpaterol
U-224	3-OH Lidocaine	2.00	3-OH Lidocaine
U-225	Valerenic acid	1000	Valerenic Acid
U-226	Salbutamol (Albuterol)	10.0	Albuterol
U-229	Nordiazepam	40.0	Nordiazepam
U-231	Procaine	50.0	Procaine
U-233	Blank	NA	No violation reported
U-235	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-236	3-OH Lidocaine	2.00	3-OH Lidocaine

U-239	Blank	NA	No violation reported
U-244	Clenbuterol	0.200	Clenbuterol
U-245	Zilpaterol	25.0	Zilpaterol
U-248	HEPS (Acepromazine metab)	20.0	HEPS
U-250	Gabapentin	100	Gabapentin
U-251	Nordiazepam	40.0	No violation reported
U-251 repeat	Nordiazepam	40.0	Nordiazepam
U-252	Salbutamol (Albuterol)	10.0	Albuterol
U-253	Ritalinic Acid	20.0	Ritalinic Acid
U-254	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-255	Valerenic acid	1000	Valerenic Acid
U-257	Procaine	50.0	Procaine
U-258	Ractopamine	10.0	Ractopamine
U-261	Clenbuterol	0.200	Clenbuterol
U-263	HEPS (Acepromazine metab)	20.0	HEPS
U-264	Zilpaterol	25.0	Zilpaterol
U-265	Ractopamine	10.0	Ractopamine
U-267	Procaine	50.0	Procaine
U-268	Gabapentin	100	Gabapentin
U-270	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-273	Blank	NA	No violation reported
U-277	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-278	3-OH Lidocaine	2.00	3-OH Lidocaine
U-279	Valerenic acid	1000	Valerenic Acid
U-280	Nordiazepam	40.0	Nordiazepam
U-282	Ritalinic Acid	20.0	Ritalinic Acid
U-285	Salbutamol (Albuterol)	10.0	Albuterol
U-287	Zilpaterol	25.0	Zilpaterol
U-290	Blank	NA	No violation reported
U-292	Procaine	50.0	Procaine
U-294	Ritalinic Acid	20.0	Ritalinic Acid
U-297	Ractopamine	10.0	Ractopamine
U-300	Nordiazepam	40.0	Nordiazepam
U-301	Salbutamol (Albuterol)	10.0	Albuterol
U-302	3-OH Lidocaine	2.00	3-OH Lidocaine
U-303	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-305	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-306	Clenbuterol	0.200	Clenbuterol
U-308	Gabapentin	100	Gabapentin
U-310	HEPS (Acepromazine metab)	20.0	HEPS
U-312	Valerenic acid	1000	Valerenic Acid
U-314	3-OH Lidocaine	2.00	3-OH Lidocaine
U-315	Zilpaterol	25.0	Zilpaterol
U-317	Ractopamine	10.0	Ractopamine
U-318	Salbutamol (Albuterol)	10.0	Albuterol
U-319	Ritalinic Acid	20.0	Ritalinic Acid

U-320	Clenbuterol	0.200	Clenbuterol
U-321	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-322	Gabapentin	100	Gabapentin
U-323	HEPS (Acepromazine metab)	20.0	HEPS
U-324	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-330	Procaine	50.0	Procaine
U-333	Valerenic acid	1000	Valerenic Acid
U-334	Nordiazepam	40.0	Nordiazepam
U-336	Blank	NA	71 ng/mL atenolol reported
U-336 repeat	Blank	NA	69 ng/mL Atenolol
U-339	3-OH Lidocaine	2.00	3-OH Lidocaine
U-341	Procaine	50.0	Procaine
U-342	Ractopamine	10.0	Ractopamine
U-347	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-348	Clenbuterol	0.200	Clenbuterol
U-349	Valerenic acid	1000	Valerenic Acid
U-350	Blank	NA	Bupivacaine (117 pg/mL)
U-352	Zilpaterol	25.0	Zilpaterol
U-354	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol; no estimated value reported
U-355	Nordiazepam	40.0	Nordiazepam
U-356	Gabapentin	100	Gabapentin
U-357	Ritalinic Acid	20.0	No violation reported
U-358	HEPS (Acepromazine metab)	20.0	HEPS
U-361	Salbutamol (Albuterol)	10.0	Albuterol
U-365	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol Also reported atenolol at 6.1 ng/mL
U-366	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-367	Clenbuterol	0.200	Clenbuterol
U-368	Nordiazepam	40.0	Nordiazepam
U-373	Salbutamol (Albuterol)	10.0	0.404 ng/mL Clenbuterol
U-373 repeat	Salbutamol (Albuterol)	10.0	Albuterol
U-374	HEPS (Acepromazine metab)	20.0	HEPS
U-375	Zilpaterol	25.0	Zilpaterol
U-376	Ritalinic Acid	20.0	Ritalinic Acid
U-377	Gabapentin	100	Gabapentin
U-380	3-OH Lidocaine	2.00	3 OH Lidocaine
U-381	Blank	NA	61.1 ng/mL Atenolol
U-381 Repeat	Blank	NA	64 ng/mL Atenolol
U-383	Atenolol	50.0	Atenolol
U-386	Ractopamine	10.0	Ractopamine
U-387	Valerenic acid	1000	Valerenic Acid
U-388	Procaine	50.0	Procaine
U-391	Procaine	50.0	Procaine
U-392	Zilpaterol	25.0	Zilpaterol
U-393	Ritalinic Acid	20.0	Ritalinic Acid

U-394	3-OH Lidocaine	2.00	3 OH Lidocaine
U-395	Atenolol	50.0	Atenolol
U-397	Nordiazepam	40.0	Nordiazepam
U-398	Gabapentin	100	Gabapentin
U-399	Blank	NA	No violation reported
U-402	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-408	Salbutamol (Albuterol)	10.0	Albuterol
U-409	Valerenic acid	1000	Valerenic Acid
U-410	HEPS (Acepromazine metab)	20.0	HEPS
U-411	Ractopamine	10.0	Ractopamine
U-412	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-416	Clenbuterol	0.200	Clenbuterol
U-418	Blank	NA	No violation reported
U-419	Salbutamol (Albuterol)	10.0	Albuterol
U-420	Procaine	50.0	Procaine
U-422	Ractopamine	10.0	Ractopamine
U-423	Gabapentin	100	Gabapentin
U-424	Valerenic acid	1000	Valerenic acid
U-425	Nordiazepam	40.0	Nordiazepam
U-427	Zilpaterol	25.0	Zilpaterol
U-428	Clenbuterol	0.200	Clenbuterol
U-430	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-431	Ritalinic Acid	20.0	Ritalinic Acid
U-432	HEPS (Acepromazine metab)	20.0	HEPS
U-437	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-442	3-OH Lidocaine	2.00	3-OH Lidocaine
U-444	3-OH Lidocaine	2.00	3-OH Lidocaine
U-445	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-446	HEPS (Acepromazine metab)	20.0	HEPS
U-450	Nordiazepam	40.0	Nordiazepam
U-452	Atenolol	50.0	Atenolol
U-454	Salbutamol (Albuterol)	10.0	Albuterol
U-455	Zilpaterol	25.0	Zilpaterol
U-457	Ritalinic Acid	20.0	Ritalinic Acid
U-458	Procaine	50.0	Procaine
U-459	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-461	Ractopamine	10.0	Ractopamine
U-462	Blank	NA	No violation reported
U-463	Gabapentin	100	Gabapentin
U-466	Clenbuterol	0.200	Clenbuterol
U-467	Valerenic acid	1000	Valerenic acid
U-469	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-473	HEPS (Acepromazine metab)	20.0	HEPS
U-474	Zilpaterol	25.0	Zilpaterol
U-475	Valerenic acid	1000	Valerenic Acid
U-476	Procaine	50.0	Procaine
U-478	Ritalinic Acid	20.0	Ritalinic Acid

U-479	Gabapentin	100	Gabapentin
U-480	Clenbuterol	0.200	Clenbuterol
U-483	Atenolol	50.0	Atenolol
U-485	Salbutamol (Albuterol)	10.0	Albuterol
U-488	Nordiazepam	40.0	Nordiazepam
U-489	Blank	NA	No violation reported
U-490	3-OH Lidocaine	10.0	3-OH Lidocaine
U-491	Ractopamine	10.0	Ractopamine
U-492	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-495	Valerenic acid	1000	Valerenic acid
U-498	Atenolol	50.0	Atenolol
U-499	3-OH Lidocaine	10.0	3-OH Lidocaine; also reported 4-OH Xylaxine 1.5 ng/mL
U-500	Ractopamine	10.0	Ractopamine
U-505	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil
U-506	Clenbuterol	0.200	Clenbuterol
U-508	Nordiazepam	40.0	Nordiazepam
U-510	Zilpaterol	25.0	Zilpaterol
U-511	Salbutamol (Albuterol)	10.0	Albuterol
U-512	Gabapentin	100	Gabapentin
U-513	Atenolol	50.0	Atenolol
U-514	Procaine	50.0	Procaine
U-515	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-516	HEPS (Acepromazine metab)	20.0	HEPS
U-518	Ritalinic Acid	20.0	Ritalinic Acid
U-519	Ractopamine	10.0	Ractopamine
U-520	Nordiazepam	40.0	Nordiazepam
U-521	Salbutamol (Albuterol)	10.0	Albuterol
U-522	Zilpaterol	25.0	Zilpaterol
U-523	O-Desmethyl cis-Tramadol	40.0	O-Desmethyl cis-Tramadol
U-524	Atenolol	50.0	Atenolol
U-525	Clenbuterol	0.500	Clenbuterol
U-526	Procaine	50.0	Procaine
U-527	N-Desmethyl Sildenafil	5.00	N-Desmethyl Sildenafil; no estimated value reported
U-528	Gabapentin	100	Gabapentin
U-529	Blank	NA	No violation reported
U-530	Valerenic acid	1000	Valerenic acid
U-531	HEPS	20.0	HEPS
U-532	Ritalinic Acid	20.0	Ritalinic Acid
U-533	3-OH Lidocaine	10.0	3-OH Lidocaine
U-534	Salbutamol (Albuterol)	10.0	Albuterol
U-535	Procaine	50.0	Procaine
U-536	HEPS	20.0	HEPS
U-537	3-OH Lidocaine	10.0	3-OH Lidocaine
U-538	Nordiazepam	40.0	Nordiazepam
U-539	Blank	NA	No violation reported

2.4.9.4 Provide a description of corrective action taken if any of the internal and external quality control (QC) samples resulted in failed analysis.

RMTC Round **10**: Corrective Action was not needed, as the drug candidate in question was eliminated from the test round due to reference material discrepancies originating with the proficiency testing provider.
RMTC Round **5**: The erroneous report was due to a transcription error made by our Director of QA/QC. The lab detected the correct drug (2-1-hydroxyethylpromazine sulfoxide) but when the Director of QA/QC entered the test result she mistakenly selected (2-1-hydroxypropylpromazine sulfoxide) from the drop-down menu. As part of the corrective action, the proficiency reporting duty was transferred back to lab staff, due to the highly technical nature of the results being entered.

2.4.10 LABORATORY STAFF

2.4.10.1 Provide projected staffing description, including lead, technical, and support personnel and a plan to implement required staffing for this contract if not currently in place.

Industrial Laboratories has sufficient staff to service the Indiana contract. We have an active staff of fourteen (14) experienced drug testing specialists, who together bring you 111 years of **veterinary drug testing** knowledge.

Our staff's experience can be summarized as follows:

Name	Title	Equine Drug Testing Experience	AORC Membership	Degree Level	Work duties related to contract
Petra Hartmann	Director	33+ years	Fellow	M.Sc.	Management
Tim Krueger	Manager / Senior Chemist	17 years	Professional	BS	Operations, Data Review, R&D, Confirmation tests
Dr. Karen L'Empereur	Senior Scientist	4 years	Affiliate	Ph.D	R&D, Bisphosphonates, ITPP, TB-500 testing
Steve Cantrell	Racing Chemist	4+ years	Professional	BS	Data Review, Confirmations, R&D, Hair
Michael Oviatt	Racing Chemist	3+ years	Professional	BS	Data Review, Confirmations, R&D, Bisphosphonates, TCO2
Aaron Simonson	Racing Chemist	7+ years	Affiliate	BS	Data Review, Confirmations,
Nick Hidlay	Racing Chemist	5 years	N/A	BS	Data Review, Confirmations,
Andrea Jones	Supervisor of Screening Operations and Admin Functions	4 years	N/A	BS	Receiving, Log-in, Supply & Sample Management, Invoicing, Reports, Screening Tests
Terry Wells	Racing Analyst	20+ years	N/A	BS	Screening tests, TCO2 analysis, Customer supply management
Ashley Lewis	Racing Analyst	3 years	N/A	BS	Screening tests, TCO2 analysis, data review (screening), Hair

Christina Williams	Racing Analyst	2+ years	N/A	BS	Screening tests, TCO2 analysis, data review (screening), Hair
Curran Liao	Racing Analyst	2+ years	N/A	BS	Screening tests, TCO2 analysis, data review (screening), Hair
Ian Kassner	Racing Analyst	2+ years	N/A	BS	Screening tests, TCO2 analysis, Customer supply management, Hair
Alan Ito	Racing Analyst	5 years	N/A	BS	Screening tests
Lacey Rogers	Admin Support	1 year	N/A	BA	Admin support

2.4.10.2 Provide resumes for all personnel having any responsibility for the IHRC contract work. This must fully reflect any and all experience and expertise in the field of equine drug testing.

Short biographies of our senior and full-time staff follow. Resumes are provided as a separate attachment.
Attachment 2.4.10.2 - Resumes

Petra Hartmann
Laboratory Director

- Petra has been involved with the technical aspects of equine and canine drug testing at Industrial Laboratories for over 32 years and has served in a management capacity for over 21 years. In her capacity as Laboratory Director she is responsible for laboratory staffing, all aspects of testing, monitoring turn-around time compliance, data review, reporting, budgeting and business planning, as well as project management and client services. She additionally maintains responsibility for our quality control and quality assurance programs, including accreditation compliance. She has a **Bachelor of Arts degree in Chemistry** and a **Master of Science degree in Pharmaceutical Sciences** with an emphasis on Drug Chemistry. Petra is a **fellow member of the Association of Official Racing Chemists (AORC).** She serves as the AORC representative on the Horse Testing Laboratory Committee of the RMTC, and on the Scientific Advisory Committee of the RMTC. Petra is a Certifying Scientist for the laboratory and is experienced in and available for expert witness testimony regarding all aspects of analysis.

Tim Krueger
Senior Chemist / Lab Manager

- Tim joined Industrial Laboratories in 2003 and is employed as a Senior Chemist and Laboratory Manager. Tim performs quantitative and qualitative analysis using primarily LC-MS/MS. Tim obtained his **Bachelor of Science degree in Biology** from Jamestown College in Jamestown, North Dakota in 2003. In his role at the laboratory, Tim actively supports the continuing advancement of the lab's technical capabilities by researching and implementing new test methods, as well as troubleshooting any technical issues. He also functions as a reviewer and is available to provide client support. Tim is a **professional member of the AORC**.

Dr. Karen l'Empereur
Senior Scientist, Research & Development

- Dr. L'Empereur serves as the Senior Scientist for the Drug Testing Services department. Karen obtained her **Ph.D. in Analytical Chemistry** in 1989 from the Colorado State University in Fort Collins, Colorado. Dr. L'Empereur has a wealth of experience with state-of-the-art instrumentation procedures, such as LC-MS, LC-MS/MS, and GC-MS. Her previous experience includes drug analysis, natural products analysis, and she has extensive experience in method development and validation. In her previous professional experience, she has held positions of Quality Manager, Method Development Chemist, and Senior Research Chemist. At Industrial Laboratories she is responsible for helping us maintain our quality systems, develop new drug detection methods, troubleshoot analytical problems, act as a certifying scientist, and assist in the development of our professional staff. Karen is an affiliate member of the **AORC**.

Andrea Jones
Lab Supervisor & Administration

- Andrea joined our staff in September 2016 and fulfills a variety of functions, both in the laboratory and in an administrative capacity. She has a **Bachelor of Science degree from the University of Michigan** and is experienced in various laboratory procedures related to sample processing, chain of custody, and sample management. In her role here at the laboratory, she supervises sample receiving, extraction, storage & handling,supply management, immunoassay and TCO2 testing, reporting, and invoicing.

Steve Cantrell
Racing Chemist

- Steve joined Industrial Laboratories in 2015 as an Analytical Chemist. He has a **Bachelor of Science degree in Forensic Chemistry** with a minor in Chemistry from Pennsylvania State University. He has previous experience in drug testing as a validation and method development chemist and his primary functions include LC-MS/MS data review and confirmatory analysis. Steve is an **AORC professional** member.

Michael Oviatt
Racing Chemist

- Michael was hired in December 2016 as an Analytical Chemist. Michael has a **Bachelor's degree in Chemistry** from Metropolitan State University of Denver and has previous laboratory experience in human drug testing procedures, including extraction, confirmation, equipment and instrument maintenance, and data processing. Michael is an AORC professional member.

Aaron Simonson
Racing Chemist

• Aaron joined our team in 2013 and is employed as a Chemist in drug screening and confirmation. He has been trained in sample check-in and log-in, solid phase extraction, immunoassay testing, HPLC testing, specific gravity screening, TCO_2 analysis, LC-MS/MS screening analysis and data review, as well as selected confirmation methods. Aaron graduated from the University of Wisconsin in Madison in 2012 with a **Bachelor of Science degree in Microbiology**. He has previous experience in human drug-testing as a Laboratory Technologist. Aaron is an **affiliate** member of the **AORC**.

Nick Hidlay
Racing Chemist

• Nick joined our staff in 2015, when he was hired as an Analyst for screening analysis. Nick has been trained in all procedures related to sample receiving, processing, solid phase extraction for all LC-MS based screening analysis, immunoassay testing, and TCO2 analysis. He has received further training in routine confirmation procedures and review of screening LC-MS/MS data. Nick has previous laboratory experience with chemical extractions and laboratory documentation. He received his **Bachelor of Science degree from the University of Kansas**.

Terry Wells
Racing Analyst

- Terry joined Industrial Laboratories in 2000 and is employed as an Analyst in drug screening. His primary functions involve TCO_2 analysis and supply and inventory management. Terry graduated from Wright State University in Dayton, Ohio with a **Bachelor of Science degree in Biological Science Education**.

Ashley Lewis
Racing Analyst

- Ashley was hired in 2017 as a Screening Analyst. Ashley has been trained in all procedures related to sample receiving, processing, solid phase extraction for all LC-MS based screening analysis, immunoassay testing, Hair testing and TCO2 analysis. She is also training in data review, contraband analysis, and select confirmation tests. Ashley has previous laboratory experience with chemical extractions and laboratory documentation obtained at Colorado State labs. She received a **Bachelor of Science degree in Chemistry from Metropolitan State University of Denver**.

Christina Williams, Racing Analyst

- Christina joined Industrial Laboratories in May 2018 as a DTS Screening Analyst. She has a Bachelor of Science degree in Chemistry from Shepherd University and diverse experience in environmental labs. Christina focuses primarily on solid phase extraction and hair testing in the DTS department; however, she is also currently training in areas of irregular sample analysis and data review.

Curran Liao
Racing Analyst

Curran was hired in 2018 as a Screening Analyst. He has a Bachelors of Science degree in Biochemistry from the University of Colorado at Boulder. Curran has been trained in sample screening, hair testing, TCO2 analysis, ELISA analysis, and screening data review

Ian Kassner
Racing Analyst

- Ian joined Industrial Laboratories in 2018 as a Lab Assistant. He has a Bachelor of Science degree in Animal and Veterinary Science from the University of Wyoming. Ian has been trained in sample receiving, processing, storage, and supply logistics. Additionally, he has been trained in immunoassay testing and solid phase extraction for LC-MS based screening analysis.

Michael Sexton
Racing Analyst

- Mike recently joined Industrial Laboratories in June of 2020 as a Racing Analyst. He has a Bachelor of Science degree in Biological Sciences from the University of Maryland. Mike has been trained in all aspects of sample receiving, processing, storage, as well as immunoassay testing. His continued training will include solid phase extraction for LC-MS based screening analysis.

2.4.10.3 List the person dedicated to the proposed IHRC work along with his/her status as a member of the Association of Official Racing Chemists. Include the following as well:

a. Key contact to and from whom all communications with IHRC will take place.

Petra Hartmann – Director / Drug Testing Services (Fellow member of the AORC)
720.214.2020
phartmann@industriallabs.net

b. Laboratory technical manager/director – if different from above.

Petra Hartmann – Director / Drug Testing Services (Fellow member of the AORC)
Tim Krueger – Manager & Senior Chemist / Drug Testing Services (Professional member of the AORC)

c. Laboratory quality manager.

Joanne Compton – Director, Quality Assurance
Maria Bialecki – Quality Assurance Officer
Dr. Karen L'Empereur – Internal Blind Administration

d. Technical Staff.

Tim Krueger - Manager & Senior Chemist / Drug Testing Services (Professional member of the AORC)
Steve Cantrell – Chemist (Professional member of the AORC)
Michael Oviatt – Chemist (Professional member of the AORC)
Aaron Simonson – Chemist (Affiliate member of the AORC)
Nick Hidlay – Chemist
Andrea Jones – **Supervisor of Screening Analysis** / Administration
Ashley Lewis – Analyst
Christina Williams – Analyst
Curran Liao – Analyst
Ian Kassner – Analyst
Mike Sexton – Analyst
Terry Wells - Analyst

e. Support Staff.

Andrea Jones – Supervisor of Screening Analysis / **Administration**
Lacey Rogers **–** Administration / Lab Support

2.4.10.4 List all AORC members and their term (years) of membership.

Petra Hartmann	Fellow member	1999 Petra Hartmann currently serves as Non-Ex-Officio member on the AORC Executive Board, as well as participates in the Reference Material subcommittee and the TCO2 subcommittee of the AORC. She has also served a term as President of the Americas section.
Tim Krueger	Professional member	2011
Steve Cantrell	Professional member	2017
Michael Oviatt	Professional member	2019
Karen L'Empereur	Affiliate member	2017
Aaron Simonson	Affiliate member	2017

2.4.10.5 The scientific and support staff must include sufficient technically competent people to support the workload of the IHRC samples, along with any other contractual obligations of the laboratory within the prescribed time limits. Please indicate these staffing positions and provide their resume.

Please see section 2.4.10.2 for biographies of staff. Resumes are provided as a separate attachment.
Attachment 2.4.10.2 - Resumes

2.4.10.6 Does your company have the ability to have key laboratory personnel accessible outside of normal business hours, including weekends, holidays, and evenings which correspond to the IHRC's race schedule for the year? Please answer yes or no. If no, please explain.

Yes, we have staff that can be accessible during non-business hours, including weekends, holidays and evenings.

Key Laboratory Contacts:

Petra Hartmann (primary)	720.214.2020	phartmann@industriallabs.net
Tim Krueger	720.214.2032	tkrueger@industriallabs.net
Andrea Jones	720.214.2033	ajones@industriallabs.net

2.4.10.7 Please affirm that the laboratory will not make changes in key personnel without the approval of the IHRC.

Industrial Laboratories hereby affirms that the lab will not make changes in key personnel without the approval of the IHRC.

2.4.10.8 Provide name(s) and resume(s) of qualified personnel who would provide expert testimony upon request of the IHRC.

Our staff is available to clients for hearings that require testimony and the lab will supply data packages upon request. The Laboratory Director, **Petra Hartmann**, and the Laboratory Manager, **Tim Krueger**, provide the majority of testimony, but all of our staff members are available to testify to the work they performed on individual samples. We average testimony in 20-30 medication hearings per year, most of which is done by telephone. Our testimony has served in Steward, Commission, and Director's hearings, and has successfully withstood appeal hearing at the state appellate court level.

Petra Hartmann – Director
Tim Krueger – Manager / Senior Chemist

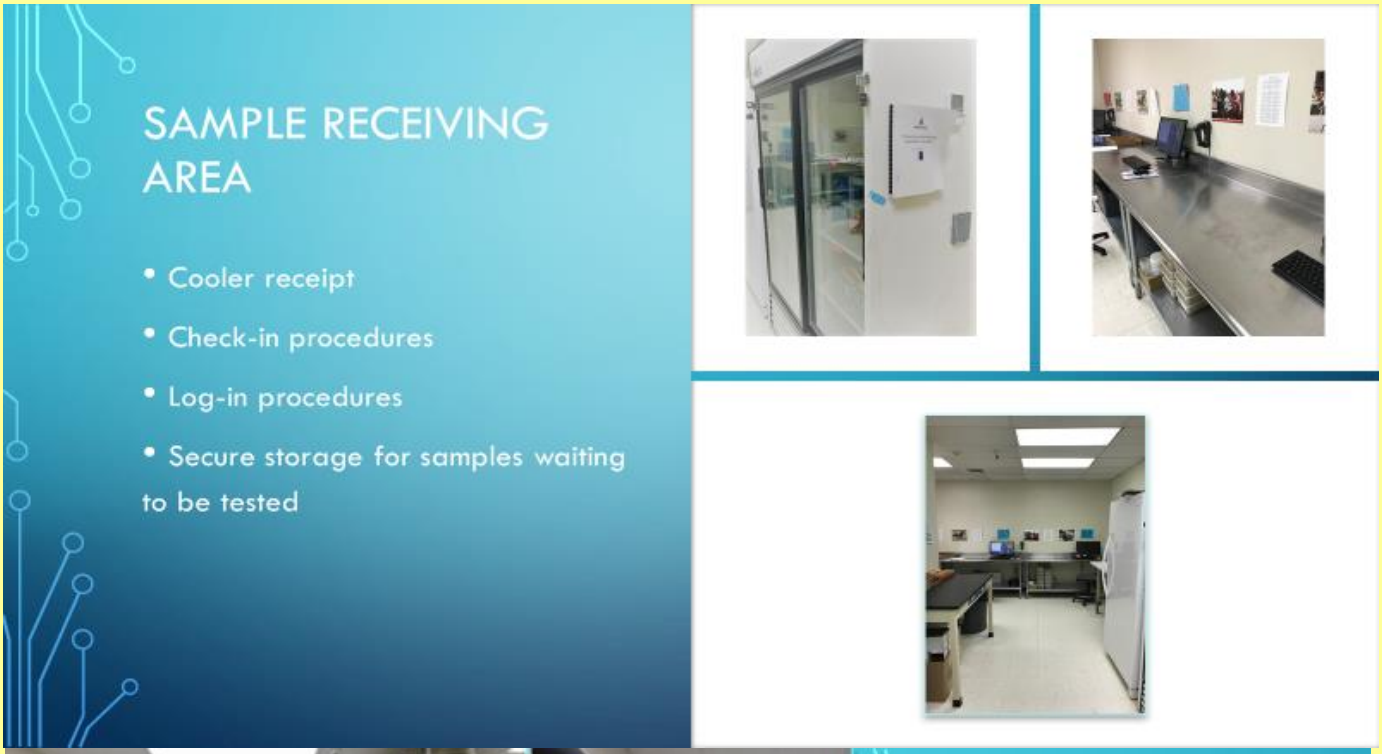
Petra and Tim's bio is provided in section 2.4.10.2 of this proposal. Full resumes are available in **Attachment 2.4.10.2 - Resumes**

2.4.11 LABORATORY FACILITIES

2.4.11.1 Describe fully the laboratory facility including the physical location and address, the total square footage of the laboratory, the date established, total number of full-time and part-time employees, and the total of areas of the laboratory to be used for work dedicated to the IHRC.

Industrial Laboratories occupies just over 13,000 square-feet of laboratory space. Of that, approximately 8,000 square feet are dedicated exclusively to the veterinary drug-testing laboratory. Our facilities are located in Wheat Ridge, Colorado, USA at 4046 and 3980 Youngfield Street. The facilities are utilized by a staff of 23 people in the Drug Testing Services Department, of which five (5) are part-time, including 2 seasonal employees. The laboratory includes more than 100 linear feet of bench space, and three fume hoods.

The facility includes areas for sample log-in, sample extraction, immunoassay (ELISA) analysis, HPLC, GC-MS, LC-MS, LC-MS/MS, office space, and sample storage. Secure sample storage is provided for both short and long-term retention of submitted samples. Additional space is utilized in other portions of the building for other uses such as long-term documentation storage, supplies and miscellaneous operations.



Industrial Laboratories utilizes several different methods to ensure that its' data and instrumentation are backed up regularly and securely. Industrial Labs backs up all data through the CrashPlan Pro backup system, a cloud-based

backup system. This ensures that whenever a change is made to a file, that file is then remotely saved with the amended change. Additionally, IL backs up data on a regular basis through a tangible hard drive that is removed from the premises to ensure the previous weeks' data is stored in a safe facility separate from our laboratory in the event of a catastrophic incident. Furthermore, Industrial Laboratories backs up all data to an additional external hard drive on a quarterly basis. Industrial Laboratories methods, sequences, and data generated are all backed up per this procedure and thus can provide immediate support and minimize service interruption in the event of a catastrophic failure. The company is secured through a 24-hour alarm system that notifies senior management in the event of catastrophic failure. Our critical equipment is available in duplicate, to provide back-up, and we maintain agreements with various vendors for emergency repair.

2.4.11.2 Describe fully the security systems routinely implemented to ensure sample integrity, chain of custody, restricted access and sample storage.

Guests of Industrial Laboratories have restricted access to the facilities. Upon arrival, visitors ring a doorbell and are granted access to the building. All visitors must sign into reception records and are always accompanied by an employee while in the facility.

Access to the Industrial Laboratories is controlled by electronic key card. Each employee is given a personalized access card that allows them entrance to the building. The access card is controlled by computer software that monitors employees entrances and exits from the building. Card permissions can be changed by the system administrator at any time to prevent access.

Industrial Laboratories Drug Testing Services' samples are controlled and secured within a fenced-in and locked perimeter area of the walk-in refrigeration unit. Only DTS staff has access to these samples. Additionally, security cameras monitor the drug sample storage facility. Positive samples are kept in locked freezers in a separately secured DTS zone. Security cameras also monitor the remainder of Industrial Laboratories' facilities. When the building is not

occupied, the Industrial Laboratories' facility is monitored by an alarm company. If the alarm is triggered, police are dispatched to the laboratory and the on-call staff member is notified.

Samples are secured by restricting access and employing locked storage facilities (both refrigerated short-term storage and frozen long-term storage). Any time a sample is accessed for testing by an approved IL employee, it is noted in the Laboratory Information Management System (LIMS). Positive samples are additionally secured with sealed evidence bags for long-term frozen storage.

2.4.11.3 List all normal business hours that the proposed work for the IHRC is to be performed.

Our company's reception area and telephones are routinely staffed Monday through Friday, from 9-5pm, MDT/MST. The company is closed annually for the following holidays:

- President's Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Day after Thanksgiving
- Christmas Eve Day
- Christmas Day
- New Year's Eve Day
- New Year's Day

2.4.11.4 Describe the secure and sample-appropriate storage space for the IHRC's official samples to maintain chain of custody and chemical integrity. Describe the storage space for testing related supplies and lockable file cabinets for confidential materials including, but not limited to, test results, documentation packets, evidentiary materials, and correspondence with the IHRC.

As previously noted, all sample storage areas are in our restricted access facilities and are additionally secured with locks on all refrigerators and freezers. All visitors are always accompanied, and work areas remain accessible only to employees. Our storage areas include:

Receiving refrigerator (temporary storage) – locked.
Walk-in refrigeration unit (short-term refrigerated storage) – keycard access with additional locked and fenced area for drug testing samples.
Freezers (short-term frozen storage) - locked and in secure warehouse area of the laboratory.
Negative 80 freezer – (long-term frozen storage) – locked and in secure warehouse area of the laboratory.
Lockable file cabinets - for client files, data, and correspondence.
Locked freezers and refrigerators - for chemicals and reference materials.
Warehouse space (restricted access) for storage of collection supplies, and non-temperature sensitive lab supplies.

2.4.11.5 Describe the laboratory space equipped with proper bench space, fume hoods, acid/base storage, flammable solvent storage and reagent storage sufficient to satisfy the State and/or Federal Occupational Safety and Health Requirements and standards set forth through ISO/IEC 17025.

Industrial Laboratories occupies 13,000 square-feet of laboratory space. Of that, approximately 8,000 square feet are dedicated exclusively to the veterinary drug-testing laboratory. The laboratory includes more than 100 linear feet of bench space, and three fume hoods. Electrical outlets are available approximately every two feet, and distilled water and sink areas are located throughout the laboratory. Our facility is compliant with OSHA and local rules for laboratories, including proper reagent storage, personal protective equipment, eye washes, emergency showers, fire extinguishers, and chemical and hazardous waste disposal protocols.

2.4.11.6 The laboratory shall have and maintain all applicable Federal and State drug and/or controlled dangerous substances licenses or permits. Please provide copies of those permits.

U.S.DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
VETERINARY SERVICES
RIVERDALE, MARYLAND 20737
file:///d:/inetpub/wwwroot/epermits/images/

UNITED STATES VETERINARY PERMIT FOR IMPORTATION AND TRANSPORTATION OF CONTROLLED MATERIALS AND ORGANISMS AND VECTORS

PERMIT NUMBER
[redacted]
Research

DATE ISSUED
04/16/2020

DATE EXPIRES
04/16/2021

NAME AND ADDRESS OF SHIPPER(S)
[redacted]
[see attached list]

CC:
Service Center, CO (Lakewood, CA)

NAME AND ADDRESS OF PERMITTEE INCLUDING ZIP CODE AND TELEPHONE NUMBER
Mr. Seth Wong
Industrial Laboratories Co., Inc
4046 Youngfield Street
Wheat Ridge, Colorado 80033
303-287-9691

U.S. PORT(S) OF ARRIVAL
AS APPLICABLE

MODE OF TRANSPORTATION ANY

AS REQUESTED IN YOUR APPLICATION, YOU ARE AUTHORIZED TO IMPORT OR TRANSPORT THE FOLLOWING MATERIALS

Blood and/or urine samples (equine origin) - for in vitro testing for blood doping control

RESTRICTIONS AND PRECAUTIONS FOR TRANSPORTING AND HANDLING MATERIALS AND ALL DERIVATIVES

THIS PERMIT IS ISSUED UNDER AUTHORITY CONTAINED IN 9 CFR CHAPTER 1, PARTS 94,95 AND 122. THE AUTHORIZED MATERIALS OR THEIR DERIVATIVES SHALL BE USED ONLY IN ACCORDANCE WITH THE RESTRICTIONS AND PRECAUTIONS SPECIFIED BELOW (ALTERATIONS OF RESTRICTIONS CAN BE MADE ONLY WHEN AUTHORIZED BY USDA, APHIS, VS).

- **Adequate safety precautions shall be maintained during shipment and handling to prevent dissemination of disease.**

- With the use of this permit I, Seth Wong, Permittee, acknowledge that the regulated material(s) will be imported/transported within the United States in accordance with the terms and conditions as are specified in the permit. The Permittee is the legal importer/recipient [as applicable] of regulated article(s) and is responsible for complying with the permit conditions. The Permittee must be at least 18 years of age and have and maintain an address in the United States that is specified on the permit; or if another legal entity, maintain an address or business office in the United States with a designated individual for service of process; and serve as the contact for the purpose of communications associated with the import, transit, or transport of the regulated article(s). **Note: Import/Permit requirements are subject to change at any time during the duration of this permit.

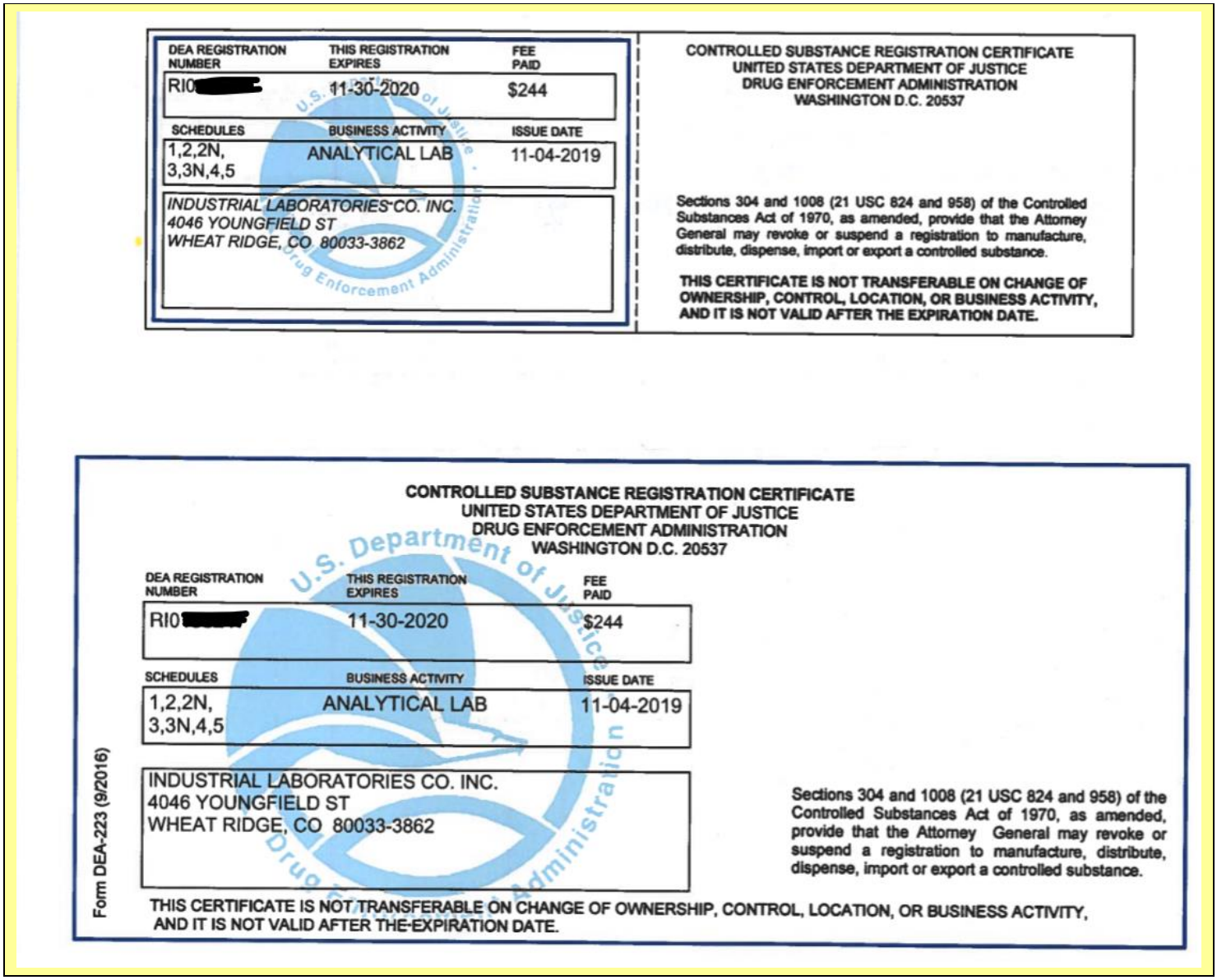
continued on subsequent page(s).....

TO EXPEDITE CLEARANCES AT THE PORT OF ENTRY, BILL OF LADING, AIRBILL OR OTHER DOCUMENTS ACCOMPANYING THE SHIPMENT SHALL BEAR THE PERMIT NUMBER

SIGNATURE David Pasnik

TITLE
Senior Staff Veterinarian
APHIS Veterinary Services

NO. LABELS



CONTROLLED SUBSTANCE REGISTRATION CERTIFICATE
UNITED STATES DEPARTMENT OF JUSTICE
DRUG ENFORCEMENT ADMINISTRATION
WASHINGTON D.C. 20537

DEA REGISTRATION NUMBER	THIS REGISTRATION EXPIRES	FEE PAID
RI0[redacted]	11-30-2020	$244

SCHEDULES	BUSINESS ACTIVITY	ISSUE DATE
1,2,2N, 3,3N,4,5	ANALYTICAL LAB	11-04-2019

INDUSTRIAL LABORATORIES CO. INC.
4046 YOUNGFIELD ST
WHEAT RIDGE, CO 80033-3862

Sections 304 and 1008 (21 USC 824 and 958) of the Controlled Substances Act of 1970, as amended, provide that the Attorney General may revoke or suspend a registration to manufacture, distribute, dispense, import or export a controlled substance.

THIS CERTIFICATE IS NOT TRANSFERABLE ON CHANGE OF OWNERSHIP, CONTROL, LOCATION, OR BUSINESS ACTIVITY, AND IT IS NOT VALID AFTER THE EXPIRATION DATE.

CONTROLLED SUBSTANCE REGISTRATION CERTIFICATE
UNITED STATES DEPARTMENT OF JUSTICE
DRUG ENFORCEMENT ADMINISTRATION
WASHINGTON D.C. 20537

DEA REGISTRATION NUMBER	THIS REGISTRATION EXPIRES	FEE PAID
RI0[redacted]	11-30-2020	$244

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Form DEA-223 (9/2016)

2.4.11.7 Please affirm that you are willing to admit any IHRC Commissioners, the Executive Director, and/or designated representative(s) to the laboratory premises for random inspection during regular business hours.

Industrial Laboratories hereby affirms that any IHRC Commissioners, IHRC Executive Director and/or designated representatives will be admitted to the laboratory premises for random inspections during regular business hours. Representatives from the IHRC must present proper identification or IHRC authorization on official letterhead.

2.4.11.8 Please affirm that in lieu of an in-person site visit, you are capable of conducting a virtual tour of the laboratory premises using Skype or an equivalent video conference tool.

We hereby affirm that we can conduct a virtual tour of the laboratory premises using video conferencing tools (Skype or similar)

2.4.12 LABORATORY EQUIPMENT

2.4.12.1 Describe fully the following instrumentation and equipment. State whether the equipment is on-site and owned wholly by the laboratory, leased, rented, or on loan. In the case of temporary assignment, state the terms of equipment availability.

All equipment is fully owned except for the following four pieces of instrumentation:
One ABSCIEX LCMS QTRAP 4500 is on lease
One ABSCIEX LCMS TOF X500R is on lease
One Perkin Elmer Head Space Gas Chromatography Mass Spec is on lease
One Perkin Elmer ICP-MS NEXIon1000

The Following is a list of equipment at the Industrial Laboratories Company.

DTS Active Equipment List

ID	IL Equipment ID	Type	Status	Manufacturer	Model Number	Serial Number
2	DTS-E-0001	Centrifuge	Active	IEC	HN-52	235512317
3	DTS-E-0002	Centrifuge	Active	International Eq	HNS	AC7870
4	DTS-E-0003	Sonicator	Active	Branson	2200	B2200R-3
5	DTS-E-0004	Vortexer	Active	Thermolyne	Maxi-Mix Plus M63215	632
6	DTS-E-0005	Oven, Blue M, Lg.	Active	General Signal	OV 480AX	O-I-352
7	DTS-E-0006	Oven	Active	Blue M	OV 480 AX	O-I-378
8	DTS-E-0007	Microplate Shaker	Active	Diagnostic Prod.	602002	035
9	DTS-E-0008	Microplate Washer	Active	Diagnostic Prod.	Milenia Mic. 4	891038
10	DTS-E-0009	Microplate Reader	Active	Opsys		
14	DTS-E-0013	Centrifuge	Active	Adams	0225	261383-SM
15	DTS-E-0014	Bag Sealer	Active	Uline		
21	DTS-E-0020	Positive Pressure Manifold	Active	UCT		
22	DTS-E-0021	Positive Pressure Manifold	Active	UCT		
25	DTS-E-0024	Turbo Vap	Active	Zymark		
26	DTS-E-0025	Turbo Vap	Active	Zymark		
27	DTS-E-0026	Package Scale	Active		LCD7004	
28	DTS-E-0027	Bar Scanner	Active	Voyager	MS9540	3502293343
29	DTS-E-0028	Vortexer	Active	Vortexer	6650	260506
30	DTS-E-0029	Dish Washer	Active	Labconco	Steamwasher	
47	DTS-E-0046	Positive Pressure Manifold	Active	Biotage		P96A131402

ID	IL Equipment ID	Type	Status	Manufacturer	Model Number	Serial Number
48	DTS-E-0047	Spe-dry 96	Active	Biotage		1373
49	DTS-E-0048	TCO2 Analyzer	Active	NOVA Biomedical	4 Plus	N04613010
50	DTS-E-0049	ELISA Plate Washer	Active	Dynex Technologies	OPSys MW	1AWA-1358
51	DTS-E-0050	Pocket Refractometer	Active	ATAGO	PAL 10S	B128140
53	DTS-E-0050	Mass Spectrometer	Active	Sciex	4500 Q-trap	BI23421406
54	DTS-E-0051	Communication Bus	Active	Shimadzu	CBM-20A	L20235255128
55	DTS-E-0052	Column Oven	Active	Shimadzu	CTO-20AC	L20215251843
56	DTS-E-0053	Pump A	Active	Shimadzu	LC-20AD/ NexeraXR	L20435252156
57	DTS-E-0054	Pump B	Active	Shimadzu	LC-20AD/ NexeraXR	L20435252174
58	DTS-E-0055	Autosampler	Active	Shimadzu	SIL-30AC/Nexera-X2	L20645250023
59	DTS-E-0056	Cooling Compartment	Active	Shimadzu		L20645250023
60	DTS-E-0057	Degasser	Active	Shimadzu	DGU-20A5R	L20705263253
61	DTS-E-0058	Valve Unit	Active	Shimadzu	FCVllAL	C20425205056CD
62	DTS-E-0059	Pocket Refractometer	Active	ATAGO	PAL 10S	G316345
63	DTS-E-0060	Degasser	Active	Shimadzu	DGU-20A5R	L20705365801
64	DTS-E-0061	Pump A	Active	Shimadzu	LC-20AD/ NexeraXR	L20265362853
65	DTS-E-0062	Pump B	Active	Shimadzu	LC-20AD/ NexeraXR	L20265363045
66	DTS-E-0063	Autosampler	Active	Shimadzu	SIL-30 AcMP	L20645350215

ID	IL Equipment ID	Type	Status	Manufacturer	Model Number	Serial Number
67	DTS-E-0064	Communication Bus	Active	Shimadzu	CBM-20A	L20235356229
68	DTS-E-0065	Column Oven	Active	Shimadzu	CTO-20-AC	L20215352588
70	DTS-E-0067	Vaccuum Pump	Active	Varian		
71	DTS-E-0068	Vaccuum Pump	Active	Varian		SV28B1 960277V1705
72	DTS-E-0069	Degasser	Active	Shimadzu	DGU-20A5R	L20705365800
73	DTS-E-0070	Degasser	Active	Shimadzu	DGU-20A5R	L203054
74	DTS-E-0071	Degasser	Active	Shimadzu	DGU-20A5R	L20705366544
75	DTS-E-0072	Pump A	Active	Shimadzu	LC-20AD/ NexeraXR	L204354
76	DTS-E-0073	Pump B	Active	Shimadzu	LC-20AD/ NexeraXR	L20435453479
77	DTS-E-0074	Autosampler	Active	Shimadzu	SIL-30 AcMP	L206454
78	DTS-E-0075	Communication Bus	Active	Shimadzu	CBM-20A	L20235356455
79	DTS-E-0076	Column Oven	Active	Shimadzu	CTO-20-AC	L20215452703
80	DTS-E-0077	Mass Spectrometer	Active	Sciex	4500 Q-trap	BI26691605
81	DTS-E-0079	Vaccuum Pump	Active	Varian		
82	DTS-E-0078	Homogenizer - Hair Mill	Active	Bertin Technologies	Precellys Evolution	300-0411
83	DTS-E-0080	Centrifuge	Active	Unico	C8724	DP1705173
84	DTS-E-0081	Centrifuge	Active	Unico	C8724	DP1705184
85	DTS-E-0082	Spe-dry 96	Active	Biotage		
86	DTS-E-0083	Degasser	Active	Shimadzu	DGU-20A 5R	L207055 96204
87	DTS-E-0084	Degasser	Active	Shimadzu	DGU-20A 5R	L207055 96202

ID	IL Equipment ID	Type	Status	Manufacturer	Model Number	Serial Number
88	DTS-E-0085	Pump A	Active	Shimadzu	Nexera X2-Lc-20AD XR	L204356 54423
89	DTS-E-0086	Pump B	Active	Shimadzu	Nexera X2-Lc-20AD XR	L204356 54421
90	DTS-E-0087	Autosampler	Active	Shimadzu	Nexera X2-SIL 30AC MP	L206455 50434
91	DTS-E-0088	Communication Bus	Active	Shimadzu	CBB-20A	L202355 57399
92	DTS-E-0089	Column Oven	Active	Shimadzu	CTO-20AC	L202155 53279
93	DTS-E-0090	Mass Spectrometer	Active	Sciex	5060084	EB220441805
94	DTS-E-0091	Degasser	Active	Shimadzu	DGU-20A 5R	L207055 96205
69	DTS-E-0066	Mass Spectrometer	Active	Sciex	4500 Q-trap	BI26091601
95	DTS-E-0092	Degasser	Active	Shimadzu	DGU-20A 5R	L207055 96203
96	DTS-E-0093	Pump A	Active	Shimadzu	Nexera X2-Lc-20AD XR	L204356 54420
97	DTS-E-0094	Pump B	Active	Shimadzu	Nexera X2-Lc-20AD XR	L204356 54422
98	DTS-E-0095	Autosampler	Active	Shimadzu	Nexera X2-SIL 30AC MP	L206455 50453
99	DTS-E-0096	Communication Bus	Active	Shimadzu	CBB-20A	L202355 57398
100	DTS-E-0097	Column Oven	Active	Shimadzu	CTO-20AC	L202155 53278
101	DTS-E-0098	Mass Spectrometer	Active	Sciex	5056246	DM2020271805
102	DTS-E-0099	Homogenizer - Hair Mill	Active	Bertin Technologies	Precellys Evolution P000062-PEVO0-A	300.1482
103	DTS-E-0100	Centrifuge	Active	Adams	420225	4160034

Current Active General Lab Equipment List Report

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Equipment Number	Department	Location	Status	System Type	Manufacturer	Model Number	Serial Number	Review or Adjustments During Calibration Cycle
BAL-001	ACD	Organic Instrument Lab	Active	Analytical Balance	Mettler Toledo	XP205	1123240849	
BAL-002	ACD	Inorganic Lab	Active	Trip Beam Balance	Ohous	2610 g Capacity	Unknown	
BAL-003	ACD	Inorganic Lab	Active	Top Loading Balance	Mettler Toledo	PG503-5	1118240663	
BAL-004	ACD	Organic Instrument Lab	Active	Analytical Balance	Sartorius	BP 210 D	70206178	
FR-006	Micro	Walk-in Cooler	Active	Freezer	Westinghouse	MFU14M2FW1	WB73100074	
FR-007	DTS	DTS Extraction Lab	Active	Freezer	Kenmore 5	564-9235012	960700138	
Hood-007	ACD	Organic Prep Lab	Active	Hood	Labconco	Unknown	000861142	
Hood-002	ACD	Instrument Lab	Active	Hood	Labconco	Unknown	Unknown	
Hood-003	Micro	Micro Zone 1	Active	Hood	Labconco Class II	Unknown	Unknown	
Hood-004	DTS	North-DTS Extraction Lab	Active	Hood	Labconco	Unknown	Unknown	
Hood-005	DTS	Middle-DTS Extraction Lab	Active	Hood	Labconco	Unknown	Unknown	
Hood-006	DTS	Sothern-DTS Extraction Lab	Active	Hood	Labconco	Unknown	Unknown	
FR-009	ACD	Organic Instrument Lab	Active	Refrigerator	Scientific Products	FSC142ABA	Z0313129563	
FR-010	DTS	Walk-in Cooler	Active	Freezer	Montgomery	4959	Unknown	
FR-011	ACD	Walk-in Cooler	Active	Freezer	Frigidaire	MFU21M3GWI	WB94826060	
FR-012	DTS	Back Lab Area	Active	Refrigerator	Glenco	RAA-42-SE	CC-284-138	

Equipment Number	Department	Location	Status	System Type	Manufacturer	Model Number	Serial Number	Review or Adjustments During Calibration Cycle
FR-014	Micro	Micro Lab Zone 1	Active	Refrigerator	Magic Chef	MCBR170W	030705452	
FR-016	DTS	Back Area	Active	Freezer	Turbo Air	M3F47-2	K3F4194073	
BAL-008	DTS	DTS 3980 - IT Room	Active	Balance	Mettler Toledo XP	XPE205	B423675411	
FR-017	DTS	Back Area	Active	Freezer	Kenmore	253.22042410	WB53255581	
FR-018	DTS	Back Area	Active	Freezer	Kenmore	253.22042410	WB53345554	
FR-019	DTS	DTS Secure Storage Area	Active	Freezer	Kenmore	253.22042410	WB62552177	
FR-020	DTS	DTS Secure Storage Area	Active	Freezer	Kenmore	253.22042410	WB62552223	
FR-022	DTS	DTS Old Breakroom Area	Active	Freezer	Frigidaire	LFFH20F3QWC	WB73063984	
FR-023	DTS	DTS Back Storage Area	Active	Freezer	Frigidaire	LFFH20F3QWC	WB71851592	
FR-024	DTS	DTS Back Storage Area	Active	Freezer	Frigidaire	LFFH20F3QWC	WB71851592	
FR-025	DTS	DTS Controlled Access Area	Active	Freezer	Kenmore	253.22042410	WB80752352	
FR-026	DTS	DTS Controlled Access Area	Active	Freezer	Kenmore	253.22042410	WB80752336	
FR-027	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB83050696	
FR-028	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB83050692	
FR-029	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB83050645	

Equipment Number	Department	Location	Status	System Type	Manufacturer	Model Number	Serial Number	Review or Adjustments During Calibration Cycle
FR-030	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB83050690	
FR-031	DTS	DTS new space at 3980 Youngfield	Active	freezer	Kenmore	253.22042411	WB90473635	
FR-032	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB90473628	
FR-033	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB90473632	
FR-034	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	253.22042411	WB90473630	
FR-035	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	25322042412	WB91971603	
FR-036	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	25322042412	WB91971887	
FR-037	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	25322042412	WB91971595	
FR-038	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	25322042412	WB91971602	
BAL-009	Microbiology	Micro Lab Zone 1	Active	Balance	Sartorius	ENTRIS3202-1SUS	37806441	
BAL-010	Microbiology	Micro Lab Zone 1	Active	Balance	Sartorius	ENTRIS2201-1SUS	37906257	

Equipment Number	Department	Location	Status	System Type	Manufacturer	Model Number	Serial Number	Review or Adjustments During Calibration Cycle
FR-039	DTS	DTS new space at 3980 Youngfield	Active	Freezer	Kenmore	111.21202910	2019W36	
FR-041	DTS	DTS- by Controlled Access Room	Active	Refrigerator	Fridgidaire	FFRU17B2QWD	WA94302081	
CENTR-001	ACD/DTS	ACD EXTRACTION ROOM	Active	centrifuge	nternational equipment Company	MP4R	24381605	
FR-042	DTS	DTS Extraction lab	Active	Freezer	Danby	DUFM059C1WDD	5019113402898	
FR-043	DTS	DTS new space at 3980 Youngfield	ACTIVE	fridge/freezer	Kenmore		MR19YE37500008	

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Calibrated Equipment List

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ID	Manufacturer	Equipment Description	ation Due Date	Status	Vendor Performed Cali	Review or Adjustments Duri
2	Troemner	Calibration Weight 400 g Weight Set ID # 007	6/8/2021	Active	Troemner	
3	Mettler Toledo	SevenCompact pH meter	12/31/2020	Active	Transcat	
4	AMSCO	Autoclave	7/30/2020	Active	TSS	
6	Mettler Toledo	Balance	9/30/2020	Active	Mettler Toledo	
7	Mettler Toledo	Balance	9/30/2020	Active	Mettler Toledo	
11	Troemner	Calibration Weight 200g Set ID #004	9/20/2020	Active	Troemner	
12	Troemner	Calibration Weight 400g Set ID #003	9/20/2020	Active	Troemner	
13	Troemner	Calibration Weight Set ID# 005	9/20/2020	Active	Troemner	
14	Troemner	Calibration Weights Set ID #001	4/21/2021	Active	Troemner	
15	N/A	Calibration Weights Set ID #002	1/10/2021	Active	Troemner	
17	N/A	Fire Extinguishers 4046 and 3980	1/17/2021	Active	Cintas	
18	N/A	Hoods	12/12/2020	Active	In-house	
19	Envirco E-735	Microbiology Hood Laminer Flow Hood	12/12/2020	Active	TSS	
24	Spectronic Instruments	UV-Vis Spectrophotometer	12/31/2020	Active	Transcat	
25	Aqua Lab	Water Activity Meter		Active	Annual calibration not needed	

ID	Manufacturer	Equipment Description	ation Due Date	Status	Vendor Performed Cali	Review or Adjustments Duri
27	Turbo Air	Turbo Air Freezer, Internal thermometer		Active	Annual calibration not needed	
28	Atago	Refractometer	3/11/2021	Active	Atago	
29	Atago	Refractometer	7/11/2020	Active	Atago	
31	BrandTech	Bottle Top Dispensor	11/30/2020	Active	Pipette.com	
32	Thomas Scientific	IR Thermometer Gun	7/13/2020	Active	Control Company	
47	Mettler Toledo	Balance	9/30/2020	Active	Mettler Toledo	
48	Troemner	Calibration Weights Set ID #008	2/28/2021	Active	Troemner	
49	VWR Scientific	pH meter	4/16/2021	Active	Transcat	
50	Troemner	Calibration Weigh 5 mg, Weight Set #009	9/17/2020	Active	Troemner	
51	Sartorius	Balance	10/22/2020	Active	Sartorius	
52	Sartorius	Balance	10/22/2020	Active	Sartorius	
53	Control Company	TIMER	3/11/2022	Active		
54	Control Company	TIMER	3/11/2022	Active		
55	Control Company	TIMER	1/31/2022	Active		
56	Control Company	TIMER	1/31/2022	Active		
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Active Pipette List

Location	ID	Serial Number	Pipette Range	Manufacturer
ACD	PI-076	PG05826	10-100 uL	Microman
ACD	PI-077	PE05251	10-1000 uL	Microman
ACD	PI-078	PE05269	50-250 uL	Microman
ACD	PI-079	18E37358	0.1mL -50 mL	‹ Electronic Repet
ACD Lab	PI-041	Z12736G	20-50 uL	Gilson-Microman
DTS	PI-080	18208268	100-1000 mcL	Microlit
DTS	PI-081	PL05513	100-1000 mcL	Microman
DTS	PI-082	PL06292	10-100 mcL	Microman
DTS	PI-083	B849863930	100-1200 mcL multichannel	Rainin Lite XLS
DTS	PI-084	J13115D	0.5-10 uL	Eppendorf
DTS	PI-085	J13253D	0.5-10 uL	Eppendorf
DTS	PI-088	19M92397	20-200 Ul	Transferpette
DTS	PI-089	20B18898	20-200 uL	Transferpette
DTS	PI-090	O59026I	120-1200 uL	Research Plus m
DTS Lab	PI-003	8509680	0.5-10 uL	Sealpette Pro
DTS Lab	PI-004	10024113	2-20 uL	Sealpette Pro
DTS Lab	PI-007	I0719D700A	20 -200 uL, Multi-channel	Rainin
DTS Lab	PI-011	742265054	100-1000 uL	VWR
DTS Lab	PI-016	636920038	1000 uL, Single Volume	VWR
DTS Lab	PI-018	I915 -139866 on ‹	10-100 uL	Eppendorf
DTS Lab	PI-033	ER27384	5-50 uL	ıpectrum Sealpett
DTS Lab	PI-037	03F05251	1-50 uL	Handy Step
DTS Lab	PI-038	03F05251	1-50 uL	Handy Step
DTS Lab	PI-039	HG28270	200-1000 uL	Gilson-Pipetman
DTS Lab	PI-043	AD15384	3-25 uL	Gilson-Microman
DTS Lab	PI-045	J1278605T	100-1200 uL	ainin-Multi-chann»
DTS Lab	PI-047	4366406	100-1000 UL	ıdorf Reapeator P
DTS lab	PI-049	59700	200-1000 uL	Finnpipeete II
DTS Lab	PI-053	4526277	100-1000 uL	ɔpendorf Referenc
DTS Lab	PI-057	G35303F	100-1000 uL	ɔpendorf Reapeat
DTS Lab	PI-058	16K59312	100-1000 uL	Transferpette

Location	ID	Serial Number	Pipette Range	Manufacturer
DTS Lab	PI-059	16J48154	20-200 uL	Transferpette
DTS Lab	PI-060	16K59325	100-1000 uL	Transferpette
DTS Lab	PI-061	896A3928	20-200 uL	VWR Brand
DTS Lab	PI-063	MB699600	100 1000 uL	Diamond Pro
DTS Lab	PI-065	LK683151	500 uL Fixed volume	Diamond Pro
DTS Lab	PI-066	18B78970	5-50uL	Transferpette
DTS Lab	PI-067	18B78969	5-50uL	Transferpette
DTS lab	PI-068	18201091	500uL	Microlit
DTS Lab	PI-071	O33560G	20-200uL	endorf Research l
DTS Lab	PI-072	O33448G	20-200uL	endorf Research l
DTS Lab R&D	PI-051	051025	10-100 uL	ppendorf Referenc
DTS Lab R&D	PI-052	4527077	100-1000 uL	ppendorf Referenc
DTS Lab R&D	PI-056	644130250	2-20 uL	ISC BioExpress
DTS Labs	PI-073	N47921G	1ul-10mL	pendorf repeater l
DTS Labs	PI-074	L48973G	1ul-10mL	pendorf repeater l
DTS Labs	PI-075	N47976G	1ul-10mL	pendorf repeater l
Micro	PI-086	K48446I	30-300	Research Plus m
Micro	PI-087	K34462i	100-1000	research plus sing
Microbiology	PI-027	4082244	100-1000 uL	Eppendorf
Microbiology	PI-034	2155695	1000 uL, Single Volume	Eppendorf

2.4.12.2 The laboratory shall have and maintain the necessary equipment in proper working order at all times, provide schedules, and documentation for routine maintenance and or calibration of the following:

A) Gas chromatograph/mass spectrometer equipped with computer data system and libraries.

Perkin-Elmer Gas Chromatography – Mass Spectrometer: Headspace capability

The instrument is covered by service contracts and maintained and verified prior to use. Scheduled maintenance occurs annually or as needed.

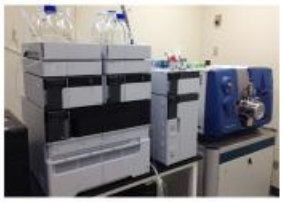
B) High performance liquid chromatograph equipped with ultra-violent absorbance, fluorescence, diode array, mass spectrometric devices and detectors.

The company has eight Agilent **high performance liquid chromatography units** in operation. These units are equipped with a variety of detector systems including fluorescence, ultraviolet absorption, and diode array. None of these units are currently used or needed for any drug testing analysis, however, they are available as back-up units, if needed. All instruments are covered by service contracts and maintained and verified prior to use. Scheduled maintenance occurs annually or as needed.

C) Liquid chromatograph/mass spectrometer.

We have four (4) **liquid chromatograph – mass spectrometers** (LC-MS/MS); all are state of the art AB Sciex Q-Trap LC-MS-MS system (Models 4500). Additionally, we have one (1) AB Sciex X-500 Q-TOF HR-MS. The instruments are exclusively dedicated to drug-testing. All instruments are covered by service contracts and maintained and verified prior to use. Scheduled maintenance occurs annually or as needed.

Liquid Chromatographs-Tandem Mass Spectrometers



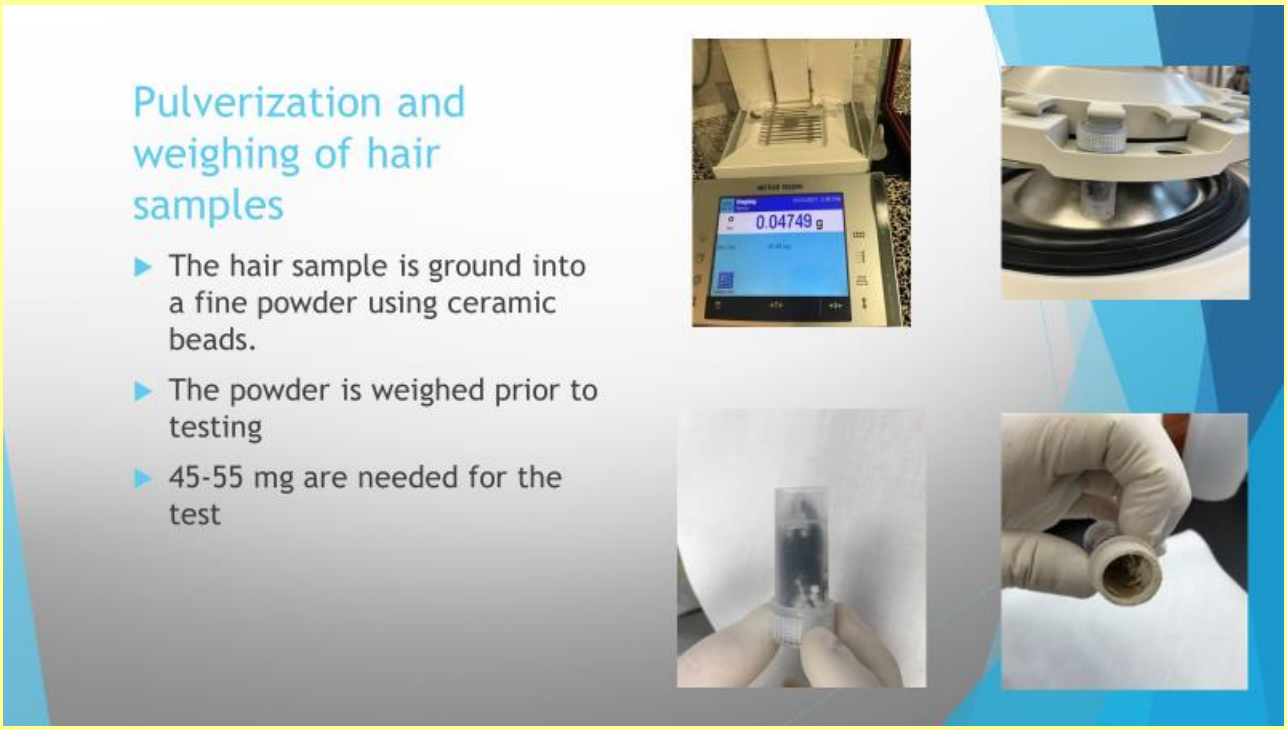
- AB Sciex 4500
- Purchase dates: 2014, 2016, 2017, 2018

D) Any additional equipment identified in the laboratory's response to this RFP.

Hair testing equipment:

Industrial Labs possesses all necessary equipment and space to conduct hair testing, including separate, exclusive hair sample preparation space, wash systems, hair grinding mill, analytical balance, and separate storage areas for hair samples.

Precellys Homogenizer for pulverization of hair samples



2.4.12.3 Provide documentation that demonstrates proficiency in the performance of the following:

A) Liquid/liquid extraction or comparable methodologies.

Liquid-Liquid extraction and solid phase extraction are the mainstays of sample preparation for most drug testing procedures. Industrial Laboratories owns all equipment and supplies needed to perform both techniques on a large volume of samples. Our proficiency is documented by the successful records of performance on internal and external quality samples (see our records of proficiency testing) and the continuous performance of drug testing contracts for 15 racing jurisdictions (see our record of positive findings over the last 5 years)

B) ELISA and/or other immunoassay techniques, which may include automated sample handling, washing, reagent
dispensing apparatus and an endpoint reading instrument.

Our ELISA equipment includes sample washers, sample shakers, and ELISA reader. We also have capabilities for heated plate incubation and manual wash options.

Dynex Opsys MR™ Microplate Reader

The Dynex Opsys MR™ Microplate Reader provides flexible assay design and extensive data reduction for most colorimetric applications. Available as a stand-alone unit or externally controlled by a PC and Windows® Revelation QuickLink, the Opsys MR™ is an affordable choice for any research or clinical laboratory.

- Comprehensive Data Reduction.
- 8 curve fit options.
- Determine sample concentration.
- Analyse mean, standard deviation and coefficient of variation.
- Multiple curves per graph.
- Threshold analysis.

Easy to Read Data Reports

The data matrix displays the well type (Test, Reference, Blank, etc), raw OD value threshold results (Positive, Negative or Equivocal), and concentration data derived from a standard curve.

ELISA Plate Reader

Dynex Opsys MW™ Microplate Washer

The Dynex Opsys MW™ Microplate Washer is an economical, full-featured 96-well microplate strip washer. An excellent choice for many laboratories because of its simplicity, ease-of-use, flexible and intuitive protocol definition, and options for 12-way (row) or 8-way (column) microplate washing for full plates or strips.

Flexibility

- The Dynex Opsys MW™ Microplate Washer provides a surprising amount of flexibility for its size and price.
- User-definable plate types and wash protocols provide significant versatility.
- You can wash whole or partial plates by row or column with interchangeable 8-way and 12-way wash heads.
- Combine prime, dispense, soak and aspirate steps in any order, defining the duration and repetition of each protocol step. Soak times can range from 1 to 999 seconds.
- Define, name, save and password-protect up to 10 microplate definitions.
- Define, name, save, copy and password protect up to 40 wash protocols.
- Control how vigorously the Dynex Opsys MW™ Microplate Washer cleans the bottom of each well by choosing the precise wash head height you need.

ELISA Plate Washer

C) Additional methodologies identified in the laboratory's response to this RFP.

None

2.4.12.4 List all additional equipment available for the performance of the proposed work for the IHRC. State whether the equipment is on-site and owned wholly by the laboratory, leased, rented, or on loan. In case of temporary assignment, state the terms of equipment availability.

Not Applicable.

2.4.12.5 List all instrumentation that is currently under a preventative maintenance service contract or agreement.

All equipment used for routine screening and confirmation is under a full-service maintenance agreement.

2.4.12.6 List all staff dedicated to the IHRC proposed work that have been trained in the operation of each piece of instrumentation and by whom the training was performed.

AB Sciex 4500 LC-MS/MS (number 1-4)

Primary instrument operators (capable of daily operation as well as troubleshooting, maintenance, and repair) – all training conducted by instrument manufacturer, AB Sciex.

Tim Krueger
Dr. Karen L'Empereur
Steve Cantrell
Michael Oviatt

Secondary instrument operators (capable of daily operation) - training conducted by primary instrument operators

Aaron Simonson
Nick Hidlay

AB Sciex Q-TOF 500 XR

Primary instrument operators (capable of daily operation as well as troubleshooting, maintenance, and repair) – all training conducted by instrument manufacturer, AB Sciex.

Dr. Karen L'Empereur
Steve Cantrell
Michael Oviatt

Secondary instrument operators (capable of daily operation) - training conducted by primary instrument operators

Tim Krueger
Ashley Lewis

2.4.12.7 List any back-up or contingency plans in case of equipment failure.

Industrial Laboratories utilizes several different methods to ensure that its' data and instrumentation are backed up regularly and securely. Industrial Labs backs up all data through the CrashPlan Pro backup system, a cloud-based backup system. This ensures that whenever a change is made to a file, that file is then remotely saved with the amended change. Additionally, IL backs up data on a regular basis through a tangible hard drive that is removed from the premises to ensure the previous weeks' data is stored in a safe facility separate from our laboratory in the event of a catastrophic incident. Furthermore, Industrial Laboratories backs up all data to an additional external hard drive on a quarterly basis. Industrial Laboratories methods, sequences, and data generated are all backed up per this procedure and thus can provide immediate support and minimize service interruption in the event of a catastrophic failure. The company is secured through a 24-hour alarm system that notifies senior management in the event of catastrophic failure. Our critical equipment is available in duplicate, to provide back-up, and we maintain agreements with various vendors for emergency repair.

2.4.13 ADDITIONAL REQUIREMENTS

2.4.13.1 Provide a listing of peer reviewed scientific publications relating to equine racing chemistry resulting from work performed in your laboratory.

Journal publications:

1. **Fast and Sensitive Chiral Analysis of Amphetamine and Cathinones in Equine Urine and Plasma using Liquid Chromatography Tandem Mass Spectrometry**

   Caroline C. Wang, Petra Hartmann-Fischbach, Tim R. Krueger, Terry L. Wells, Aaron Simonson, Alisha Lester, Nick Hidlay

   American Journal of Analytical Chemistry, Accepted for publication in 2015.

2. **Opiorphin Analysis in Equine Plasma and Urine Using Hydrophilic Interaction Liquid Chromatography Mass Spectrometry**
   Caroline C. Wang, Petra Hartmann-Fischbach, Tim R. Krueger, Terry L. Wells, Aaron Simonson, Joanne C. Compton

   Bioanalysis, Accepted for publication in 2015.

3. **Fast and Sensitive Analysis of Dermorphin and HYP6-dermorphin in Equine Plasma Using Liquid Chromatography Tandem Mass Spectrometry**
   Caroline C. Wang*, Petra Hartmann-Fischbach, Tim R. Krueger, Terry L. Wells, Amy R. Feineman and Joanne C. Compton

   Drug Test. Analysis 2014, 6, 342–349

4. **Rapid and Sensitive Analysis of 3,4-Methylenedioxypyrovalerone in Equine Plasma Using Liquid Chromatography–Tandem Mass Spectrometry**
   Caroline C. Wang*, Petra Hartmann-Fischbach, Tim R. Krueger, Terry L. Wells, Amy R. Feineman and Joanne C. Compton

   Journal of Analytical Toxicology 2012, 36, 327–333

Poster Presentations:

1. **Multiple Anabolic Steroids Screening from Various Nutritional Supplements by Liquid Chromatography Tandem Mass Spectrometry**
   Caroline Wang; Petra Hartmann-Fischbach; Timothy Krueger ; Marcia Small ; Terry Wells ; Anna Tellinger
   American Society for Mass spectrometry, 2008, Denver
2. **A Novel and Efficient Screen for Stimulants and Beta-2-Agonists from Various Nutritional Supplements by Liquid Chromatography Tandem Mass Spectrometry**
   Petra Hartmann-Fischbach; Caroline Wang; Timothy Krueger; Marcia Small; Terry Wells; Anna Tellinger
   American Society for Mass spectrometry, 2008, Denver

2.4.13.2 Describe fully all equine research projects originating in or from work in your laboratory and the funding sources within the last three (3) years.

RESEARCH

2020 (year to date)

- Cannabidiol metabolites
- Medroxyprogesterone acetate
- Headspace GC-MS for Total Carbon Dioxide
- Growth hormone -related compounds
- Sarapin markers

2019

- Bisphosphonates Drug Group
- Growth Hormone
- Growth promotants in feathers
- Levamisole
- Cannabidiol administration studies

2018

- Cardarine (GW501516) in blood and urine
- Cannabidiol in blood and urine
- Altrenogest in blood
- Albuterol and Clenbuterol stacking in blood, urine, hair
- Aminocaproic acid, carbazochrome, and ethamsylate stacking
- Andarine
- Betamethasone and dexamethasone stacking
- Fentanyl
- Fluticasone propionate
- Gabapentin
- Hexarelin
- Ligandrol
- Ostarine

- W-18
- U-47700

2017

- Dimethylsulfoxide Quantification in Blood (RMTC administration samples)
- Post administration analysis of Clenbuterol from oral swabs
- Analysis of Phenacetin and Acetaminophen in feed
- Analysis of Procaine in feed
- Analysis of Ractopamine in feed
- Sample exchange (TCO2) with another RMTC lab to aid in method validation

2016

- We sent 2 of our chemists to the hair testing workshop at UC Davis and have implemented and validated equine hair-testing for routine testing.
- We investigated the use of methylphenidate analogs.
- We participated in a research project to determine the occurrence of aminorex and pemoline findings in horses administered levamisole.
- We engaged in a corticosteroid quantitative exchange program to validate the accuracy of our method.
- We developed a method for the detection of the peptide compound TB-500.
- We also participated in a sample exchange for comparison of Total Carbon Dioxide analysis using different analyzers and sample preparation methods.

2015

- We continued our expansion of our highly sensitive target screen through the ongoing addition of new drugs of interest to the industry. New drugs added include bendroflumethiazide, benzthiazide, butabarbital, butalbital, budesonide, diflunisal, ethylphenidate, flurbiprofen, hydrochlorothiazide, modafinil acid, pentobarbital, secobarbital, trichlormethiazide, and alcofenac.
- We presented a paper titled "Fast and Sensitive Chiral Analysis of Amphetamines and Cathinones in Equine Urine and Plasma using Liquid Chromatography Mass Spectrometry" (Dr. Wang) and presentation called "Conducting a Racetrack-based Therapeutic Medication Education Program" (Petra Hartmann) at the recent 81st Annual Conference of the Association of Racing Commissioners International.
- We participated in a controlled administration study for the drug ethylphenidate, a Ritalin analog that was rumored to be in use in Quarterhorses. Our testing successfully detected the drug in both blood and urine samples, and the compound was added to routine screening analysis.
- We detected the presence of methadone and ritalinic acid in vials of euthanasia solution, following several positive findings in euthanized horses.

2014

- IL expanded our routine screening method through the addition of more than 50 drugs.
- We also developed and validated a method for the detection of opiorphin (a frog juice relative). This method, titled "***Opiorphin analysis in equine plasma and urine using hydrophilic interaction LC–MS***" has been published in the journal ***Bioanalysis***.

- We conducted method development and validation for **drug analysis in hair samples**, including screening and confirmation methods, with an emphasis on the detection of **synthetic anabolic steroids** in Out-of-Competition samples.

2013

- IL developed new methods for the following compounds:
- **ITPP** (analysis in plasma and urine)
- Hydrophilic drugs including **DMSO, GABA, aminocaproic acid** and **tranexamic acid** (using fast sample processing and LC-MS/MS)
- **Zilpaterol** (Confirmation in equine urine by LC-MS/MS)
- **Carbazochrome** (Screening and confirmation in equine urine Using LC-MS/MS)
- **Norpropoxyphene** (Confirmation in equine urine by LC-MS/MS)
- **Alfentanil** (Confirmation in equine blood and urine by LC-MS/MS)

In 2012, we were the first laboratory to detect and confirm the use of **dermorphin** (i.e. “frog juice") in Quarter Horses. We developed the test following the request of a client who encountered persistent rumors of the use of a new doping agent. After we identified the actual compound (in a syringe received for testing), we were able to refine our screening method and develop a confirmatory method. We also determined the existence of an isomer of dermorphin. We validated our method and shared it immediately with other laboratories. This approach eventually led to more than 35 positive calls for the drug in three racing jurisdictions. We presented the method at the ICRAV meeting in Philadelphia that year and submitted it for publication in the journal *Drug Testing and Analysis*. **Dermorphin** has been part of our routine screening analysis since then. We have also added related drugs to our method, including:

Dermorphin Analog
[D-arg2]dermorphin(1-4)
dermorphin analog(1-4)
b-casomorphin (1-5)
b-casomorphin(1-4) amide
Morphiceptin
b-casomorphin
b-casomorphin[Des-tyr]
Endomorphine-1
Endomorphine-2
Dermorphin
Hyp6-dermorphin

In 2011 we were the first laboratory to detect and confirm the use of **3,4- methylenedioxy pyrovalerone** (i.e. "Bath Salt") in a race horse. We subsequently published a paper of the method in the Journal of Analytical Toxicology.

In 2009, we developed a test for the detection and confirmation for **ethyl glucuronide** and **ethyl sulfate**, following reports of the use of Vodka administered pre-race. We subsequently discovered and reported at least 2 violations at one of our client's tracks.

All research projects are entirely self-funded. We have not received any funds from any organization, racing jurisdiction, contract clients, or private parties for the execution of these projects.

2.4.13.3 The IHRC has budgeted and is holding in reserve $50,000 annually for future testing needs. As the use of performance enhancing drugs in horse racing evolves, the IHRC will need technical assistance from vendor(s) to develop tests as new drugs arise. Please detail how you will assist the IHRC in developing these tests and your typical price development process. The IHRC anticipates adding blood profiles, intended to

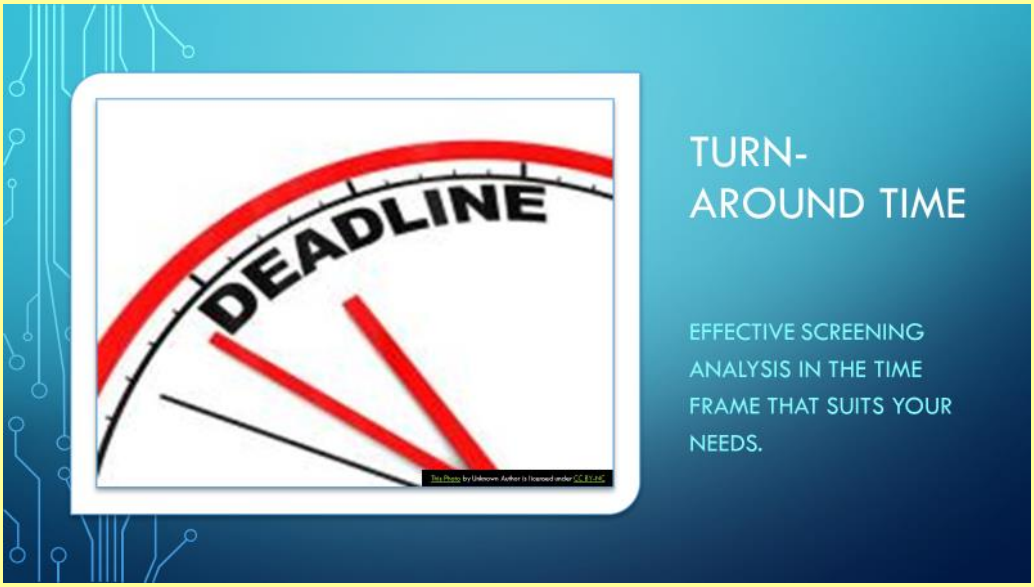
monitor equine health and organ function, to its drug testing program. Bidders should be prepared to secure a vendor capable of performing this service upon request of IHRC. The reserve money will be used to compensate the primary laboratory for this work.

Industrial Laboratories is ready to assist the Indiana Racing Commission in further developing the States doping and medication control program. The lab is specifically interested in developing blood profile capabilities that can either be employed trackside and/or in the primary laboratory. We have taken first steps in that direction with another client and are looking forward to exploring this exciting opportunity with the IHRC. Our normal development process would be conducted in close cooperation with the IHRC and includes the following general steps:

i. Define the exact objective of the test
ii. Research available literature to determine state of the art for the test objective
iii. Determine appropriate instrument and/or methodology
iv. Run trials to verify suitability
v. Implement upon successful trial completion
vi. Document and validate.
vii. Publish and/or present to industry, when appropriate

Details regarding cost estimates will depend on the exact objectives and available tools for execution, but we do not anticipate that it will be more than your available funds.

2.4.13.4 Provide confirmation that screening analyses of race day samples can be accomplished within five (5) business days of receipt of the sample. Describe circumstances, and provide examples of drugs, where additional time to confirm suspicious findings might be requested. Provide affirmation that you will notify IHRC immediately if race day samples cannot be screened within five (5) business days. Additionally, provide confirmation that confirmatory analyses can be completed within five (5) business days following an initial screening of a sample, if required by the IHRC. Provide affirmation that you will notify IHRC immediately if confirmatory analyses cannot be completed within five (5) business days following the initial screening.



Industrial Laboratories has the needed resources to complete screening analysis on all IHRC official samples within 5 business days of sample receipt. Confirmation testing of suspect samples will be completed within an additional 5 business days (10 business days total from day of sample receipt).
If the analysis cannot be completed in that time frame, we will issue a written request for extra time, detailing the reason for the delay in analysis.

Turn-around times for special testing will be quoted on an individual basis and will depend on the exact nature of the test sample and the objective of the test. We make every effort to accommodate requests for expedited testing of samples collected from Futurity and Derby trials. To help us plan for "rush" analysis, we respectfully request a calendar of special events and advance notice of expedited testing needs.

2.4.13.5 Identify the laboratory you propose to use for facilitation of testing of serum samples and for the presence of cobalt in excess of threshold levels established by IHRC rules (currently 25 parts per billion). Provide technical specifications regarding that laboratory's ability to accurately and efficiently analyze serum for the presence of cobalt. Include the per-test cost associated with each serum sample submitted for cobalt analysis, and the selected laboratory's anticipated time for providing results. Further, provide a proposed Memorandum of Understanding between the laboratory proposed for cobalt testing and your laboratory.

To ensure compliance with the 2020 TOBA/AGS Testing Protocol, IL also tests 10% of your samples for Cobalt. This service is included in the proposed routine pricing.

Cobalt testing is best performed using Inductively Coupled Plasma Mass Spectrometry (ICP-MS), a technology mainly used in the environmental field for metals testing. Industrial Laboratories has recently purchased an instrument to conduct cobalt and arsenic testing in house. Until our instrument is installed and our method has been validated, we propose to continue using the University of Kentucky, Veterinary Diagnostic Laboratory (UK VDL) for **Cobalt** and random **Arsenic** testing using validated ICP-MS procedure in place at their facility in Lexington. UK VDL has served as an official laboratory for cobalt testing for Industrial Labs for more than three (3) years. The laboratory has at least 5 years' experience in the analysis of official, pari-mutuel samples for Cobalt testing and is accredited to the standards of the American Association of Veterinary Laboratory Diagnosticians (AAVLD).

University of Kentucky Veterinary Diagnostic Laboratory
1490 Bull Lea Rd.
Lexington, KY 40511
Phone: (859) 257-8283 Fax: (859) 255-1624
http://vdl.uky.edu/LaboratoryServices.aspx
Following is an example of a test report:

UKY
University of Kentucky Veterinary Diagnostic Laboratory
1490 Bull Lea Rd.
Lexington KY 40511
Phone: (859) 257-8283 Fax: (859) 255-1624

Report Date: 6/24/2020

Final Report

Date Received: 6/19/2020 9:55 AM **Case Coordinator:** Dr. Megan C Romano, DVM, DABVT
Toxicology Section Head **Accession No:** K20009049

DR. PETRA HARTMANN
THE INDUSTRIAL LABORATORIES COMPANY, INC.
4046 YOUNGFIELD STREET
WHEAT RIDGE CO 80033

Phone: (303) 287-9691
Fax: (303) 287-0964
Email: tkrueger@industriallabs.net

Associated Parties

Other Submitter	The Industrial Laboratories Company, Inc.
Veterinarian	The Industrial Laboratories Company, Inc. Dr. Petra Hartmann

Animal Information

[20061801-013] [20061801-019] [20061811-100] [20061811-090] [20061801-009] [20061811-029] [20061811-067] [20061811-001] [20061809-001] [20061811-035] [20061811-054] [20061811-106] [20061801-022] [20061811-105] [20061811-080] [20061811-019]
Equine - Thoroughbred Qty:16

Lab Findings

Toxicology

Dr. Megan Romano, DVM, DABVT
Toxicology Section Head

Specimen	Test Name	Result
20061801-009 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 1	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	4.26 ppb
20061801-013 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 2	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	7.79 ppb
20061801-019 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 3	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	1.51 ppb
20061801-022 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 4	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	1.94 ppb
20061809-001 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 5	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	6.26 ppb
20061811-001 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 6	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	4.03 ppb
20061811-019 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 7	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	5.35 ppb
20061811-029 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 8	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	3.48 ppb
20061811-035 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 9	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	6.98 ppb
20061811-054 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 10	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	5.63 ppb
20061811-067 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 11	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	16.5 ppb
20061811-080 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 12	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	1.92 ppb

UKY
University of Kentucky Veterinary Diagnostic Laboratory
1490 Bull Lea Rd.
Lexington KY 40511
Phone: (859) 257-8283 Fax: (859) 255-1624

Specimen	Test Name	Result
20061811-090 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 13	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	3.63 ppb
20061811-100 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 14	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	5.62 ppb
20061811-105 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 15	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	16.9 ppb
20061811-106 - Mammalian - Equidae - Equine - Thoroughbred - Adult		
Serum - 16	Cobalt - Serum/Plasma - 6/24/2020 9:10 AM	25.50 ppb

Method: ICP-MS. The minimum level of quantification established for this analysis in equine serum/plasma is 1.00 ppb
.

Client Report History

Report Type	Delivery Method	Sent To	Date Sent
Final	Email	phartmann@industriallabs.net	6/24/2020 9:13 AM
Final	Email	tkrueger@industriallabs.net	6/24/2020 9:13 AM
Final	Email	ajones@industriallabs.net	6/24/2020 9:13 AM

Bulletin(s)

Please see the UKVDL holiday service/testing schedule on our web site:
http://vdl.uky.edu/HoursofOperationHolidays.aspx

Just letting our valued clients know that the UK Veterinary Diagnostic Laboratory in Lexington, KY is open for full diagnostic testing services on our normal schedule (Mon-Fri 8-5; Sat 9-5; Sun 1-5). The school and other closures related to the COVID 19 outbreak may result in reduced staffing which could delay some test results. Thanks for understanding– we stand ready to assist you!

2.4.13.6 Identify, by drug and number of called positives, all confirmed positive equine tests over the past five (5) years. The laboratory may redact information that specifically identifies clients, trainers, or horses.

CONFIRMED POSITIVE FINDINGS: 2015 TO 2019

RCI Class 1 or 2
Novel finding

	2015	2016	2017	2018	2019
Acepromazine / metabolite(s)	4	4	13	4	6
Albuterol	0	5	2	19	92
Altrenogest	0	0	0	10	12
Ambroxol	0	2	0	0	0
Aminocaproic acid	0	0	0	9	6
Aminorex	0	2	12	1	0
Amitriptyline	0	0	1	0	0
Antipyrine / metabolite	0	0	0	0	1
Apomorphine	0	0	0	0	1
Arsenic	0	0	0	3	2
Atenolol	0	1	1	0	0
Barbiturates	0	0	3	0	0
Benzocaine	0	1	0	0	0
Betamethasone	8	10	4	23	16
Boldenone	14	24	0	4	0
Bromhexine	0	0	3	0	0
Budesonide	2	0	0	1	0
Bumetanide	0	0	0	1	0
Bupivacaine	0	1	0	0	1
Butorphanol	0	0	2	2	1
Caffeine	10	9	13	15	24
Cannabidiol	0	0	0	1	6
Capromorelin	0	0	0	0	4
Carbazochrome	0	0	2	3	4
Cardarine	0	0	0	3	6
Carisoprodol	0	1	0	1	0
Carprofen	0	0	0	1	1
Celecoxib	0	1	2	1	0
Cetirizine	0	0	0	0	1
Chlorpromazine	0	1	0	0	0
Clenbuterol	40	63	127	122	274
Clodronic acid	0	0	0	0	1

Clonidine	0	0	0	0	2
Cobalt	0	0	0	4	12
Cocaine / BZE	0	0	15	3	5
Cyproheptadine	0	0	0	2	0
Dantrolene / metabolite	0	0	0	1	1
Deracoxib	0	0	0	1	0
Dermorphin	0	0	1	0	1
Detomidine	0	2	0	3	13
Dexamethasone	16	41	66	118	66
Dextrorphan	0	3	0	0	0
Diazepam / metabolite(s)	0	1	0	0	0
Diclofenac	0	6	5	3	19
Diphenhydramine	0	0	1	1	5
DMSO	4	0	3	2	0
Doxapram	0	0	0	0	1
Ephedrine	0	0	0	1	0
Etamsylate	0	0	0	1	16
Ethyl Glucuronide	0	0	1	0	0
Etodolac	0	0	0	0	1
Etorphine	0	7	1	0	0
Fenoprofen	0	0	1	0	0
Fentanyl	0	0	0	1	1
Firocoxib	0	3	4	3	0
Fludrocortisone	0	0	0	1	0
Flufenamic acid	0	0	0	1	1
Flumethasone	0	8	0	1	0
Flunixin	8	31	61	58	54
Fluphenazine	0	1	0	0	0
Flurbiprofen	0	0	1	0	0
Fluticasone	0	0	0	0	1
Formoterol	0	1	1	0	5
Furosemide	6	7	16	7	20
Gabapentin	0	1	3	9	17
Glycopyrrolate	0	3	1	5	0
Guanabenz	0	0	4	1	0
Heptaminol	0	1	0	0	0
Hydrochlorothiazide	0	1	0	2	2

Hydrocortisone succinate	14	4	2	2	0
Hydromorphone	0	0	0	0	1
Hydroxyzine	0	0	0	0	2
Ibuprofen	0	1	0	2	0
Ipratropium	0	0	1	0	0
Isoflupredone	6	2	4	9	7
Isoxsuprine	0	0	1	2	0
Ketamine	0	1	0	0	8
Ketoprofen	2	8	14	11	19
Ketorolac	0	0	1	0	0
Lamotrigine	0	1	2	2	1
Levamisole	28	10	9	8	9
Levorphanol	0	1	0	0	0
Lidocaine / metabolite	0	4	12	11	12
Ligandrol	0	0	0	0	2
Lobeline	2	0	0	0	0
Meclofenamic acid	0	1	1	0	1
Meloxicam	0	2	6	1	8
Mephentermine / Phentermine	0	5	5	1	0
Mepivacaine	6	8	8	6	5
Metandienone	4	0	0	23	1
Metaproterenol	0	0	1	0	0
Metformin	0	0	4	0	0
Methadone	6	0	0	0	0
Methamphetamine / Amphetamine	6	10	8	2	0
Methocarbamol	16	10	21	35	22
Methylphenidate / metabolite	10	8	4	1	1
Methylprednisolone	4	27	23	13	18
Methyltestosterone	0	0	0	1	1
Mitragynine	0	0	2	0	3
Modafinil	0	0	2	2	0
Morphine	0	0	1	0	1
Nalbuphine	0	1	0	1	0
Nalorphine	0	0	0	0	2
Nandrolone	0	2	0	1	2
Naproxen	0	8	13	4	8
Nikethamide / metabolite	0	7	3	0	0
Omeprazole sulfide	4	8	5	5	15

Ostarine	0	0	0	0	9
Oxazepam	0	0	0	1	0
Oxycodone	0	2	1	0	0
Oxymetazoline	0	0	1	0	0
Oxymorphone	0	0	0	0	1
Pemoline	6	5	26	2	0
Pentazocine	0	0	0	1	0
Peroxicam	0	1	0	1	0
Pethidine	2	1	0	0	0
Phenylbutazone	33	78	77	88	82
Phenytoin / metabolite	0	0	0	0	1
Prednisolone	0	2	5	0	1
Procaine	0	0	0	0	2
Propantheline	0	0	0	0	1
Propranolol	0	0	1	0	0
Pyrilamine	0	0	1	0	1
Ractopamine	2	12	5	0	8
Ranitidine	0	4	11	11	11
Reserpine	0	0	1	0	1
Romifidine	0	1	1	0	0
Sildenafil	0	3	1	1	0
Stanozolol	6	11	14	3	5
Strychnine	0	0	1	0	4
Sufentanil	0	0	0	0	1
Temazepam	0	0	0	1	0
Tenoxicam	0	0	1	0	0
Terbutaline	2	1	0	1	0
Testosterone	0	8	17	18	38
Theobromine	0	0	4	2	9
Theophylline	0	0	5	10	3
Tiludronic acid	0	0	0	0	3
Tolfenamic acid	0	0	1	0	0
Topiramate	0	0	1	0	0
Tramadol / metabolite	0	0	4	0	0
Tranexamic acid	0	0	0	0	1
Trenbolone	0	0	0	1	1
Triamcinolone acetonide	4	11	21	13	14
Valerenic acid	0	0	2	1	0

Velafaxine / metabolite	0	0	0	1	4
Xylazine	12	10	5	2	8
Yohimbine	4	0	0	2	0
Zilpaterol	0	8	10	3	26
α-PVP	0	0	0	0	2
Total # per year	**291**	**529**	**740**	**759**	**1088**

2.4.13.7 Provide information relating to any efforts made in the past to educate horsemen about testing and responsible use of permitted medications. The laboratory shall also provide a plan for educational efforts directed toward Indiana horsemen if the lab is awarded the Indiana contract.

Industrial Laboratories has been offering a **free research program** for samples collected after known administration of therapeutic medications regulated by threshold. This program serves trainers and horsemen as a learning tool to monitor withdrawal times. Through this program we have significantly reduced inadvertent therapeutic medication violations, which means less frustration on the track from all participants, as well as decreased administrative burden on the commission and staff. The program has been well received by horsemen and veterinary racetrack practitioners. To qualify as no-charge research samples, the following conditions must apply:

The Indiana Horse Racing Commission is aware of the submission and has given its approval.
The drug to be tested is a therapeutic medication that is regulated by threshold in Indiana, or is otherwise approved for testing by the Commission
The administration specifics must be made available to the lab (exact drug name, dose given, route of administration, date/time of administration, specific joints injected in the case of intra-articular administration, and date/time of sample collection).
The submitter agrees that administration and resultant drug level information will be shared with other industry participants, anonymously.

The success of this program has found much interest in other jurisdictions and IL often receive inquiries about the protocols. Industrial Laboratories shares information from this study anonymously with the RMTC and other clients of Industrial Labs.

2.4.14 SUGGESTED ADDITIONAL INFORMATION

2.4.14.1 The IHRC intends to form a partnership with the chosen laboratory to remain at the cutting edge of testing and sanctioning illegal or illicit drug use in horse racing in Indiana. As such, the IHRC strongly suggests that the bidders provide a list of substances/drugs for which the laboratory has the capability to test. Additionally, bidders should provide IHRC with the total number of substances/drugs that are screened for in each test. Understanding the proprietary nature of the above information, and the need for the information to be protected from potential bad actors in the horse racing industry, the IHRC is prepared to treat the above as confidential and proprietary if the bidder follows the instructions included for confidential information in this RFP. Bidders that decline to provide the above information should provide a detailed description of why that choice was made.

Industrial Laboratories respectfully declines to provide the requested information related to the full scope of testing as part of this proposal, out of deep concern for the integrity of the doping control process and how this process would be compromised if this information inadvertently became accessible to the wrong parties. However, we do understand your desire to know this information and are prepared to invite two (2) representatives of the IHRC to visit our facility **at our expense**, to review the drug scope information and view our proprietary and confidential standard operating procedures.